

Owner's Handbook

AMORPHIUM™

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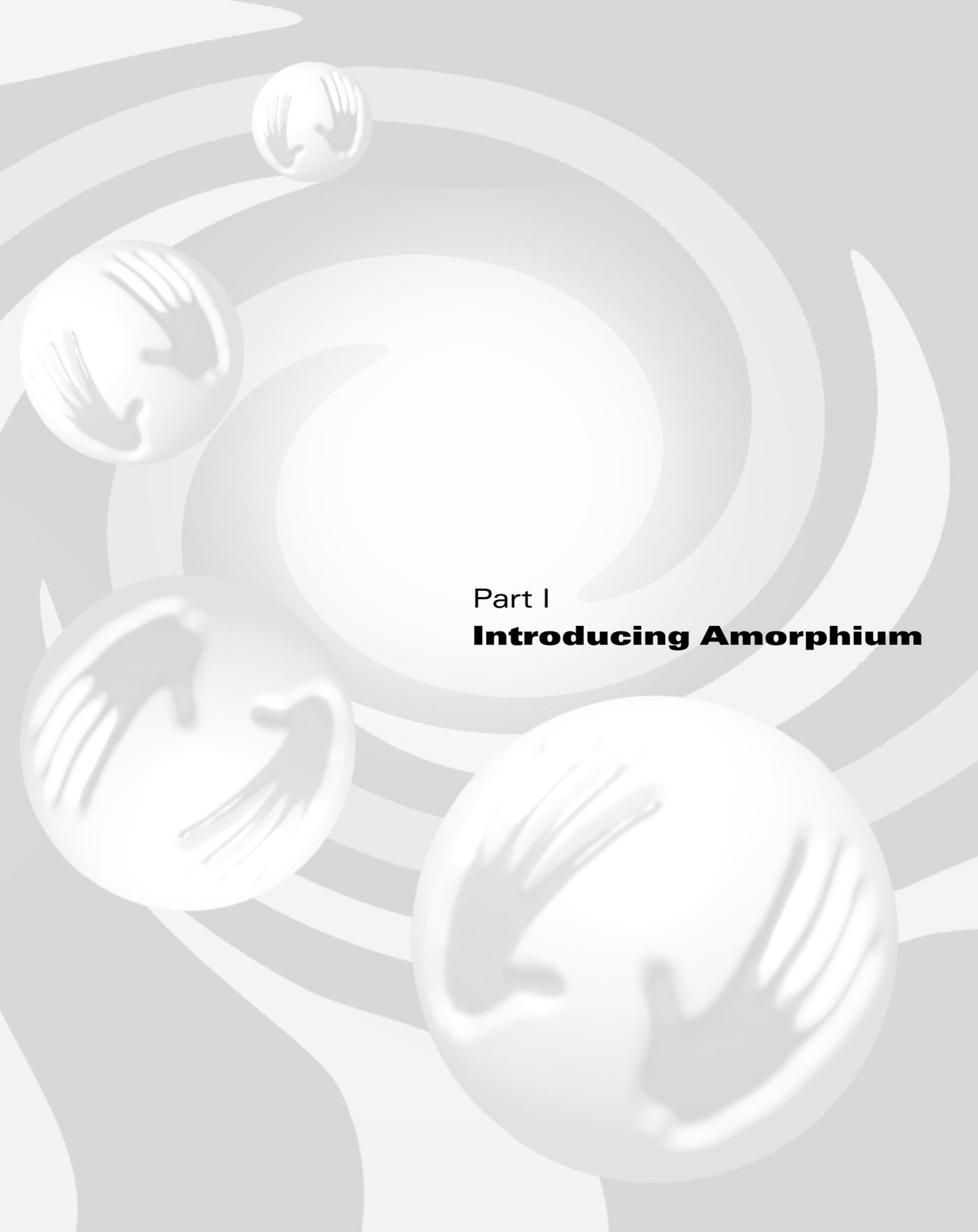
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The background features a series of concentric, overlapping circles in various shades of gray, creating a sense of depth and movement. Scattered throughout the scene are several spheres of varying sizes, each with a white, hand-like pattern on its surface. The overall aesthetic is clean, modern, and abstract.

Part I

Introducing Amorphium

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Chapter 1: What is Amorphium?

1.1 Introduction

Amorphium is the world's first real-time 3D sculpting and painting tool for personal computers. It introduces a totally new way to create compelling 3D graphics—by enabling users to interactively sculpt and paint shaded 3D objects in real-time. It was designed to allow anyone to create custom 3D graphics for web sites, desktop publishing, business graphics, art education and personal creative projects.

Electric Image's Universe animation software is well known throughout Hollywood for its visual effects magic in Blockbuster movies like Jurassic Park, Star Wars Special Edition, Men in Black, Titanic and Terminator 2. For the first time, Amorphium brings this level of sophisticated 3D graphics to anyone with a passion for cool graphics, from school kids to graphic artists, from web developers to professional animators.

1.2 How Does Amorphium Work?

Amorphium's approach enables users to shape objects with a variety of tools by 'pushing' and 'pulling' on different parts of the object, much as you would to shape a lump of clay. You can push, pull, twist, morph and paint easily and interactively. And when you apply these distortions, you'll see the changes take effect in real-time! Amorphium is the first tool in history to bring this kind of graphics power to personal computers, and it doesn't require expensive graphics accelerator cards to do its magic.

How is this possible? At the heart of Amorphium is a highly optimized software engine capable of real-time 3D rendering. Our design team hand-coded Amorphium from scratch to enable this capability. This breakthrough technology enables 3D modeling techniques that would be difficult or impossible in traditional 3D modeling tools—even with specialty 3D systems costing thousands of dollars running on professional graphics workstations.

Amorphium's approach eliminates the slow and difficult wireframe editing process associated with existing 3D systems. Tasks that took painstaking hours with polygon, spline or NURBS-based modeling tools can be done in literally seconds using Amorphium. We also simplified the complex 3D user interface, which often baffled 3D newcomers. To this end, creating shapes in Amorphium is more like sculpting with clay than working with graph paper;

painting objects is more like working with a brush than working with math equations. Amorphium's tools emulate real world objects and are easily accessible with only a few clicks of the mouse.

1.3 Who Should Use Amorphium?

Amorphium also provides a natural step between programs such as Adobe Photoshop, and 3D graphics systems. Graphic artists can create sophisticated 3D objects or compose an entire scene in Amorphium and save it as a 2D image file (TIF, JPG, BMP, GIF, PICT, PNG, MOV) at any size up to film resolution. Web developers can easily create custom 3D logos, banners, buttons, animated GIFs and VRML files.

For the 3D professional, Amorphium fits right in as a new application, providing a multitude of unique organic sculpting and painting tools. Amorphium also solves a common problem with computer graphics—perfection. Amorphium adds realistic imperfection, by importing FACT, 3DS, LWO and OBJ formats, adding scratches, wrinkles, creases, scorch marks, dings and dents directly to the surface of an object. It also features a smoothing tool to quickly fix polygonal 'tears' and jaggedness on an object, which would have required a lengthy process of aligning vertices in existing wireframe 3D modelers.

Chapter 2: Installing Amorphium

2.1 On the PC

Before you try to use Amorphium, you'll have to install it on your hard drive. First, let's cover the system requirements for your PC. Remember, these requirements are the minimum to run Amorphium. If you have more than these minimums, so much the better!

System Requirements

- Windows 95/98, or NT 4.0
- 133MHz Pentium Processor
- 32MB RAM
- CD-ROM Drive
- 10 to 189MB Free Space on Hard Drive
- 800x600 Pixel Display with 16-bit (65536) Colors.

Begin Installation

To begin the software installation process, we must open the Amorphium installation program.

- Start your PC as normal, and enter Windows.
- Insert the **Amorphium CD-ROM** into your CD-ROM drive.
- Double-click the **My Computer** icon on your Windows desktop.

This will open a window showing your computer's drives.

- Double-click the **CD-ROM** drive.

The icon for the CD-ROM drive will show a drive with a CD in front of it. Once you've double-clicked it, a new window will appear showing the contents of the Amorphium CD-ROM.

- Double-click on **Setup**.

You will then see the Amorphium Installation program on the Windows desktop. The Installation Program will warn you to exit all other Windows programs before continuing.

Choosing a Folder

Once you have closed any other open programs, and clicked **Next**, you will be given the opportunity to create a folder on your hard drive for Amorphium.

By default, Amorphium will be installed in the **Program Files\Electric Image\Amorphium** folder of your C: drive. If you would prefer to install Amorphium on a different drive and/or folder,

- Click the **Browse** button and choose the new installation folder, and click the **Next** button.

At this point, you can choose the **Typical**, **Compact** or **Custom** Installation options.

If you want Amorphium to be installed with all additional content:

- Leave the **Typical** button selected, then click **Next** to begin the installation.

If you would rather choose which optional components to install,

- Click the **Custom** button, then click **Next**.

Custom
Installation

Following is a list of the optional components and the amount of space they will occupy on the hard drive:

Component	Size
Tutorial Files	18124 KB
Background Images	11775 KB
Biosphere Samples	186 KB
Example Images and Movies	17103 KB
Additional TrueType fonts	1320 KB
HeightShop Images	16604 KB
Object Samples	42983 KB
Imported Object Samples	11944 KB
Project Samples	37493 KB
Task Samples	1096 KB
Texture Images	14135 KB

- Click the box next to each component to deselect it.

A check mark will appear in the boxes next to the components that will be installed.

When you have finished selecting the components to be installed,

- Click **Next** to begin the installation.

Compact
Installation

If you only want to install the Amorphium program files, with no additional content,

- Click the **Compact** button, then click **Next**.

Need More
Space?

You can use Windows Explorer to search your hard drive for files that you no longer need. You should also empty your **Recycle Bin** at this time. If that doesn't work, you might also consider the option of purchasing another hard drive. Storage is cheap, and it's definitely worth it to find a way to install the extra content!

Finishing Up

Once you have chosen an installation method and clicked **Next**, the installation program will now spend some time talking to your hard drive, which will chatter back in a good-natured way. This conversation is on a timer, though. When the installation program and hard drive have finished exchanging pleasantries, the installation is complete.

Desktop
Shortcut

After the Amorphium Files have been installed, you will be asked if you would like a shortcut to the Amorphium program added to your desktop. Adding a shortcut to the Windows Desktop means that you will be able to access Amorphium more quickly, but if you don't like shortcuts on your desktop, you can just say No and use the Start menu to launch Amorphium.

Installing
QuickTime 3.0

When you've decided whether you want a desktop shortcut, you'll be asked if you want to install QuickTime 4.0. Amorphium needs this for some features, so we highly recommend that you install it if you don't already have it on your PC.

Starting
Amorphium

Once you've finished installing everything, you're ready to go! You can start Amorphium by clicking on the Amorphium icon on the Windows Desktop, if you chose to have one added, or open it from the Start/Programs/Electric Image folder.

2.2 On the Mac

Before you use Amorphium, you'll have to install it on your hard drive. First, let's cover the system requirements for your Mac. Remember, these requirements are the minimum to run Amorphium. If you have more than these minimums, so much the better!

System Requirements

- System 8.0 or Newer
- PowerMac, Mac G3 or iMac
- 32MB RAM
- CD-ROM Drive
- 10 to 189MB Free Space on Hard Drive
- 800x600 Pixel Display with Thousands of Colors.

Begin Installation

To begin the software installation process, we must open the Amorphium installation program.

- Start your Mac.
- Insert the **Amorphium CD-ROM** into your CD-ROM drive.
- Double-click the **Amorphium CD-ROM** icon which appears on your desktop.

This will open a folder showing the contents of the Amorphium CD-ROM.

- Double-click the **Installer** icon.

You will then see the Amorphium Installation program on the desktop. The Installation Program will warn you that it will close all other running programs before proceeding.

Choosing a Folder

At this point, you will be given the opportunity to create a folder on your hard drive for Amorphium. By default, Amorphium will be installed in the **Amorphium** folder of your **Macintosh HD**. If you would prefer to install Amorphium on a different drive and/or folder,

- Click the **Browse** button and choose the new installation folder, and click the **Next** button.

At this point, you can choose the **Typical**, **Compact** or **Custom** Installation options.

If you want Amorphium to be installed with all additional content:

- Leave the **Typical** button selected, then click **Next** to begin the installation.

Custom
Installation

If you would rather choose which optional components to install,

- Click the **Custom** button, then click **Next**.

Following is a list of the optional components and the amount of space they will occupy on the hard drive:

Component	Size
Tutorial Files	18124 KB
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Additional TrueType fonts	1320 KB
HeightShop Images	16604 KB
Object Samples	42983 KB
Imported Object Samples	11944 KB
Project Samples	37493 KB
Task Samples	1096 KB
Texture Images	14135 KB

- Click the box next to each component to deselect it.

A check mark will appear in the boxes next to the components that will be installed.

When you have finished selecting the components to be installed,

- Click **Next** to begin the installation.
- Compact Installation
- If you only want to install the Amorphium program files, with no additional content,
- Click the **Compact** button, then click **Next**.
- Need More Space?
- If you find yourself a little short on hard drive space, you should empty the **Trash**. That alone might open up enough space, but if it doesn't, you might look for old programs or data files which you no longer need, and put them in the Trash as well (don't forget to empty it again!).
- If that doesn't work, you might also consider the option of purchasing another hard drive. Storage amazingly is cheap these days, and it's definitely worth it to find a way to install the Amorphium content!
- Finishing Up
- Once you have chosen an installation method and clicked **Next**, the installation program will now spend some time talking to your hard drive, which will chatter back in a good-natured way. This conversation is on a timer, though. When the installation program and hard drive have finished exchanging pleasantries, the installation is complete.
- Installing QuickTime 3.0
- After the Amorphium program files have been installed, you will be asked if you want to install QuickTime 4.0. QuickTime version 3.0 or later is required for Amorphium to work properly, so unless you already have version 3.0 or later on your Mac, you must install it before you use Amorphium!
- Starting Amorphium
- You can start Amorphium by clicking on the Amorphium icon on the Desktop, if you chose to have one added, or open it from the Amorphium folder on the Macintosh HD, or wherever you had it installed.

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Chapter 3: Amorphium Tour

3.1 Introduction

Now that you've installed Amorphium, you're probably wondering what you can do with it. We suggest you take it for a test drive. But don't just drive around the block, take it off road. Dent the fenders, scratch the paint, kick the tires, and change the radio station. We don't care how banged up it gets. The next time, and every time you put the key in the ignition, Amorphium will be back in one piece, washed, waxed, and ready to go on another adventure.

3.2 Workspace and Object Basics

Amorphium starts up with the **Tools&Distorts** tools—Amorphium's sculpting tools—visible, and a sphere in the 3D workspace (*figure 3.1*) ready for you to work with.

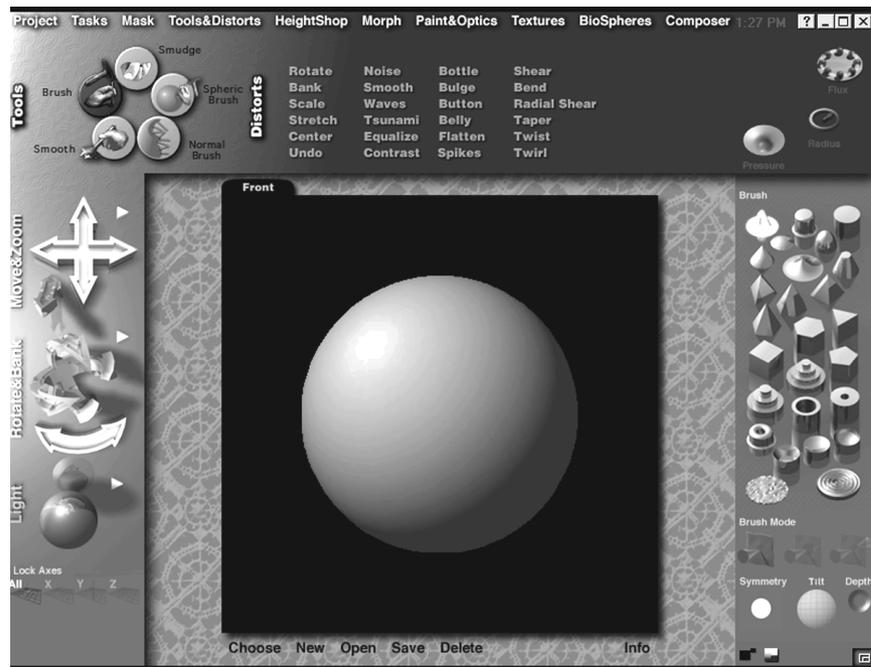


figure 3.1: The Amorphium Interface with a Sphere in the 3D Workspace

At the top of the screen, you will find 10 buttons giving you access to nine different sets of tools and the Project menu (figure 3.2).



figure 3.2: Buttons for Amorphium's Nine Sets of Tools

- But before you hit the road, click the **Project** button to bring up the **Project** menu (figure 3.3).

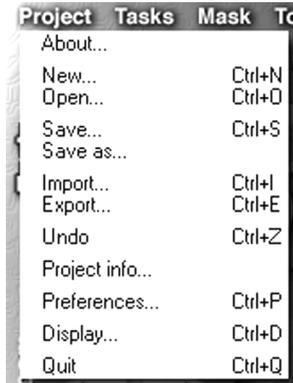


figure 3.3: The Project Menu

Please Experiment!

Amorphium is a program that gives you an incredible amount of freedom to experiment—there is no one right way to do things. The projects and objects we have presented here could be done in many other ways.

Undo

As you use Amorphium, you may decide that something you tried is a mistake. That may or may not be the case—mistakes often lead to new and amazing creations—but you can always **Undo** your last operation by pressing **Ctrl-z** (**Apple Key-z** on the **Mac**). We've highlighted this important feature for you so you need never hold back while you learn and experiment with Amorphium.

Creating an Object

One of the first things you'll want to do is to open a new object. Amorphium makes this easy—below the 3D workspace you'll find buttons that give you access to menus for managing objects (*figure 3.4*).



figure 3.4: The 3D Workspace and Object Menus

- Click **New** open the **New Object** menu (*figure 3.5*).

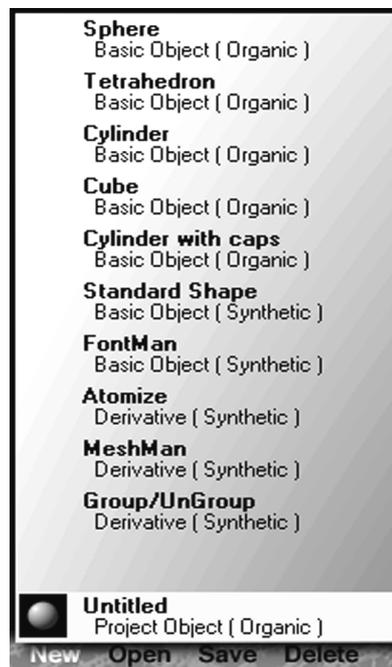


figure 3.5: The New Object Menu

On this menu you will find choices for several different shapes which have been created for you, and other choices that will allow you to create a custom object. For now, we'll stick with the pre-fab objects.

- Select **Tetrahedron** from the menu then release the mouse button.

You should now see a tetrahedron, or pyramid in the 3D workspace (*figure 3.6*).

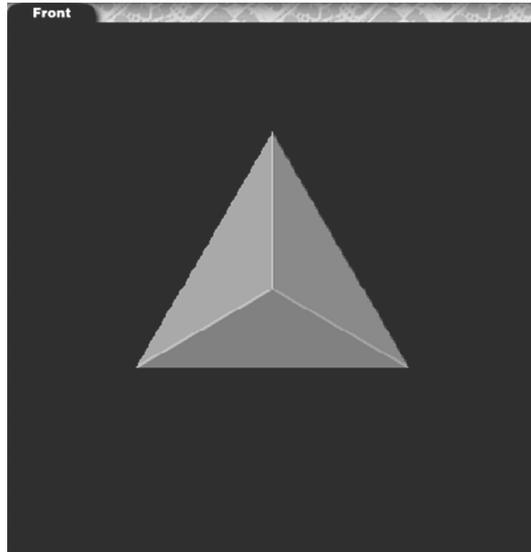


figure 3.6: A Tetrahedron in the 3D Workspace

This is fun and easy, having premade shapes to start with. Just for practice, let's open one more object:

- Select **Cube** from the **New** menu then release the mouse button.

You should now see a cube in the 3D workspace (*figure 3.7*).

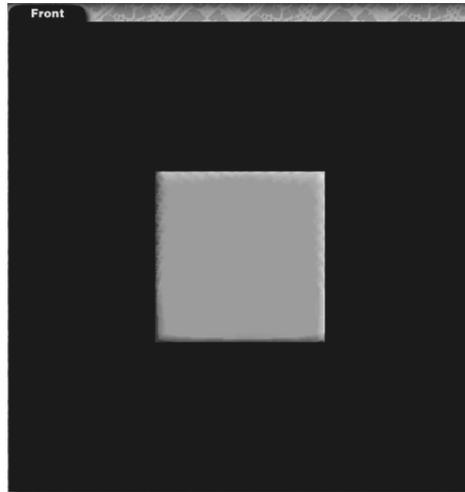


figure 3.7: A Cube in the 3D Workspace

Ok, we've got the hang of getting objects into the 3D workspace, so let's see how we can pick between them.

Choosing Objects

If you remember, when Amorphium started, there was a **Sphere** in the 3D workspace. If you have been following along, and have loaded the **Tetrahedron**, then **Cube**, you can't see the **Sphere** or **Tetrahedron** anymore. Where did they go?

They're hanging around offstage, waiting for your summons. The way you can summon them—as well as any other objects you have loaded is with the **Choose** menu (*figure 3.8*).

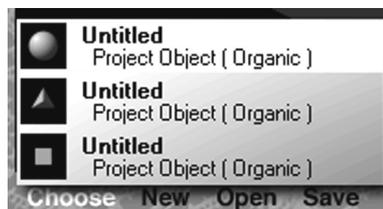


figure 3.8: The Choose Menu

All the objects you have loaded will appear here. Let's go back to the **Tetrahedron**.

- Click the **Choose** button.

This opens the **Choose Object** (*figure 3.8*) menu.

- Highlight the **Tetrahedron** by moving the pointer over it, then release the mouse button.

The object you selected will appear in the 3D workspace

Moving and Zooming

On the left side of the screen, you'll notice several controls. These controls allow you to control the object and the view. The first of the tools are the **Move&Zoom** tools (*figure 3.9*).



figure 3.9: The Move and Zoom Tools

These tools change the object's position in the 3D workspace.

- Place the pointer over the **Move** tool (the plus sign with arrows), and click and drag the mouse.

Observe how the object moves around as you drag the mouse.

Rotating and Banking

The next of the tools are the **Rotate&Bank** tools (*figure 3.10*).

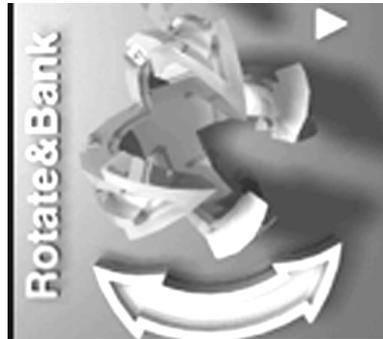


figure 3.10: The Rotate&Bank Tools

These tools change the object's orientation in the 3D workspace, making it tumble or spin like a top, depending on how you move the mouse.

- Place the pointer over the **Rotate** tool , and click and drag the mouse.

Observe how the cube rotates as you drag the mouse left and right, versus how it moves as you drag the mouse up and down. The **Rotate** tool causes rotation around the **x** and **y** axis.

- Place the pointer over the **Bank** tool , and click and drag the mouse.

Notice how **Bank** differs from **Rotate**—banking occurs around the **z** axis.

Lighting

3D objects are very boring without any light to see them by, so Amorphium provides you with a light and the tools to control it with (*figure 3.11*).

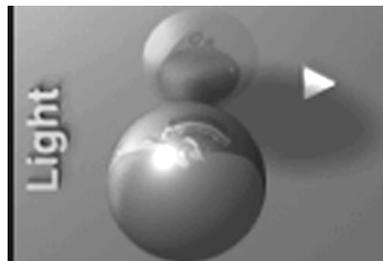


figure 3.11: Amorphium's Light Tool

Go ahead and move the light, to get a feel for how it affects the object.

- Place the pointer over the **Light** tool , and click and drag the mouse.

Notice how shadows and highlights change as you move the light. If you look at the **Light** tool itself, you'll see a highlight there—this is a good way to tell just where the light is positioned.

3.3 Brushes and Brush Tools

Now that we've covered opening objects and moving them around, it's time to play with some of the really fun stuff—Amorphium's **Tools** and **Distorts**.

Amorphium gives lots of great tools to help you create 3D sculptures—the tools that allow you to do this are the **Brushes** themselves (*figure 3.12*), *Brush Modifiers* (*figure 3.13*) and the **Brush Tools** (*figure 3.14*).



figure 3.12: Amorphium's Brushes

Amorphium has 26 brushes in all kinds of shapes, which are themselves modified by the **Brush Modifiers** (figure 3.13).



figure 3.13: The Pressure and Radius Brush Modifiers

Once you have a **Brush Shape** and have set the **Brush Modifiers**, the last step is to pick one of the **Brush Tools** (figure 3.14).

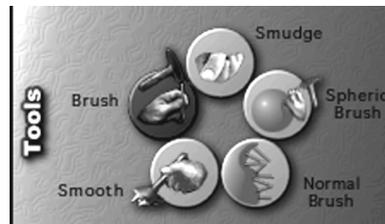


figure 3.14: Amorphium's Brush Tools

These tools work together in a very simple way:

- The **Brush** provides the shape.
- The **Brush Modifiers** determines the **Radius** (size) of the shape, and the amount and direction of **Pressure** it will exert.
- The **Brush Tool** describes how that shape will be applied to the object.

The best way to see what all this means is to start carving one of the objects!

Let's start with the **Sphere**.

- Click the **Choose** button below the 3D workspace, then select the **Sphere** you created earlier.

We'll stick with Amorphium's default brush for now, and leave the Pressure and Radius settings alone as well.

- Move the pointer over the 3D workspace, then click and hold the mouse button and drag the pointer across the **Sphere**.

You should see a line carved into the sphere something like that in *figure 3.15*.

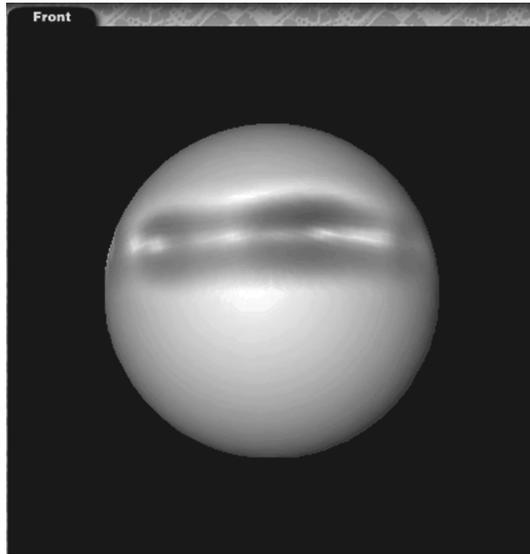


figure 3.15: Carving a Line in the Sphere

Let's try dragging the brush across the Sphere very slowly this time.

- Press **Ctrl-z** (**Apple Key-z** on the Mac) to Undo the last stroke and return the Sphere to its original condition.
- Drag the pointer across the Sphere again, but this time move it very slowly.

Notice how much more deeply the brush cuts into the Sphere this time (*figure 3.16*).

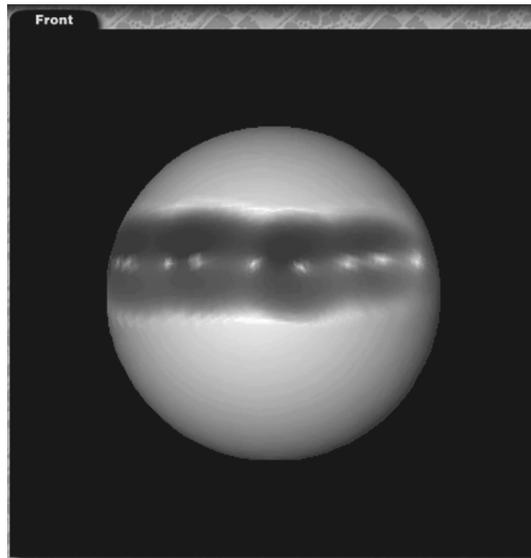


figure 3.16: Carving a Deeper Line into the Sphere

Let's get a look at what we've done from a slightly different angle. We'll rotate the Sphere, but first, we'll use the **Lock Axis** feature to restrict how the Sphere moves.

Click on the **Y** button of the **Lock Axes** tools (*figure 3.17*).



figure 3.17: The Lock Axes Tools

Selecting to lock Rotation to the Y axis only will cause the sphere to spin as if attached to a line running from the top of the screen to the bottom.

- Click the **Rotate** tool and spin the Sphere about **90°** to the right.

Note how the slow stroke you drew across the Sphere pushed it straight back away from your view (*figure 3.18*).

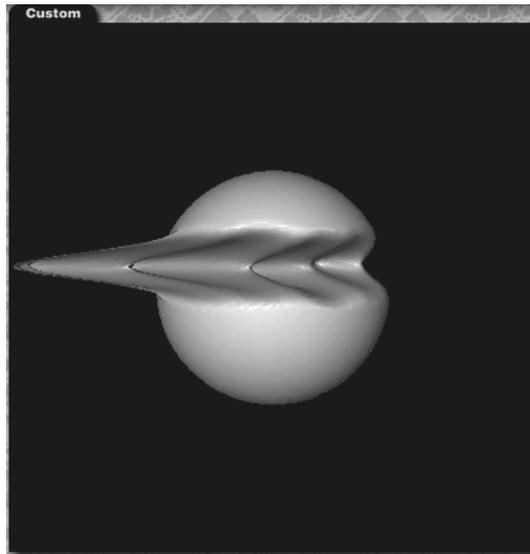


figure 3.18: Side View of the Sphere

Hmmm. Not particularly pretty. The stroke pushed straight back on the Sphere because we were using the default **Brush** Tool. We can certainly do something about this by using another of the Brush Tools—**Spheric Brush**.

First, however, let's toss this mangled Sphere.

- Click the **Delete** button below the 3D workspace.
- Click the **New** button, then select **Sphere**.

That starts us out with a fresh Sphere.

Click the **Spheric Brush** button (*figure 3.19*).

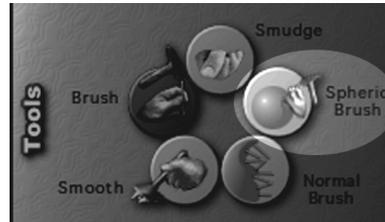


figure 3.19: The Spheric Brush Button

- Drag the pointer across the **Sphere**.
- Rotate the **Sphere** again (with the **Lock Axes** tool set to **Y** still).

Notice that this time, the stroke you dragged across the Sphere carved into the center of the Sphere (*figure 3.20*).

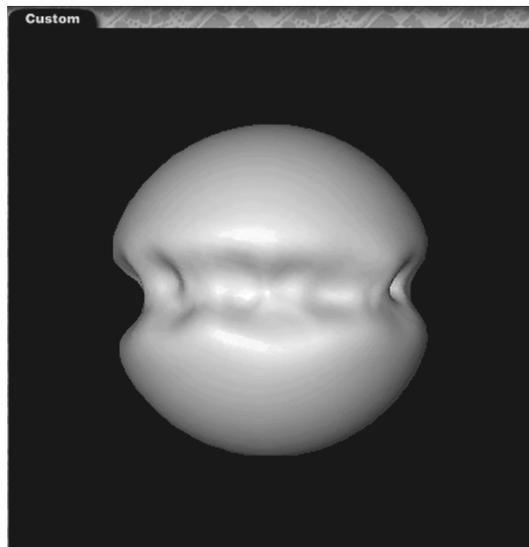


figure 3.20: Carving with the Smooth Brush

See how different the sphere appears this time. **Spheric Brush** carves towards the center of the object, and **Brush** carves straight across the surface visible on the screen.

Let's try another Brush Tool.

- Click the **Smooth** Brush Tool.
- Click and drag the pointer back and forth across the Sphere over where you made your previous stroke.

Notice that the **Smooth** Brush Tool has the effect of smoothing out the previous stroke (*figure 3.21*).

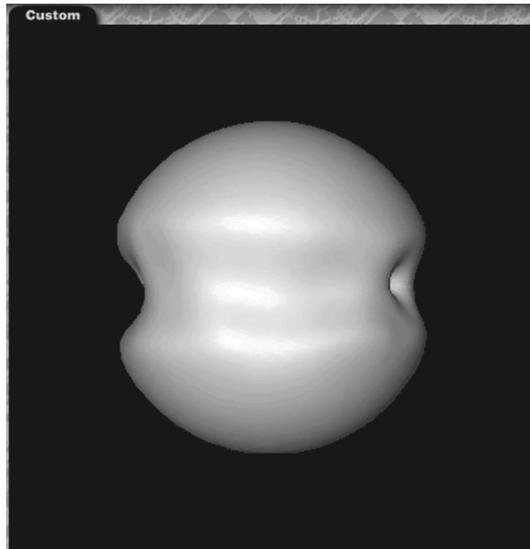


figure 3.21: Using the Smooth Brush Tool

Now that we've had a look at the brush tools, let's cover the **Radius** and **Pressure Brush Modifiers**.

Adjusting a Brush Modifier

To this point, we have not adjusted either of the Brush modifiers from their default settings. Let's go ahead and change them now. To adjust a Brush Modifier:

Move your pointer over the brush modifier to be adjusted (**Pressure**, for example).

Notice that the pointer turns into a left-right facing arrow. This indicates that you can change the values of the setting by clicking and dragging to the left or right.

As you click and drag, notice that a number appears above the Brush Modifier (figure 3.22).

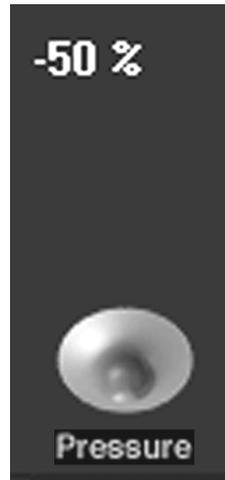


figure 3.22: Adjusting a Brush Modifier

The number indicates the current setting for the modifier, and it changes as you drag the mouse left and right.

Let's get a good look at how each of these modifiers affects the stroke. First clear the beat up old Sphere from the 3D workspace, then create another, fresh copy. As a matter of fact, it's a good idea to start with a fresh sphere between each step.

- Click the **Spheric Brush** tool.
- Set the **Pressure** to **+100%**, by clicking and dragging to the right on the Pressure tool.

Draw a stroke across the Sphere.

That should look quite a bit different than your previous strokes (*figure 3.23*).

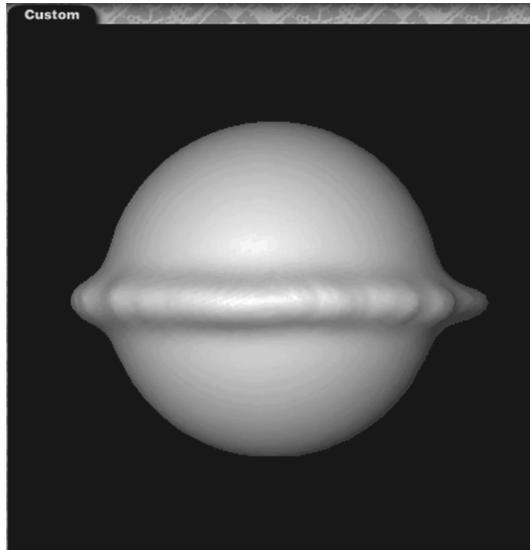


figure 3.23: Painting on the Sphere with +100% Pressure

Pressure determines whether the brush pushes in (**Negative Pressure**), or pulls out (**Positive Pressure**) on the object.

Now let's change the radius.

- Click on the **Radius** tool and drag to the left and right.

As you do, you will not only see a percentage number changing, but you will also see a circle appear in the center of the 3D workspace (figure 3.24).



figure 3.24: Changing the Brush Radius

Go ahead and change the **Radius** a few times, dragging a stroke across the Sphere each time. We'll wait for you!

3.4 Distorts

Let's have a look at what the **Distorts** (figure 3.25) can do.



figure 3.25: The Distorts

Basically, the Distorts give you the ability to change the shape of an entire object at one time with simple, interactive control.

Using the Distorts

Using a Distort couldn't be simpler. For example, let's start with a fresh Sphere and apply the **Spikes** Distort to it.

- Move the pointer over the Spikes button.

The **Spikes** button becomes highlighted, and the pointer turns into either a left right arrow, just as it did for the **Brush Modifiers**.

- Click and hold the mouse button, and move the pointer left and right.

Watch the **Sphere** in the 3D workspace. You will see spikes sprout out of its surface (*figure 3.26*) and grow and shrink as you drag the mouse.

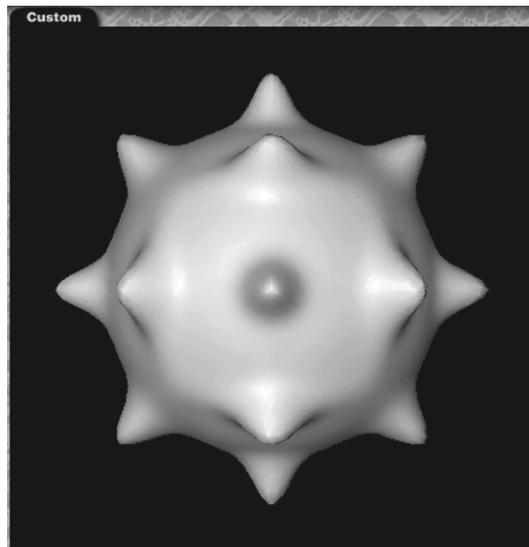


figure 3.26: A Spiked Sphere

The Distorts are quite a bit of fun—alone and in groups—you should try them all immediately.

Interactive Undo

There's one Distort that deserves a special mention because of its exceptional coolness—**Undo**.

What's so cool about the **Undo** Distort? You're probably thinking that you know all about **Undo**—pressing (Ctrl-z) or (Apple Key-z) on the Mac undoes the last operation, no big deal.

Well, the **Undo Distort** is a different **Undo**. It's actually a variable undo. What that means is that you can undo an operation from anywhere between 0 and 100% and view the results on the object as you drag the mouse.

Give it a try, and keep it in mind!

3.5 Paint&Optics

As much fun as Amorphium's Tools&Distorts are, there are plenty of other cool features to explore. Let's take a look at the Paint&Optics tools now.

- Make sure you have a fresh Sphere in the 3D workspace, then click the **Paint&Optics** button at the top of the screen.

You will now see Amorphium's **Paint&Optics** tools (*figure 3.27*).

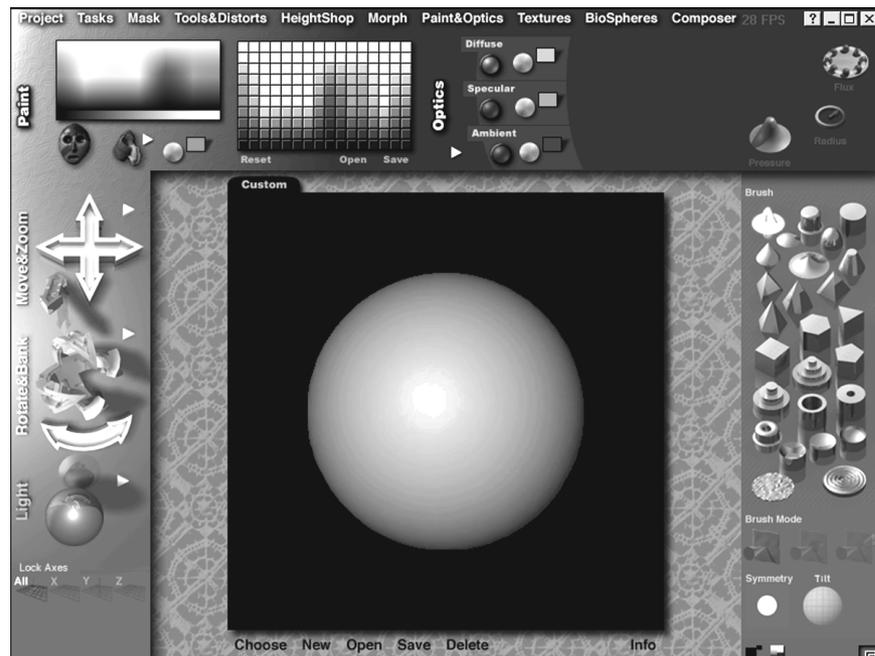


figure 3.27: The Paint&Optics Tools

These are the tools you will be using when it's time to paint your sculptures. In this case a sphere will do just as well as a sculpture.

The first thing we need to do is tell Amorphium that we want this to be a paintable object.

- Click the **Paint Object Switch** (*figure 3.28*).



figure 3.28: The Paint Object Switch

The switch will remain highlighted, and while it is, you will be able to paint on the object.

- Drag a stroke across the **Sphere**.

Notice that instead of changing its shape, the brush deposits red paint on the object's surface (*figure 3.29*).

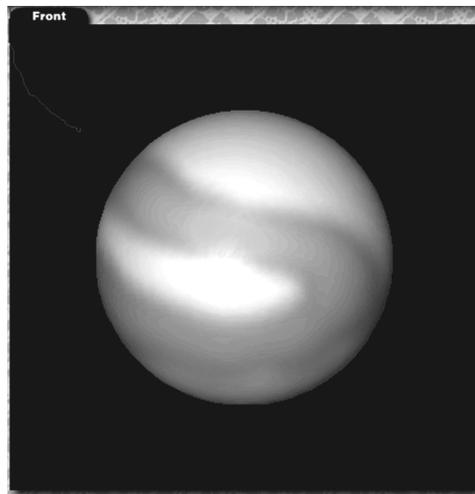


figure 3.29: Painting on the Sphere

Next, let's try painting with a different color next.

Next to the **Paint Object Switch** (figure 3.28), you should see a **Color Wheel**, and a **red box** (figure 3.30).

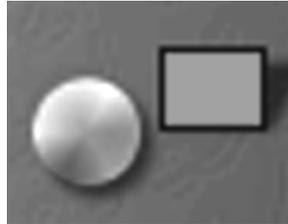


figure 3.30: The Current Paint Color and Color Wheel

The red box is the **Current Paint Color**, and this is the color that will be applied to your object when you use one of the brushes.

Setting the Current Paint Color

Clicking and holding on the **Current Paint Color** will bring up a **Palette** (figure 3.31), and pointer changes to an eyedropper.

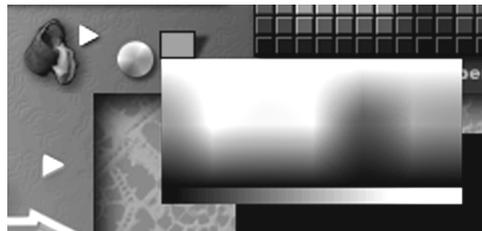


figure 3.31: Changing the Current Paint Color

You can select a color by moving pointer over the **Palette**. The **Current Paint Color** will change color as you drag over the object. Release the mouse button when the **Current Paint Color** is a color you like, then paint on the Sphere again.

You can also set the **Current Paint Color** with the **Palette**, or the **Color Swatch** directly above it.

Paint Bucket Another way to paint an object is with the **Paint Bucket** (figure 3.32).

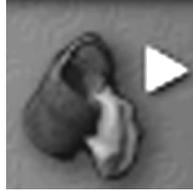


figure 3.32: The Paint Bucket

The **Paint Bucket** is used to paint the entire object at once, rather than with one of the brushes. To use it, simply click it once. The object in the 3D workspace will be painted with the **Current Paint Color**.

Paint FX Menu The white triangle next to the **Paint Bucket** gives you access to the **Paint FX** pop-up menu (figure 3.33).



figure 3.33: The Paint FX Pop-up Menu

The **Paint FX** allow you to add an organic effect like **Marble** to an object, by combining the **Current Paint Color** with whatever color is already on the object.

Go ahead and try it.

- Start with a fresh **Sphere**, then paint it a bright color like **yellow** by using the **Paint Bucket**.

Then make a much darker color the **Current Paint Color**, then select **Add Marble** from the **Paint FX** menu.

You should see a cool pattern on the Sphere (*figure 3.34*).



figure 3.34: Sphere with Marble Added from the Paint FX Menu

Before moving on, take a look at a few different Brushes. Start with a fresh Sphere, then apply paint to it using brushes of varying shapes. Note that some of the shapes have hard edges at the edge of the painted area, while others have soft edges. Try to get a feel for how the different brushes apply paint.

3.6 Mask

Let's have a look at another great Amorphium feature—**Mask**.

- Make sure you have a fresh Sphere in the 3D workspace, then click the **Mask** button at the top of the screen.

You will now see Amorphium's Mask tools (figure 3.35).

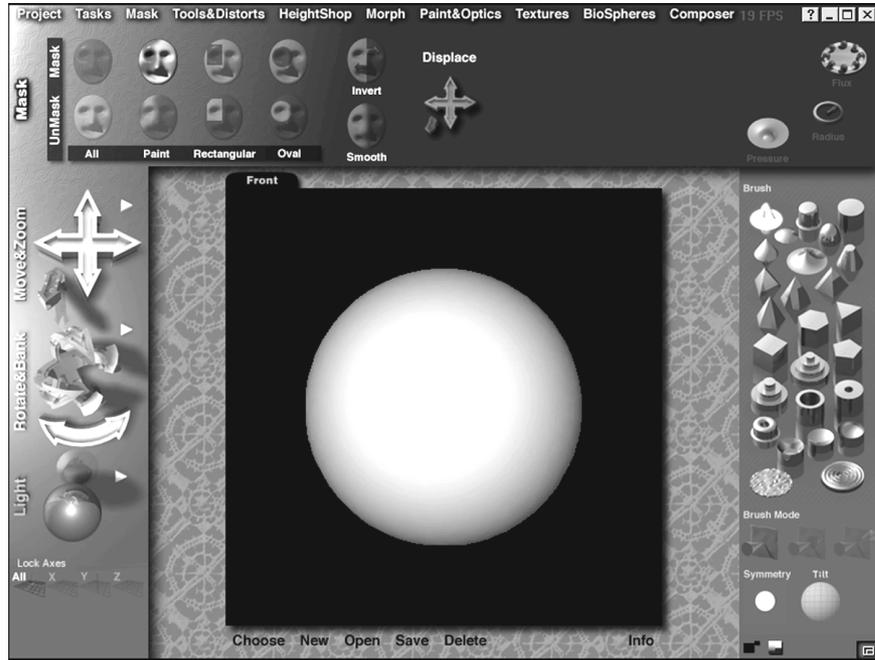


figure 3.35: The Mask Tools

The purpose of a mask is to allow you to select a very specific area of an object to work with, and to protect all other areas from any operations you may perform.

When you open the **Mask** tools, the Sphere will appear white in the 3D workspace. When masking, **White** indicates areas of the object that have not been masked, while **Red** indicates areas that have been masked.

The best way to see how a mask works is to paint one on the **Sphere**, then try to paint over it.

- Select the **Rectangle Mask** tool (*figure 3.36*).



figure 3.36: The Rectangular Mask Tool

- Drag a big fat rectangle mask on the Sphere (*figure 3.37*).

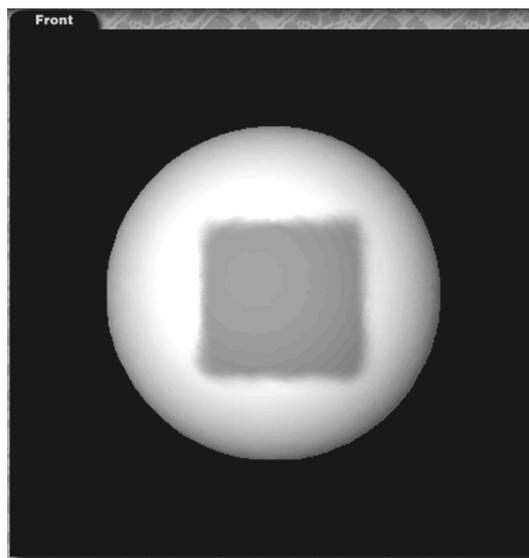


figure 3.37: The Sphere with a Rectangular Mask

- If the mask looks jagged, click the **Smooth Mask** button twice.
- Next,
- Click the **Paint&Optics** button at the top of the screen.

You won't be able to see the mask in the workspace, but it's there all right.

- Repeat the exercise from *section 5* by painting the sphere with a bright color, then selecting a darker color and choosing **Add Marble** from the **Paint FX** menu.

You'll notice a big difference in the results this time (*figure 3.38*).

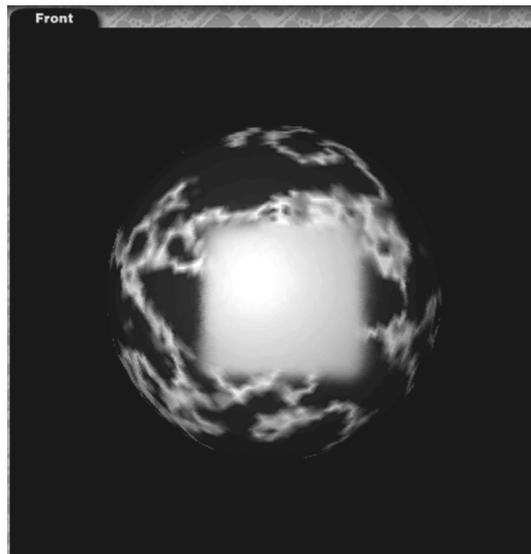


figure 3.38: Marbled Sphere with Mask

The area covered by the mask is missing the marble effect.

- Let's go back to the **Mask** tools now, and when you get there, click the **Invert Mask** button (*figure 3.39*).



figure 3.39: The Invert Mask Button

The mask is now inverted, and the rectangle is white and the rest of the sphere is red.

- Now go back to **Paint&Optics** and do the same thing as before, but this time start with the dark color you last used for the Paint Bucket, then select the light color for the **Add Marble** effect.

You'll have a Sphere with a reversed marble effect (*figure 3.40*).

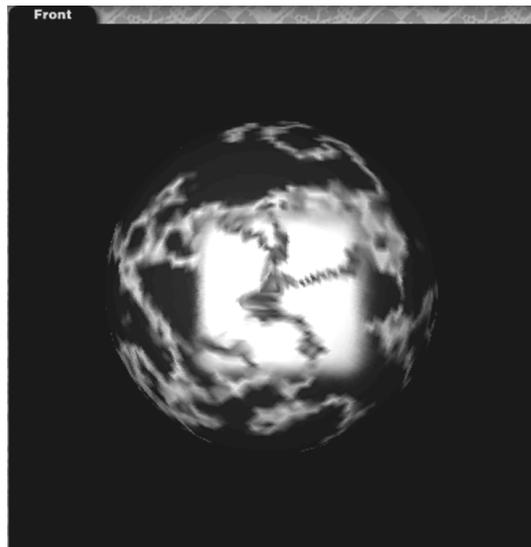


figure 3.40: Sphere with Reversed Marble Effect

3.7 HeightShop

The next stop on our tour is Height Shop.

- As usual, start with a fresh Sphere in the 3D workspace, then click the **HeightShop** button at the top of the screen.

You will now see Amorphium's HeightShop tools (figure 3.41).

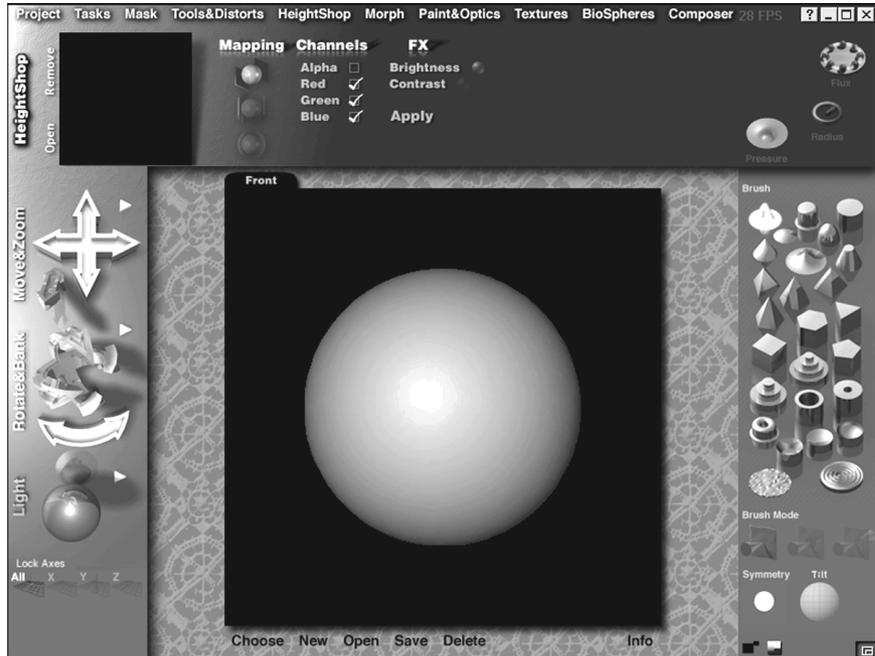


figure 3.41: The HeightShop Tools

HeightShop allows you to change the shape of an object by applying an image to it. Height shop looks at how bright various parts of the image appear in order to determine how to affect the object's shape.

The first thing we need to do here is to load an image.

- Click the **Open** button next to the **Current HeightShop Image** (figure 3.42).

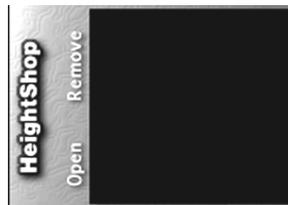


figure 3.42: The Open Button and Current HeightShop Image

An **Open File** window will appear.

- Navigate to Amorphium's **HeightShop** directory, and select the **Fractal** image.

The **Fractal** image now appears as the **Current HeightShop Image** (figure 3.43).

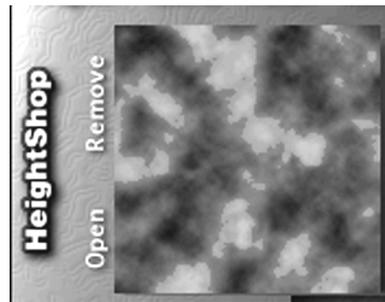


figure 3.43: The Fractal Image as the Current Height Shop Image

Now that we have an image, we must tell HeightShop how to apply it to the object. This is done with the **Mapping** options (figure 3.44).



figure 3.44: The Mapping Options with Spherical Mapping Highlighted

We have the choice of—from top to bottom—**Flat**, **Cylindrical** and **Spherical Mapping**.

- Click the **Spherical Mapping** button (the bottom choice).

We chose Spherical Mapping, because that is the option which most closely resembles the shape of the object that we will be applying the HeightMap to.

Finally, the last step is to apply the Height Map.

- Click on the **Apply** button and drag to the right.

Watch the Sphere change shape in the workspace as you apply the map (*figure 3.45*).

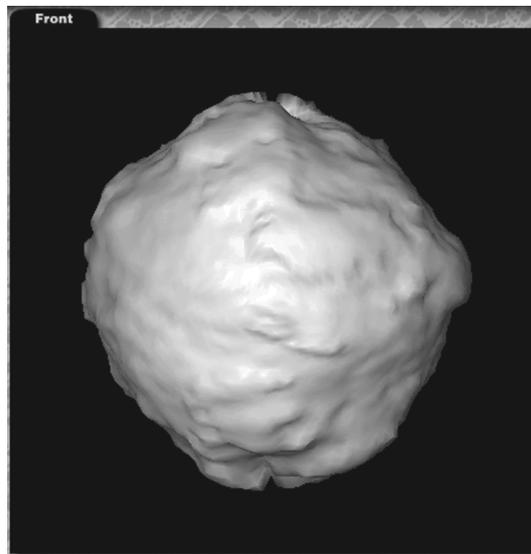


figure 3.45: The Sphere with the “Fractal” Height Map Applied

As you can see, after the Height Map is applied, the object now makes a really crummy Sphere, but a pretty decent asteroid. Clearly, HeightShop gives you a lot of power to create interesting objects with a minimum of effort.

For further experimentation, try other images in the HeightShop folder, and any other images you can find. Try applying Height Maps with a negative value as well as positive.

3.8 Textures

Let's move on to a feature that is related to HeightShop: **Textures**.

Once again, the ever-present **Sphere** will be our object of choice.

- Click the **Textures** button at the top of the screen to display Amorphium's **Textures** tools (figure 3.46).

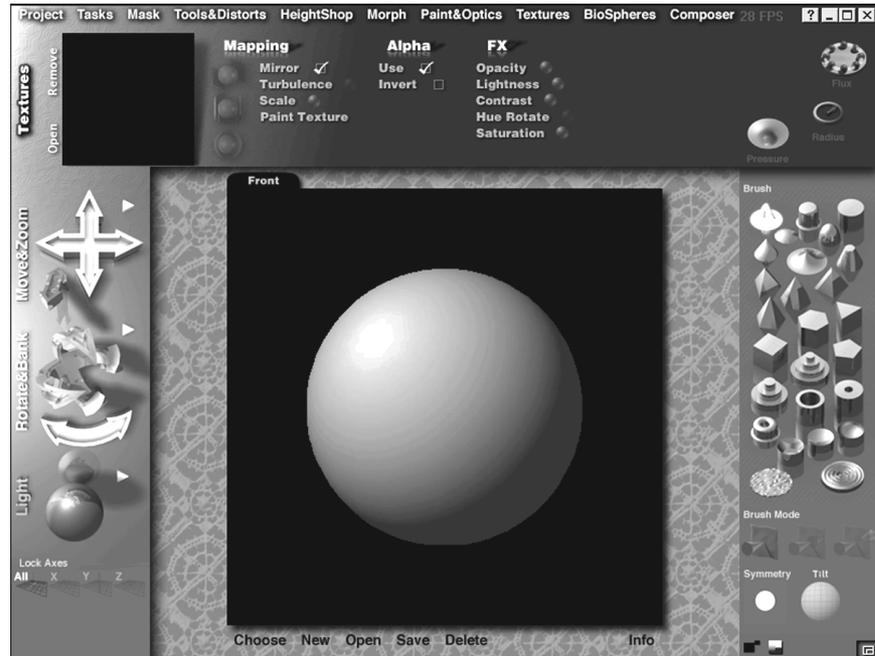


figure 3.46: The Textures Tools

Textures are applied in much the same way as Height Maps, but instead of changing the shape of the object, they change its color.

The difference between **HeightShop** and **Textures** is basically the same as the difference between the **Tools&Distorts** and **Paint&Optics** tools.

Once again, the best way to understand them is to apply a few to our hapless Sphere.

- Click the **Open** button next to the **Current Texture** (figure 3.47).



figure 3.47: The Open Button and Current Texture

An **Open File** window will appear.

- Navigate to Amorphium's **Textures** directory, and select the **Camo** image.

The **Camo** image now appears as the **Current HeightShop Image** (figure 3.43).

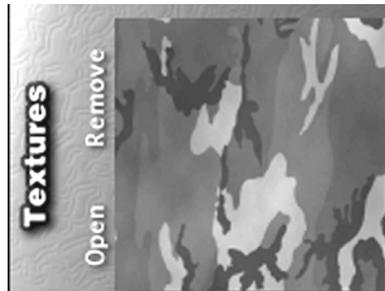


figure 3.48: The Camo Image as the Current Height Shop Image

You will notice a couple of differences between Textures and HeightShop:

- The image appears in full color.

- As soon as the Camo image is loaded, Amorphium applies it to the Sphere (figure 3.49).

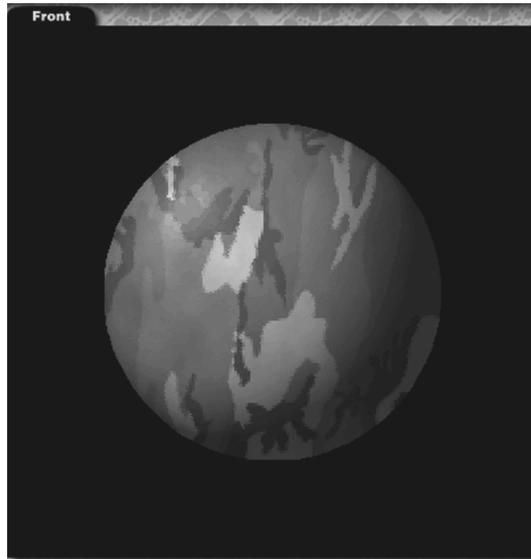


figure 3.49: The Camo Texture Applied to the Sphere

Besides the previously mentioned **Flat**, **Cylindrical** and **Spherical Mapping** options, there are plenty of other interesting features here, as well.

- You can change the placement of the texture on the object interactively by clicking on the **Current Texture** and dragging the mouse.
- You can change the size of the texture on the object interactively by clicking on the **Scale** button and dragging the mouse left or right.

Another cool feature is the **Paint Texture** feature. When you click the **Paint Texture** button, the texture is applied to the object as if it were paint, and will remain even if you remove the texture.

3.9 BioSpheres

Now we're going to have a look at one of Amorphium's most cutting-edge feature: **BioSpheres**.

Guess what! This time, we aren't going to use a Sphere!

- Click the **BioSpheres** button at the top of the screen to display Amorphium's **BioSphere** tools (*figure 3.50*).

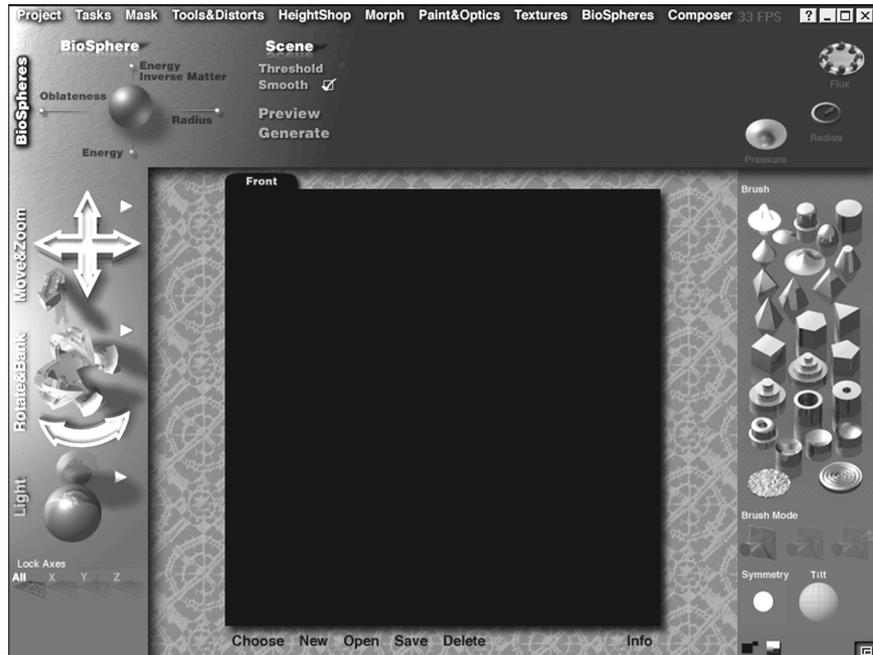


figure 3.50: The BioSpheres Tools

What are BioSpheres? BioSpheres are strange little spheroids with properties that make them perfect for easily creating amazing, organic 3D objects that can't be made with other modeling methods.

What makes BioSpheres so useful is the way they interact with each other. Each BioSphere has three properties that determine how it behaves:

- | | |
|------------|---|
| Energy | How strongly the BioSphere attracts or repels other BioSpheres. |
| Radius | The size of the BioSphere. |
| Oblateness | This odd word is another way of saying flatness. |

Let's stop talking about them, and start playing!

You'll notice that there is nothing in the 3D workspace. That's because other Amorphium objects don't appear when you use the BioSpheres tools.

Also, when you've finished creating a BioSpheres object, you'll have to turn it into a normal Amorphium object to use the Tools&Distorts, Paint&Optics and other tools on it. Don't worry—we'll get to that later.

The first thing we need to do is to create a new BioSphere.

- Click the **New** button below the 3D workspace.

Instead of seeing a menu with objects, a **BioSphere** is created in the 3D workspace as soon as you click the **New** button (*figure 3.51*).

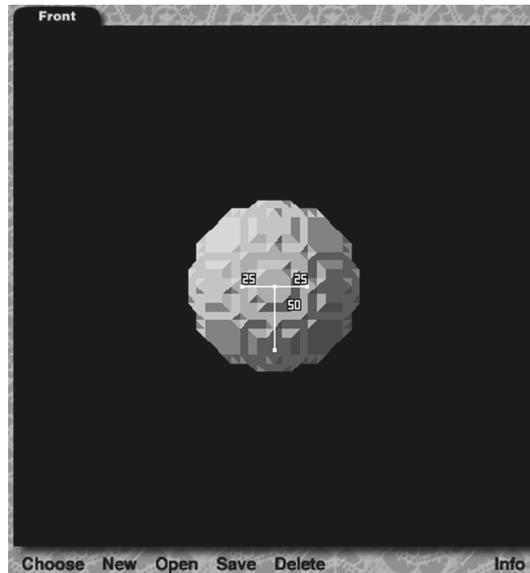


figure 3.51: A New BioSphere in the 3D Workspace

You'll notice that the BioSphere has a green T-shaped thing at its center, this thing is actually the **Properties Handles** for **Oblateness** (the left arm), **Energy** (the bottom arm) and **Radius** (the right arm) (figure 3.52).

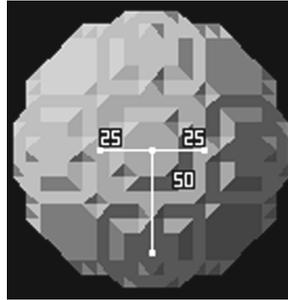


figure 3.52: Close Up of the Properties Handles

You will also see a number next to each arm. This number indicates the current value of each property. The default BioSphere has **Oblateness 25**, **Energy 50** and **Radius 25**.

Just above the 3D workspace, you will see a large replica of a BioSphere (figure 3.53).

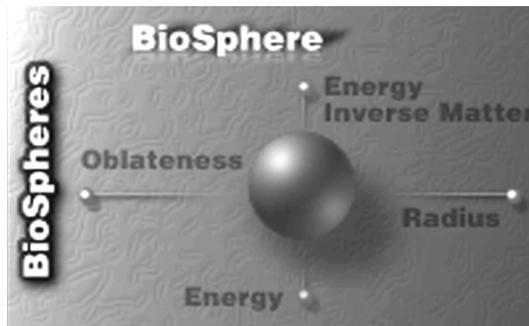


figure 3.53: The BioSpheres Control

This control duplicates the three **Properties Handles** on the BioSphere, but has a mysterious “fourth arm” which we’ll get to in a bit.

Let’s change the values of some of the Properties and see what happens.

- Click on the dot at the end of the **Oblateness** arm (on the left) and drag it to the left until the number reads **75**.

You should see a very oblong BioSphere (*figure 3.54*).

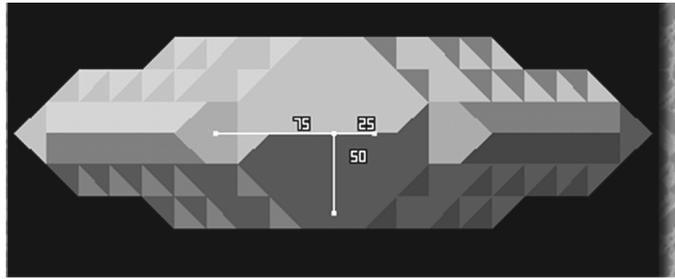


figure 3.54: BioSphere with Oblateness of 75

Notice that the Oblateness arm is longer, giving you a visual indication of its increased value.

- Set the **Oblateness** back to **25**.

We need to create another BioSphere to really see how the properties affect the way they interact.

- Click the **New** button below the 3D workspace.

The new BioSphere is added directly on top of the previous one. To see both at the same time,

- Click and drag on the green sphere at the center of the **BioSphere Control** or in the center of the BioSphere.

As you move the second BioSphere, you will notice that the two BioSpheres want to stick together, and form a peanut-shape as they pull apart (figure 3.55).

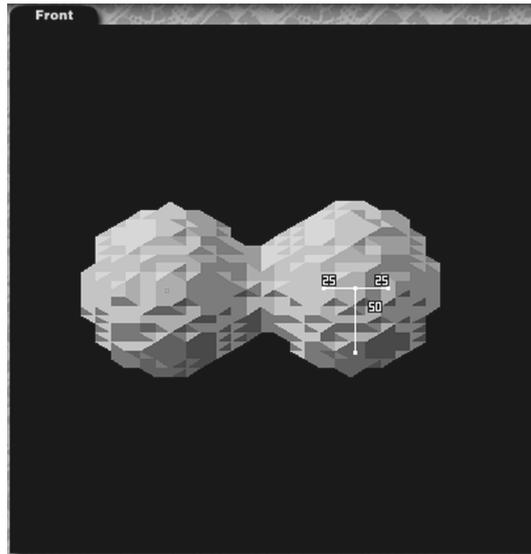


figure 3.55: Moving the Second BioSphere

Also notice that only one BioSphere has the Properties Handles. The other just has a red dot.

- To select any BioSphere so that you can adjust its properties and move it around, click on the **red dot** at its center.

Now let's play with the energy setting of the BioSphere on the right.

- Click on the dot at the end of the **Energy** arm (on the bottom) and drag it down until the number reads 100.

You should see the BioSphere on the right become much larger (figure 3.56).

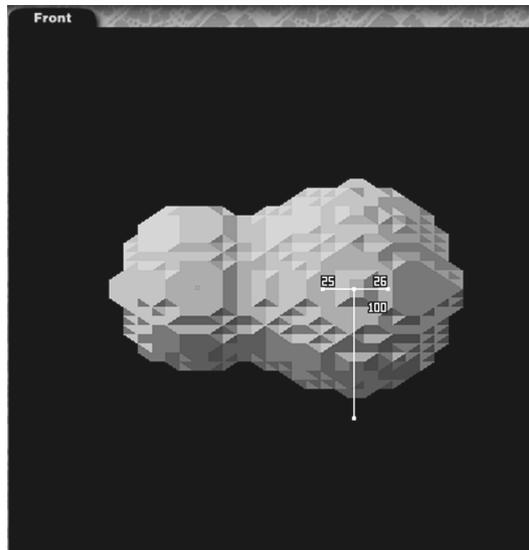


figure 3.56: BioSphere with 100% Energy

- Now select the BioSphere on the left and move it around.

You'll notice that it has to be moved much further away from the other BioSphere to escape its influence.

- Return the BioSphere to its previous position, then select the BioSphere on the right again.
- Click on the dot at the end of the **Energy** arm (on the bottom) and drag it up until the number reads **-100**.

You should see the BioSphere on the right become smaller and smaller and eventually disappear entirely, and the energy arm will flip over to the top (figure 3.57).

You have just given the BioSphere on the right negative or **Inverse Energy**.

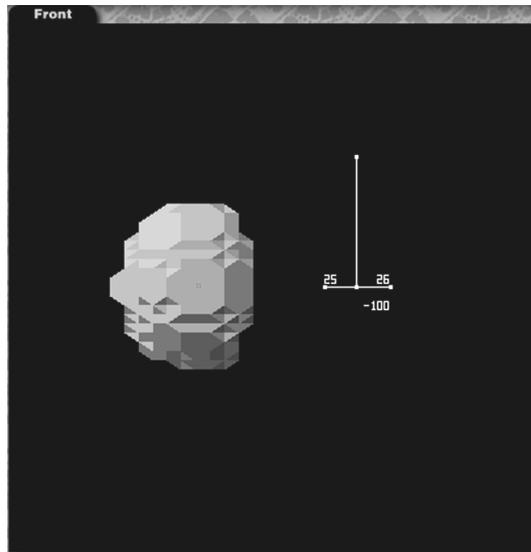


figure 3.57: BioSphere with -100% Energy

- Now select the BioSphere on the left again and move it around.

You'll notice that it is repelled from the other BioSphere, and that the closer it comes the smaller it gets. The Inverse Energy of the first BioSphere sucks the energy out of any BioSphere that gets too close.

Before we move on, go ahead and adjust the properties of the BioSpheres to see what happens.

Finally, before we move on, let's generate an Amorphium object from three BioSpheres.

- Delete any BioSpheres that may be in the workspace by clicking the Delete button found just below the workspace.

The currently selected BioSphere will be deleted.

- Click **New** three times to add three new BioSpheres with default values for **Oblateness**, **Energy** and **Radius**.

- Drag the three BioSpheres apart until they are just barely touching (*figure 3.58*).

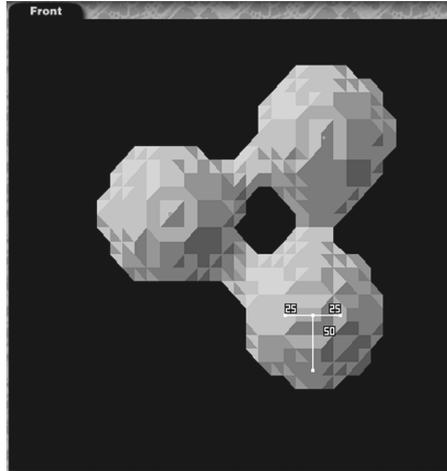


figure 3.58: BioSpheres in a Triangular Arrangement

- Click the **Generate** button to create an Amorphium object (*figure 3.59*).

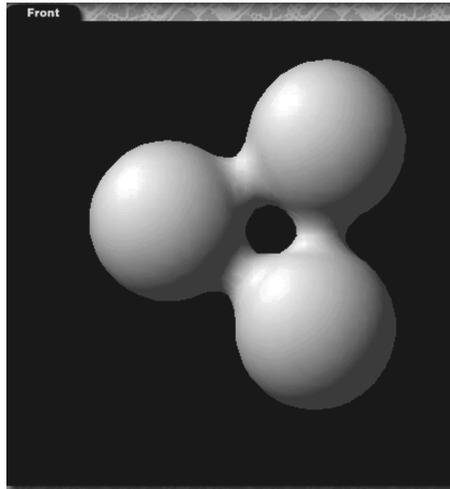


figure 3.59: The BioSpheres Generated as an Amorphium Object

Now you will be able to use the rest of Amorphium's tools to sculpt, paint or animate the object.

3.10 Tasks

The next stop on our tour is **Tasks**.

Click the **Tasks** button at the top of the screen to open the **Tasks** tools (*figure 3.60*).

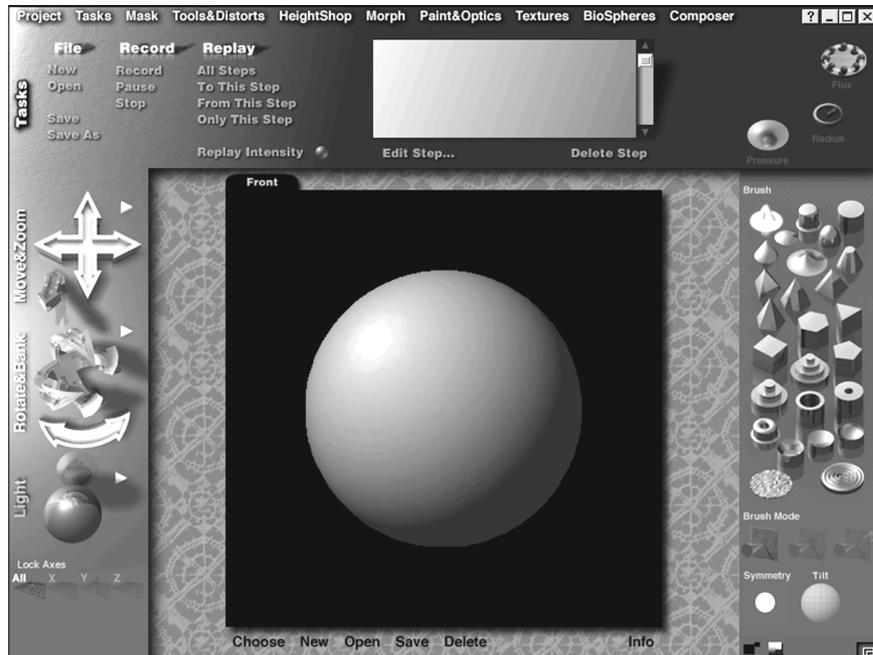


figure 3.60: Amorphium's Tasks Tools

The **Tasks** tools provide you with a way to record the actions you take in Amorphium and turn them into a script—which can be saved to disk.

There's no better way for you to see how useful this can be than for you to load one of the scripts we have included with Amorphium.

Click on the **Open** button (figure 3.61).



figure 3.61: The Open Task Button

This will open an **Open File** box on your computer.

- Navigate to Amorphium's **Tasks** directory and select the **CartoonHead.tsks** file.

You should see several lines of text appear in the **Task List** (figure 3.62).

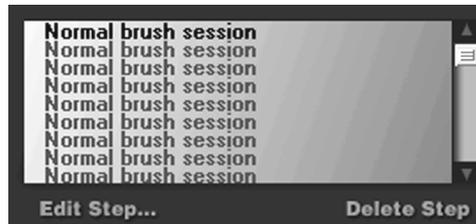


figure 3.62: The Task List

What do all these steps indicate? There's only one way to find out:

- Click the **All Steps** button (figure 3.63) and sit back and watch. . .

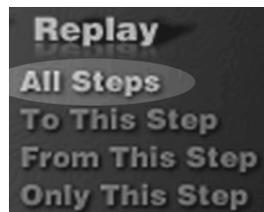


figure 3.63: The All Steps Button

Clicking the **All Steps** button tells Amorphium to perform whatever commands are in the **Task List** from beginning to end. You will see an object created before your very eyes.

When Amorphium is finished with the **CartoonHead Task List**, you should see an interesting character in the 3D workspace (*figure 3.64*).

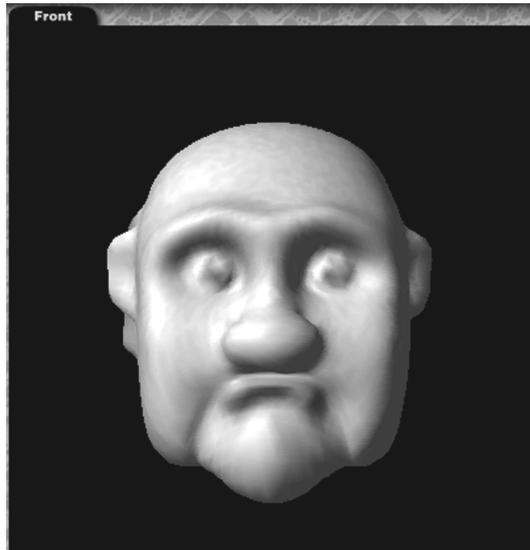


figure 3.64: The Result of the Task

You might want to look at some of the other Tasks in the Tasks folder. You can experiment with playing certain parts of the script, and even record your own when you create an object you really like.

3.11 Morph

One of the most exciting special effects currently seen in television and movies is **Morphing**—when one object (such as a person's face) changes smoothly into another.

Amorphium comes with a complete set of tools for you to create this cool effect for yourself.

- Click the **Morph** button at the top of the screen.

This will open the Morph tools (figure 3.65).

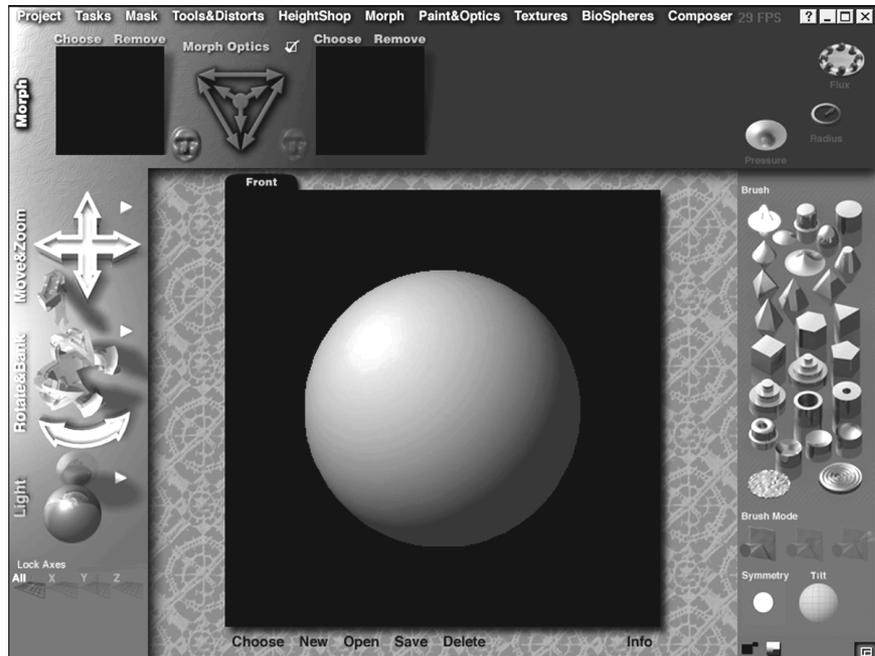


figure 3.65: The Morph Tools

To perform a simple morph, we need to open an object in each of the Morph Windows which are found on either side of the Morph Target Controls (figure 3.66).



figure 3.66: The Morph Windows and Morph Target Controls

Let's start with the Left Morph Window.

- Click the **Choose** button above the **Left Morph Window**.
A **Choose Object** pop-up menu will appear (*figure 3.67*).

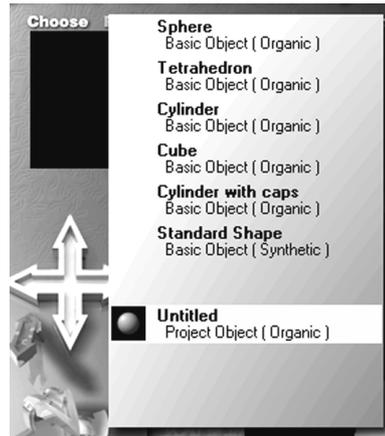


figure 3.67: Choose Object Menu for the Left Morph Window

For now, select a **Cylinder**.

- Do repeat the above steps for the **Right Morph Window**, but select a **Sphere**.

At this point you should see the **Cylinder** and **Sphere** objects in the **Morph Windows** (*figure 3.68*).



figure 3.68: The Cylinder and Sphere in the Morph Windows

Now we'll perform the morph. To do this, we'll use the **Left-Right** Morph Target Control (*figure 3.69*).

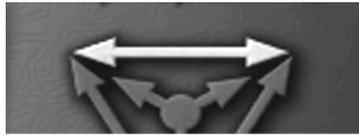


figure 3.69: The Left-Right Morph Target Control

Using the **Left-Right** Morph Target Control means that Amorphium will morph the two objects in the Morph Windows, with the new object appearing in the 3D workspace.

- Click on the **Left-Right** Morph Target Control and drag the mouse left and right.

You should see the shape in the 3D workspace morph interactively between a **Cylinder** and **Sphere** as you drag the mouse (*figure 3.70*).



figure 3.70: Morphing Between a Cylinder and Sphere

For further experimentation with morphing, try loading other objects into the Morph Windows, and using the Distorts on them.

3.12 Composer

And finally, we reach the last stop on our tour of Amorphium: **Composer**.

- Click the **Composer** button at the top of the screen.

This opens the **Composer** tools (*figure 3.71*).

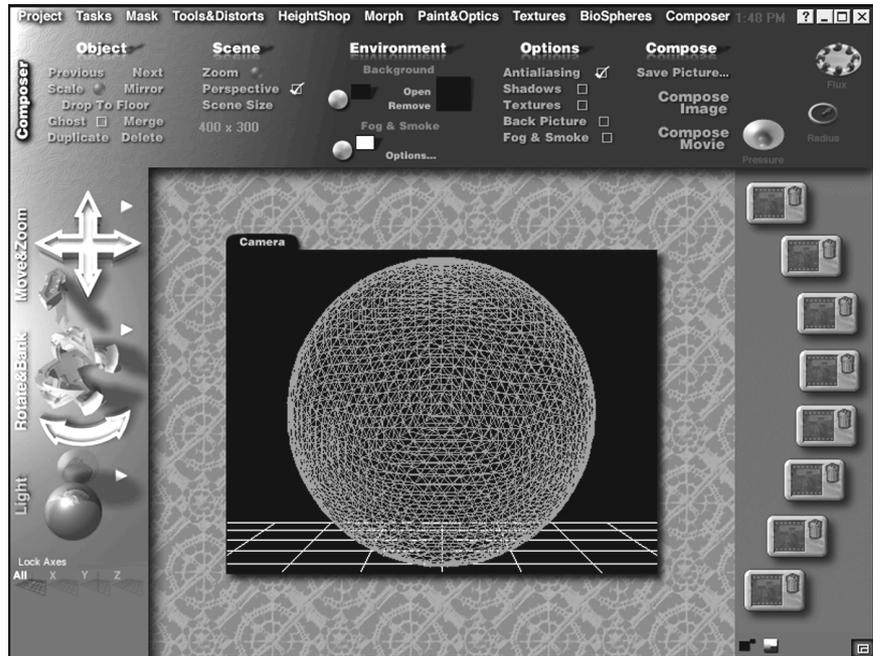


figure 3.71: The Composer Tools

Composer is where everything comes together, and we create pictures of our sculptures and animate them as well.

We'll make a simple animation, by using many of the things we've learned so far.

The first thing we'll do is take our good old sphere and spruce it up a bit.

- Go to the **Tools&Distorts** tools and apply the **Spikes Distort** to the **Sphere**.
- Next, go to **Paint&Optics** and use the **Paint Bucket** to paint the spiky Sphere a solid color (don't forget to turn on the **Paint Object Switch**).

Now we'll return to Composer.

- Click the **Composer** button.

You should now see a wireframe version of the spiky Sphere in the Composer workspace (*figure 3.72*).

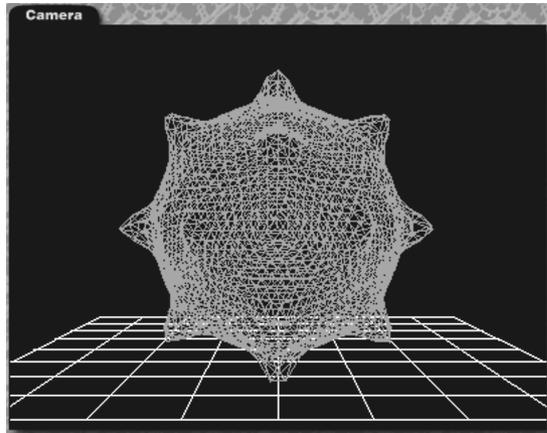


figure 3.72: The Spiky Sphere in the Composer Workspace

The first step in making the animation is to set the position and condition of the Sphere when the animation starts. For that we'll use a **Keyframe** (*figure 3.73*).



figure 3.73: The Key frames

- Click on the Top Keyframe.

The Keyframe will light up indicating that it has been set (*figure 3.74*).



figure 3.74: Setting the First Keyframe

Now to make the animation interesting, we'll need to do something to it and set another keyframe.

- Go back to **Tools&Distorts** and apply the **Twirl** Distort to the **Sphere**.
- Return to **Composer**, where the newly twirled and spiky sphere will appear in the Composer workspace (*figure 3.75*).

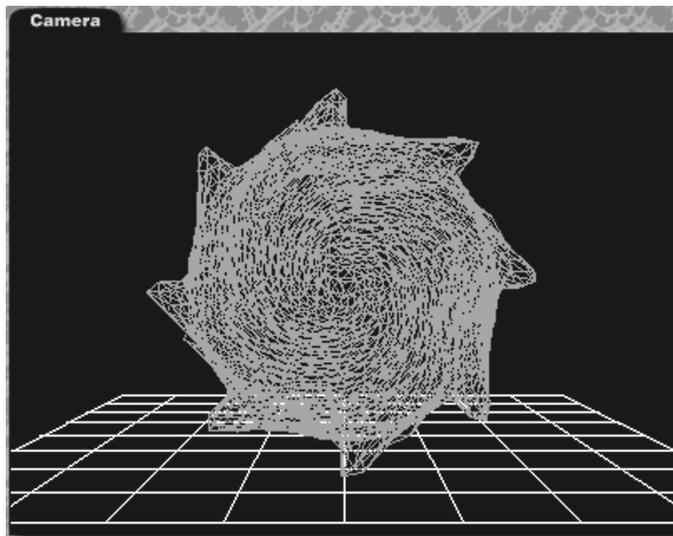


figure 3.75: The Twirled and Spiky Sphere in the Composer Workspace

Now, let's set another keyframe.

- Click the second keyframe from the top.

At this point, we have enough information to make an animation. We could continue modifying the object, moving it around, but we'll save more complicated animations for the Projects section of the manual.

Since we just want to get a quick look at this animation, we'll pick a small scene size that can be rendered quickly.

Click the **Scene Size** button (figure 3.76).

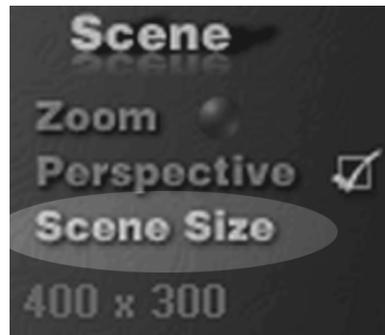


figure 3.76: The Scene Size Button

This will open the Scene Size pop-up menu (figure 3.77).

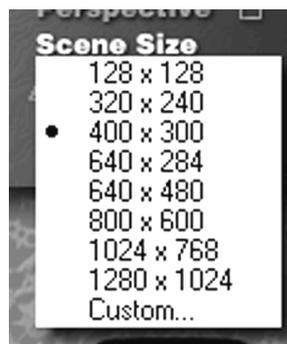


figure 3.77: The Scene Size Pop-up Menu

- Select **128x128**.

This means that Amorphium will create a movie that is 128 pixels wide by 128 pixels high. Remember that smaller picture sizes result in quicker picture times, but lower quality.

We are basically ready to have Amorphium create the animation.

- Click the **Compose Movie** button (figure 3.78).

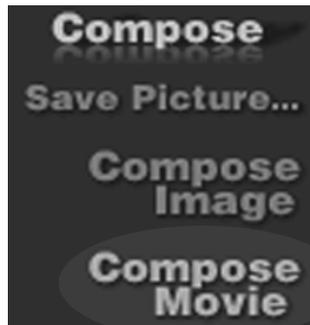


figure 3.78: The Compose Movie Button

This will open the **Make Movie Panel** (figure 3.79).

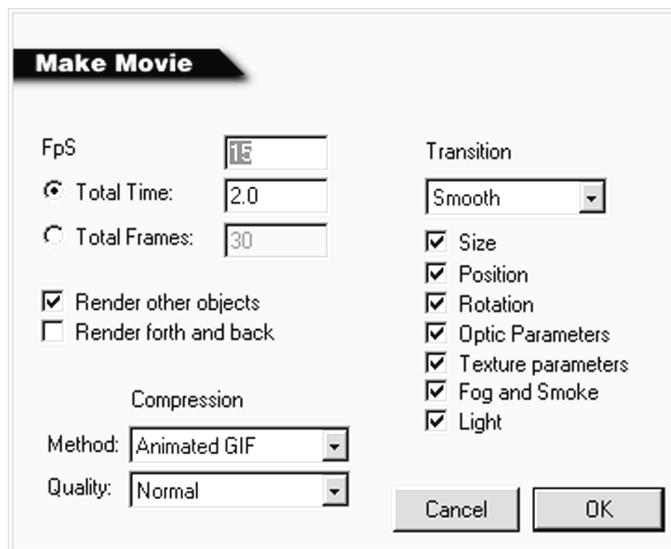


figure 3.79: The Compose Movie Panel

You don't need to worry about changing any of these settings for now. Just be aware that we will be creating a movie with a total time of 2.0 seconds, at a rate of 15 fps (frames per second) which means Amorphium will be rendering 30 individual frames.

- Click **OK**.

A window will appear in which you can enter a name for your movie.

Type in **test** and click **Save**.

Amorphium will now begin rendering your animation frame by frame. When it is finished, the movie will open in a window and begin playing.

Cool! Your first animation. When you are finished looking at it, click the mouse button anywhere on the screen, or press **Esc**.

The Amorphium screen will reappear, ready for your further experimentation.

What Now?

If you've gone through this tour, you have a pretty good idea of some of the things Amorphium can do, but you've only gotten a flavor. If you'd like more specific projects on creating different kinds of objects, you should look over the **Projects** section of the manual.

If you just want to experiment, go for it! you can use the **Reference** section to help you out with specific questions.

We hope you'll enjoy using Amorphium as much as we do! Please check the Amorphium web site at www.amorphium.com to find the latest on Amorphium and to download cool new scripts and objects.





Part II

Amorphium Projects

Chapter 4: Quick Projects

4.1 Sculpting a Piece of Fruit

Introduction

The purpose of this project is to show you how easy it is to make something familiar with Amorphium. In our case, we needed to add more fruit to our diet, so we created a pear. And we were hungry, so it took less than two minutes to do it.

Building with BioSpheres

You can build some incredibly complex objects with BioSpheres, but a pear is not one of them. A pear is incredibly simple.

- Click the **BioSpheres** button at the top of the screen.

You'll need to load a BioSphere into the workspace.

- Under the BioSpheres workspace, click the **New** button.

A blue BioSphere should appear in the center of the workspace (*figure 4.1*).

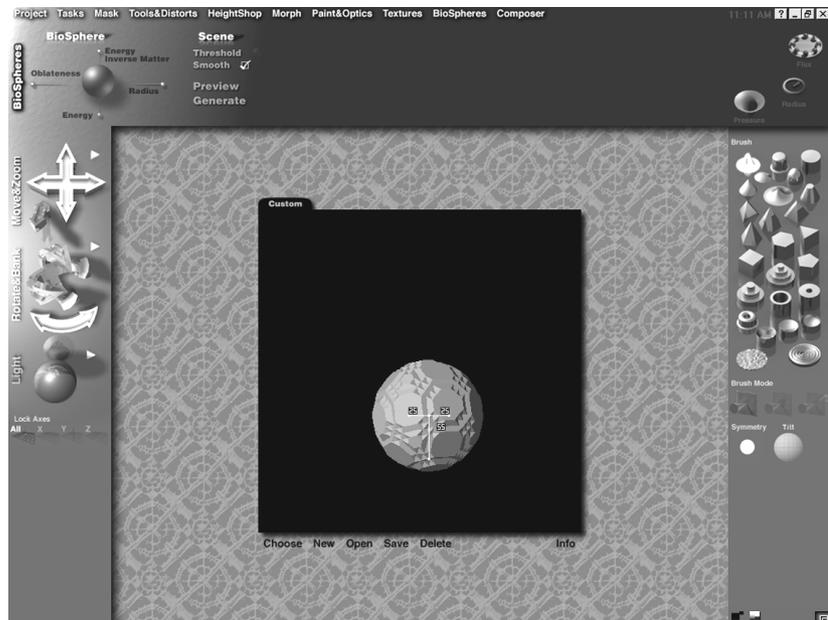


figure 4.1: A BioSphere

To create the basic pear shape, add one more BioSphere.

- Under the BioSpheres workspace, click on **New**.

The selected BioSphere will have green **Properties Handles** at its center, all others will have only a red dot.

- Move your pointer over the center of the Properties Handles and click and drag the mouse, pulling apart the BioSpheres (*figure 4.2*).

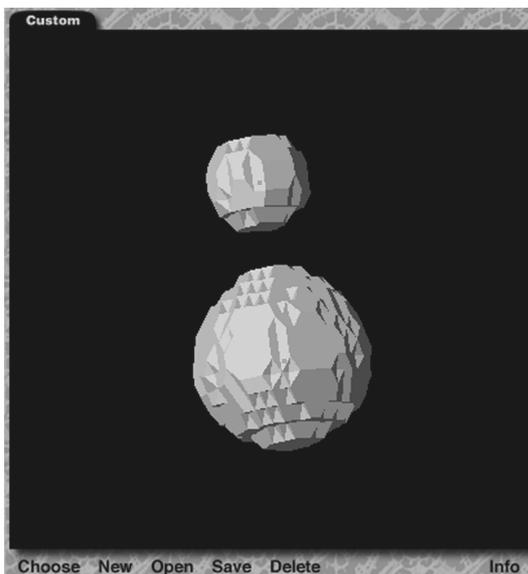


figure 4.2: Separating the BioSpheres

If you look at a pear, you'll see that the basic shape is like two spheres, one small and one larger, stuck together.

To adjust the **Energy** level of each BioSphere,

- Select it first by clicking on the **red dot**.
- Click on the **Energy** arm of the Properties Handles (on the right) then pull or push.
- Set the **Energy** of the small BioSphere to about **15**.
- Set the **Energy** of the larger, bottom one to about **55**.

Next,

- Push the two BioSpheres together to create the basic pear shape (figure 4.3).

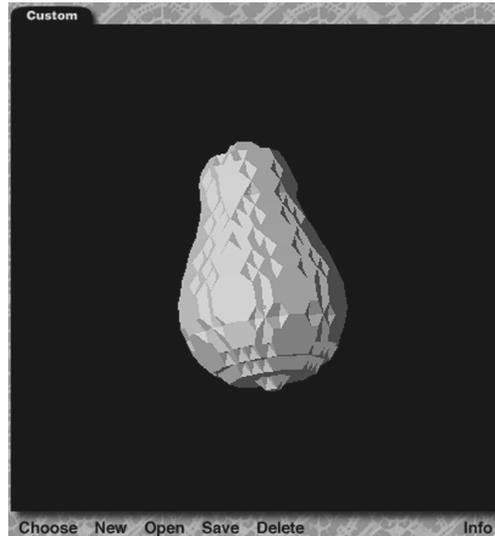


figure 4.3: The BioSpheres in Pear Shape

It would be a good idea to save this BioSpheres object before switching to Tools&Distorts mode. In fact, after each project step in Amorphium, get in the habit of saving the object. Mistakes are permitted and encouraged.

- Click the **Save** button below the BioSphere workspace.

To create the object to work on in Tools&Distorts mode,

- Click the **Generate** button (figure 4.4).

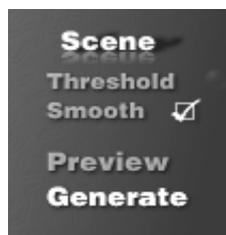


figure 4.4: The Generate Button

Shaping and
Detailing

From BioSpheres mode,

- Click the **Tools&Distorts** button at the top of the screen.

The new pear object will appear in the Tools&Distorts workspace (figure 4.5).

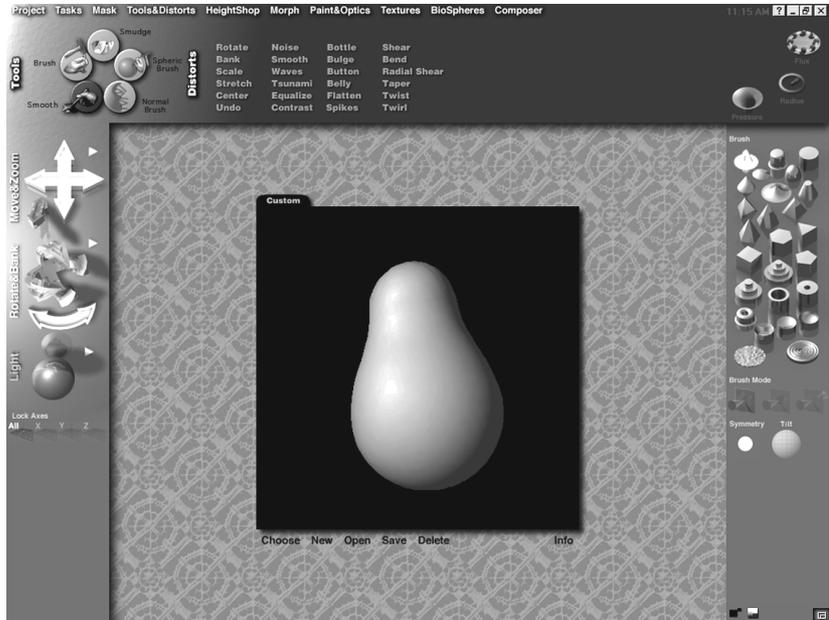


figure 4.5: The Pear Object in the 3D Workspace

In nature, pears are not perfectly symmetrical:

- **Rotate** the object into an upright position.

- Click and drag on the **Bend** Distort, and apply a slight (+5) distortion (*figure 4.6*).

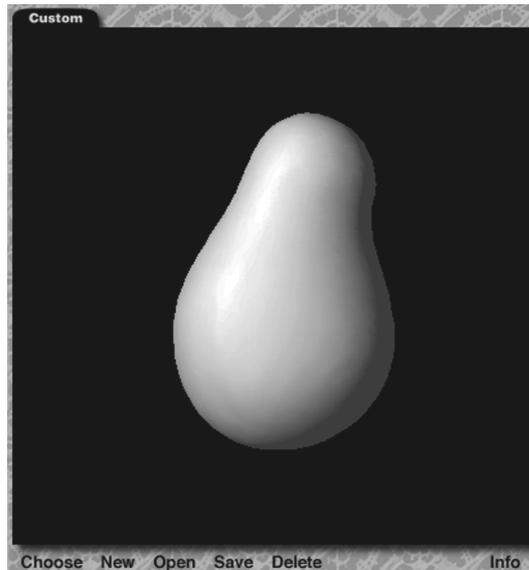


figure 4.6: Bending the Pear

There may be a few rough edges or evidence of a seam between the two Bio-Spheres on the bent object.

- Click on the **Smooth** brush tool (*figure 4.7*).

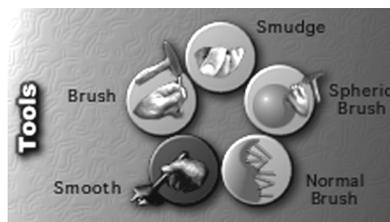


figure 4.7: The Smooth Brush Tool

- Use a lot of positive brush **Pressure** and a large brush **Radius**, and smooth the pear's surface.

Before detailing the pear with Amorphium's distorts tools, save the object. Come back to this step later and try different combinations of distorts.

- Click the **Save** button below the 3D workspace.

Pears have lots of bumps and ridges, so we'll add a few.

- Click on the **Normal Brush** tool (*figure 4.8*).

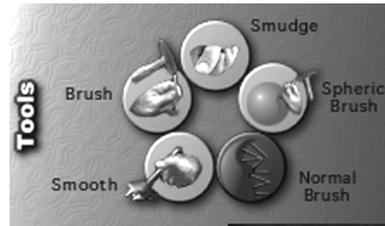


figure 4.8: The Normal Brush

This is a special brush tool to 3D modeling and has the effect of pushing or pulling on the surface normals of the underlying polygons. In other words, it makes really good bumps and indentations.

We recommend using a smaller brush Radius with low negative or positive brush Pressure to work over the surface of the pear. For larger bumps or deeper indentations, brush over the affected area several times. Don't forget to

make good use of the **Smooth** brush tool, switching between the two brushes as necessary (figure 4.9).

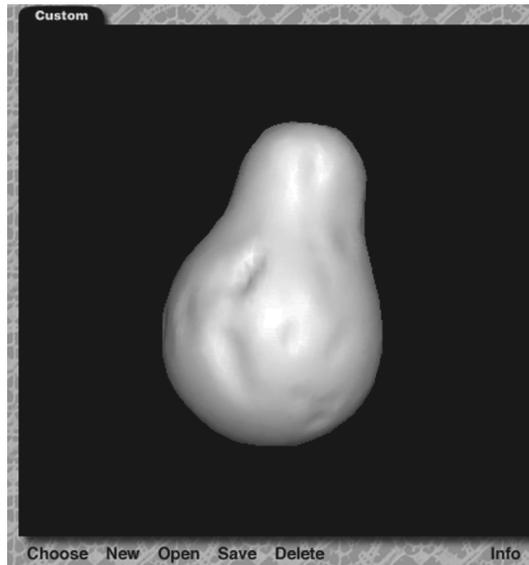


figure 4.9: Roughing Up the Pear

Make a Stem • Rotate the pear so the top is directly in front of you.

Use the brush **Radius** in the 3D workspace to help you center the object.

With the **Normal Brush** tool, a low positive brush **Pressure**, and a very small brush **Radius**,

- Click a few times to pull out the beginning of a stem (*figure 4.10*).

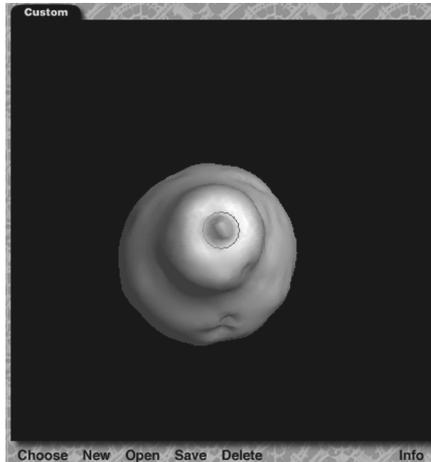


figure 4.10: Starting the Stem

- Rotate the pear again and continue pulling out the stem (*figure 4.11*).
Try a combination of the **Smooth** brush tool and the **Smudge** brush tool to shape it, but watch your brush pressure.



figure 4.11: Pulling Out the Stem

Did you save your object? Do so now, before painting.

Painting the Pear From Tools&Distorts mode,

- Click the **Paint&Optics** button at the top of the screen.

Your pear object will appear in the Paint&Optics workspace, waiting for you to paint it. To select a foundation color,

- Click on the **Color Wheel** next to the **Paint Bucket**.

When the **System Palette** appears (*figure 4.12*), select a color to paint your pear.

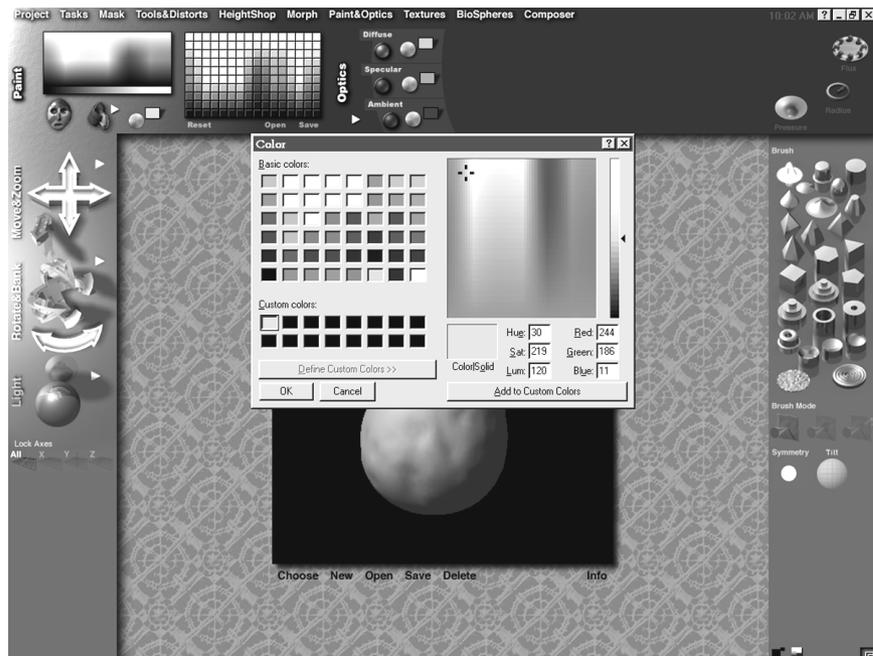


figure 4.12: The System Palette (PC version)

We chose a yellowish hue for the foundation color and clicked on the Paint Bucket to paint our pear (*figure 4.13*).



figure 4.13: Painting the Pear

In Paint&Optics mode, it's easy to modify the foundation color of an object by adding a textural effect with another color. In real life, the skins of pears have some discoloration depending on ripeness. In our case, we wanted a ripe, juicy pear, so we clicked on the color wheel again to bring up the color chart. We chose a color that was just a bit darker, but very close to the foundation color.

To apply the textural effect,

- Click on the **white triangle** next to the **Paint Bucket**.

When the Paint Effects menu appears, click on **Add Noise** (*figure 4.14*).

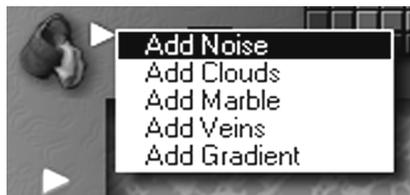


figure 4.14: The Paint Effects Menu with Add Noise Option

For effect, try adding a few splotches by using a very low brush pressure and a small brush radius a click a few times on the surface. Choose a darker shade of brown from the color wheel and paint the stem. Your pear should look good enough to eat (*figure 4.15*).

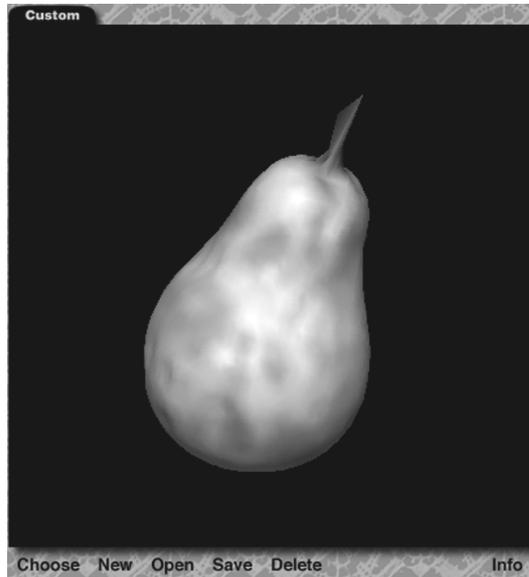


figure 4.15: The Finished Pear

4.2 Creating a Starburst Graphic

Introduction

The purpose of this project is to make a simple 3D button with text that you can use to call attention to any new product or service in a publication or on your web site. Along the way, you'll use several of Amorphium's powerful features such as **Mask**, the **Distorts** and **Paint&Optics** tools.

Working with Mask

The first step of this project is to create a mask which will protect part of an object so we can preserve its shape while we alter other parts.

- Click the **Mask** button at the top of the screen.
- If there isn't a sphere in the workspace, click the **New** button below the 3D workspace, and select **Sphere** from the menu.

With Amorphium's **Mask** tools, you can set areas to become masked—the masked areas will not be affected by any of the tools such as **Tools&Distorts** and **Paint&Optics**.

When you open the Mask tools objects appear as white. The areas to which you add a mask will turn red.

- Locate the center of the sphere with your pointer.

Use the brush radius indicator which appears at the center of the 3D workspace as your guide.

We'll use a **Snap Point**, which will define how the brush will be applied to the sphere, to mark the spot.

- To place a **Snap Point** on the center, hold down the **Alt** key and click in the exact center of the sphere (*figure 4.16*).

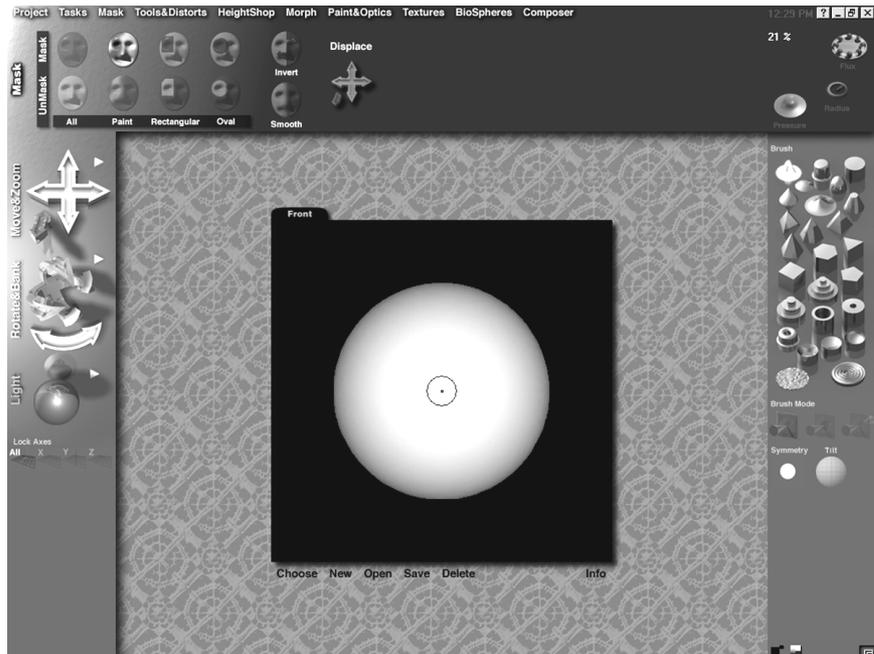


figure 4.16: Adding a Snap Point

We will be using several of Amorphium's **Distorts** to create the button. To prepare the object for these distorts we'll mask most of the surface of the sphere on the front and back sides.

- Increase the brush **Radius** to **100%**.
- Use the **Zoom** tool to move into the sphere so the **Brush Radius Indicator** covers all but its very outer edge (*figure 4.17*).

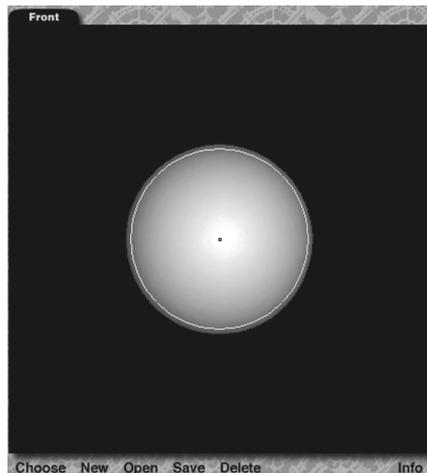


figure 4.17: Making the Brush Radius Cover Most of the Sphere

Tip: Selecting the **Z axis** button of the **Lock Axes** tool will ensure that the sphere remains centered in workspace as you zoom out. Click select the **All** option to restore complete move controls to the object.

It will be useful to paint the left and right sides of the Sphere at once:

- Click on the **Mirror** option of the **Brush Mode** tool (*figure 4.18*).

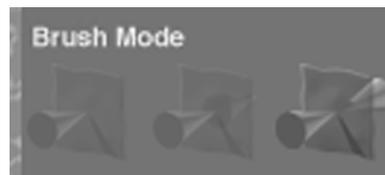


figure 4.18: The Brush Mode Tool

Applying a Mask in Amorphium is just like painting.. The brush **Pressure**, the brush **Radius**, and the shape of the **Brush** all affect the quality and quantity of the red mask that's applied. For the largest area of affect (which we want here),

- Increase brush **Pressure** to **100%** and choose a **Brush** with a wide surface area, like the one in the center of the top row (figure 4.19).

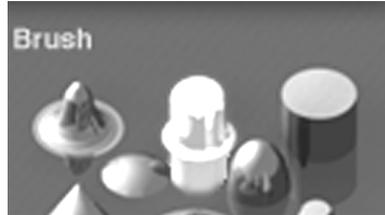


figure 4.19: Choosing a Brush

Since we'll be applying the mask with a brush,

- Click on the top **Paint Mask** button (figure 4.20).



figure 4.20: The Paint Mask Button

With the pointer over the snap point, hold down the mouse button and let the Mask cover the front side of the Sphere (*figure 4.21*).

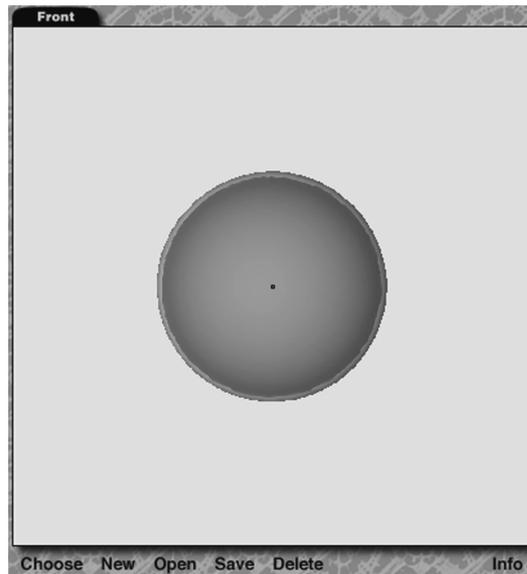


figure 4.21: Applying the Mask

Remember that we have Mirror Brush Mode selected so the back side of the Sphere will be masked as well leaving an unmasked stripe through the center of the Sphere which you can rotate the Sphere to check (*figure 4.22*).

- Select the **Y axis** option of the **Lock Axes** tool.

This will limit the sphere to rotating in only the Y axis—as if it were spinning around a line through the center of the 3D workspace from the top of the screen to the bottom..

- Click the **Rotate** tool and spin the sphere until you see the unmasked area in white at the front of the screen.

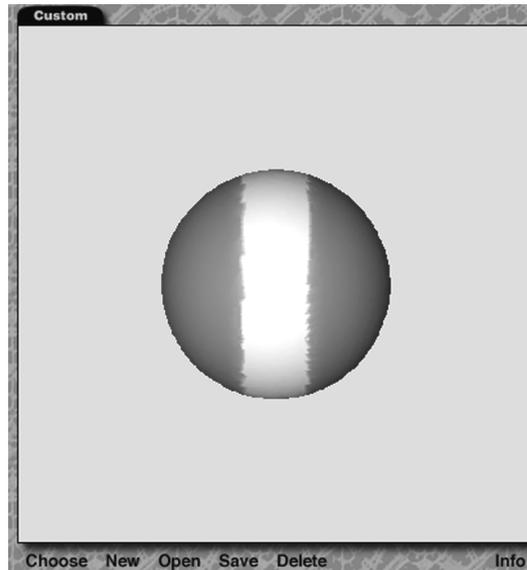


figure 4.22: The Unmasked Area of the Sphere

If the unmasked area isn't the same width at the top and bottom of the screen:

- Click the tab at the top of the 3D workspace and select **Front** from the menu, or press **I** on the keyboard.
- Click the **Unmask All** button.
- Repeat the application of the mask, making sure to start from the exact center of the sphere.

Shaping the
Button

When you have the mask just right, it's time to begin shaping the button into the starburst shape.

- Click the **Tools&Distorts** button at the top of the screen.

- Use the **Snap Point** and the **Brush Radius Indicator** trick to verify that the sphere is still centered in the workspace (figure 4.23).

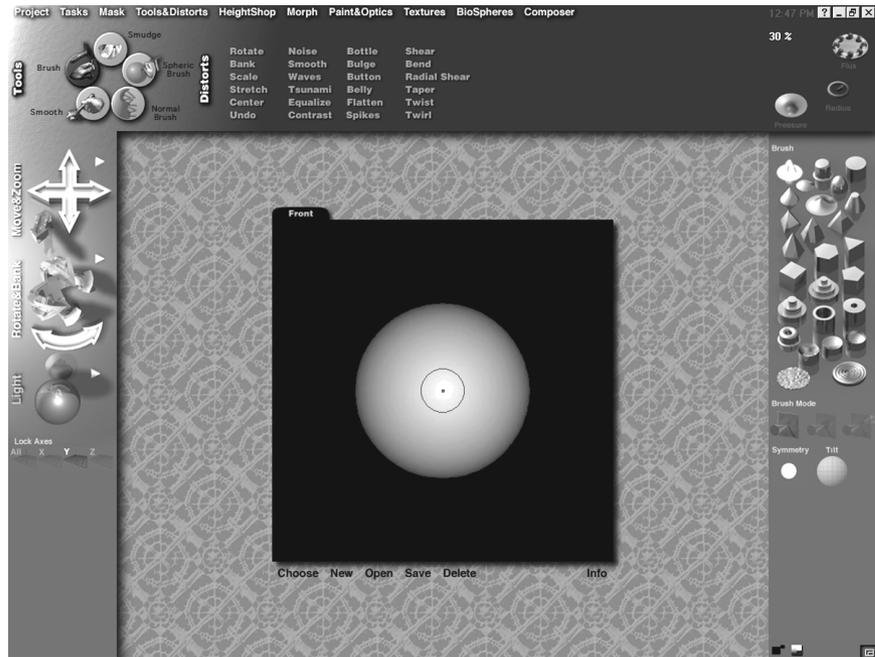


figure 4.23: Making Sure the Sphere is Centered in the 3D Workspace

- Locate the **Spikes** Distort (figure 4.24).

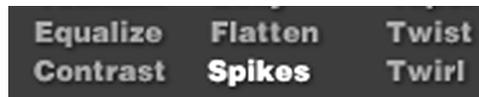


figure 4.24: The Spikes Distort

- Move the pointer over the **Spikes** Distort then click the mouse button and drag the mouse to the right to **100%** and eight good-sized spikes have been pulled from the sphere (figure 4.25).

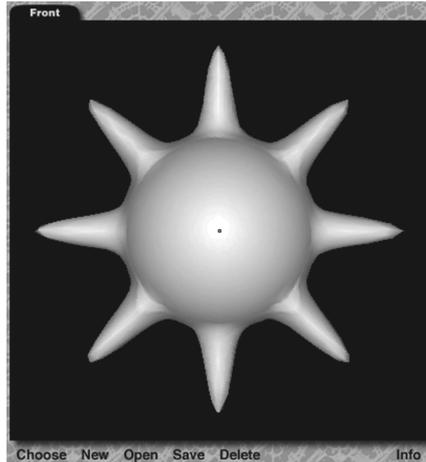


figure 4.25: The First Spikes; 100%

- Select the **Z axis** button of the **Lock Axes** tool, then use the **Bank** tool to rotate the Sphere so that the gaps between the Spikes occupy the space where the spikes previously were.
- Apply the **Spikes** Distort again, this time to **60%** (figure 4.26).

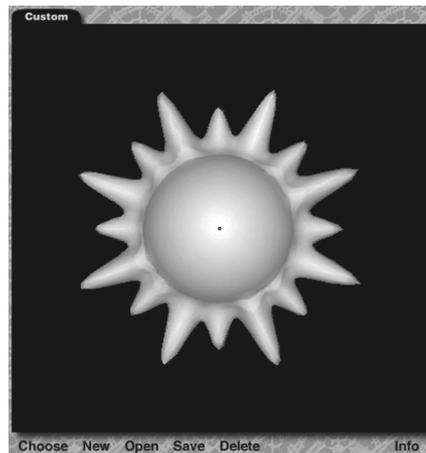


figure 4.26: The Second Set of Spike; 60%

Ok, now this sphere is beginning to look a bit like a starburst. Before we tackle the next steps, however, we'll need to remove the mask.

- Click the **Mask** button to open the Mask tools.
- Click the **Unmask All** button (*figure 4.27*).



figure 4.27: The Unmask All Button

The **Unmask All** button, as the name suggests, allows us to remove any and all masks on the object with one swell foop.

Now it's safe to return to shaping the (soon-to-be) starburst.

- Click the **Tools&Distorts** button to open the Tools&Distorts.

At this point, it will be helpful to us if we can see the sphere from another view while we work in the 3D workspace. Fortunately, Amorphium has a feature called **Dual View** which lets us do just that.

- Click the **Dual View** button (the little black box located near the bottom right of the screen).

- Select **Right** from the menu which appears (figure 4.28).



figure 4.28: The Dual View Menu

This handy little feature lets us see the sphere from the two views; in this case, the **Front** (3D workspace), and **Right** (Dual View).

- Click the **Flatten** Distort (just above **Spikes**, then drag the mouse to the right to **100%** (figure 4.29).

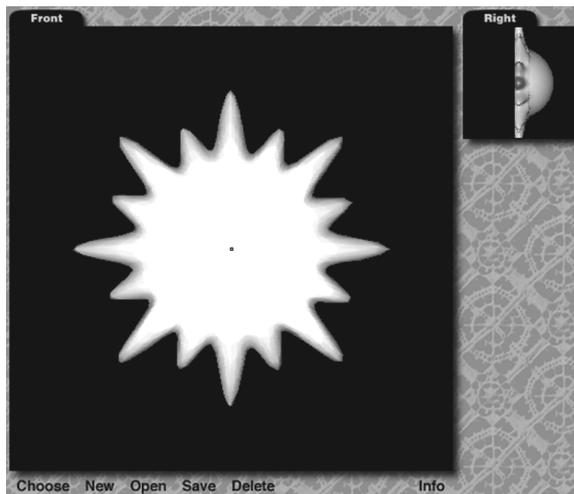


figure 4.29: Flattening the Front of the Sphere

That does for the front of the Sphere, but there's still the back:

- Click the **Tab** at the top of the 3D workspace and select **Back** or just press **4** on the keyboard instead.
- Click the **Flatten** Distort again, and drag the mouse to the right to **100%**.
- Return to the **Front** view when you're done.

The shape of this starburst (it's not really a sphere anymore, is it?) isn't quite right yet. We'll need to stretch it out a bit.

Locate the **Stretch** Distort (figure 4.30).

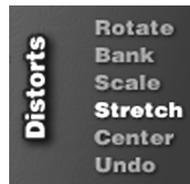


figure 4.30: The Stretch Distort

- Click and drag on **Stretch** until the starburst becomes oblong (figure 4.31).

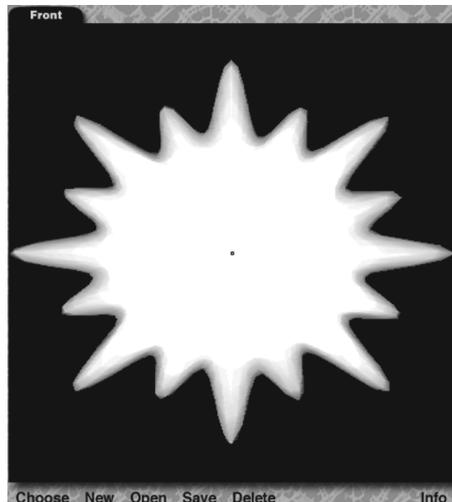


figure 4.31: Stretching the Starburst

Painting the
Button

OK. At this point, we're done with the shape, and it's time for a nice coat of paint.

- Click the **Paint&Optics** button at the top of the screen.

To call attention to your new product or service, paint the button a bright, friendly color.

- Click on a bright color from the **Color Swatch**.
- Click the Paint Bucket to apply the color to the starburst (*figure 4.32*).

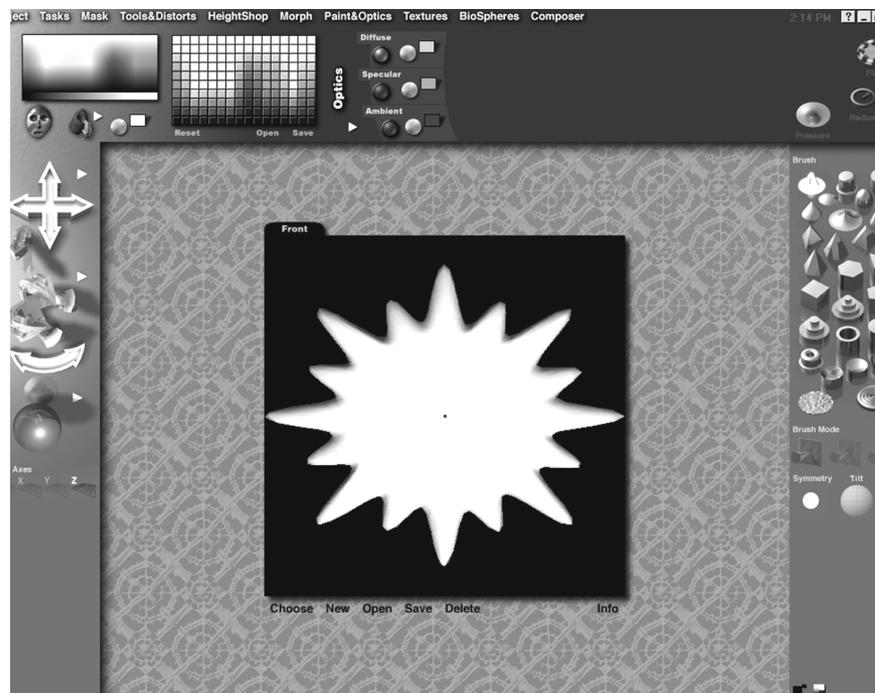


figure 4.32: Bright Yellow Starburst (in glorious black&white)

Creating Text
with FontMan

Wow. That was easy. The button's basically done, so now all we need to do is put a message on it, and we're good to go.

- Click the **New** button found under the 3D workspace and select **FontMan** from the menu which appears.

- This opens the **FontMan Panel** (figure 4.33).

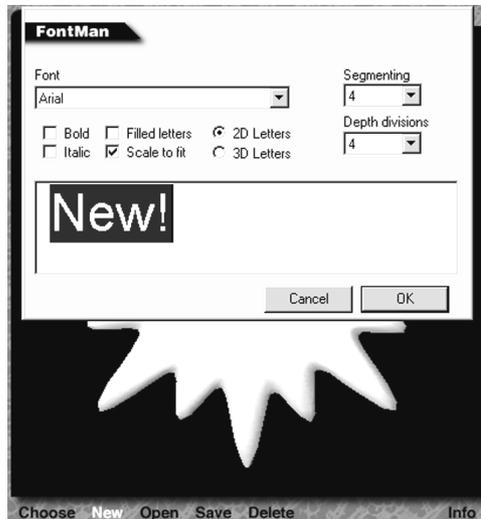


figure 4.33: The FontMan Panel

- Choose any font you like, then type **New!** in the text box.
- Click the **2D Letters** option, then click **OK** to generate your text (figure 4.34).



figure 4.34: The Text for the Starburst

The text appears in the 3D workspace, replacing the starburst (don't worry, it's still there!).

- Go ahead and pick a nice contrasting color, such as red, then use the **Paint Bucket** again to paint the text.

Putting the Parts
Together

Now that we've got our 3D button and the text to put on it, our last step is to combine the two into a single object.

- Click the **Composer** button at the top of the screen.

Any objects you have been working on will appear in the Composer workspace in wireframe. All open objects are placed together, one on top of the other, and your point of view of the Composer workspace is set to **Camera** view (figure 4.35).

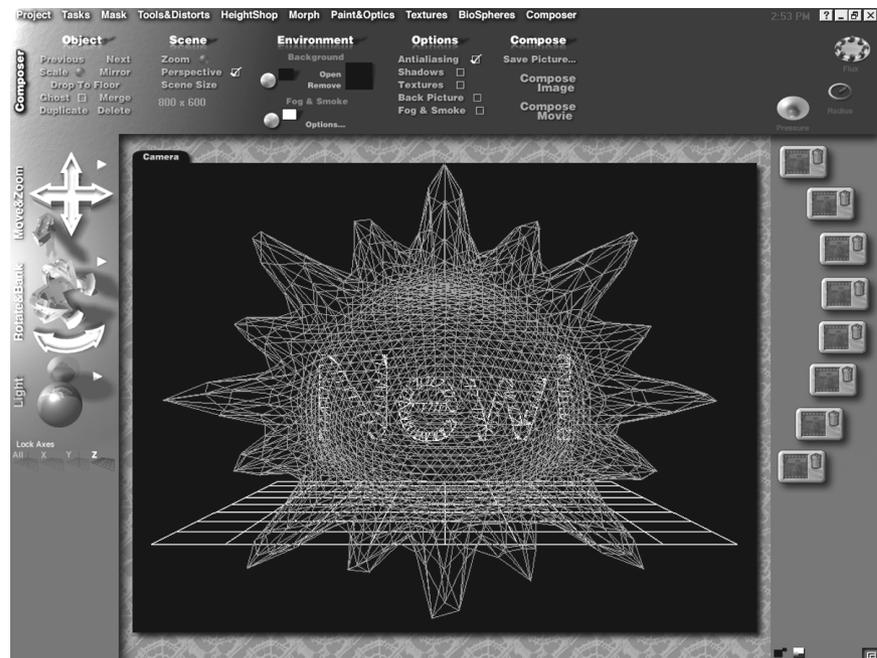


Figure 4.35: The Button and Text in the Composer Workspace

It's a good idea to get a look at the objects from another view—the text won't appear on the button if it's behind it when we combine the two.

- Click the **Tab** at the top of the Composer workspace and select the **Right** view, or just press **2** on the keyboard

Your point of view of the Composer workspace is set to the Right view (*figure 4.36*).

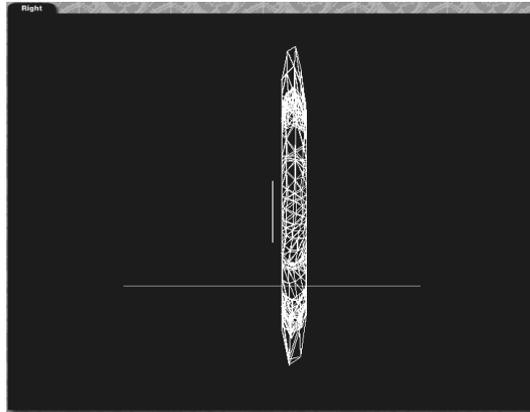


figure 4.36: Composer Workspace in Right View

We want the text to cast a shadow on the button when we render the scene, so we'll need to move it a little in front of the button's surface.

- Click the **Previous** or **Next** Object buttons (*figure 4.37*) until the text turns red

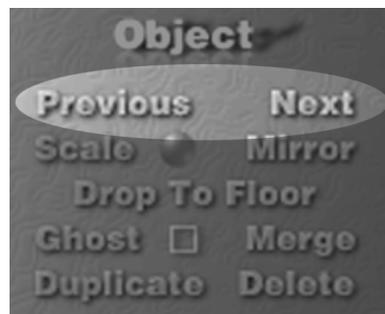


figure 4.37: The Previous/Next Object Buttons

- With the **Move** tool, move the text until it appears just in front of the button.

Remember that we're currently looking at the 3D workspace from the Right point of view, and in this view, in front of the button means just to the left of it.

- Check the **Antialiasing** and **Shadow** Options (figure 4.38).



figure 4.38: Selecting the Antialiasing and Shadows Options

Selecting these options will tell Amorphium to render with **Antialiasing** enabled, which will make the image look smoother, as well as **Shadows**, so the text will cast a shadow on the button.

You'll want to make sure that the background color behind the button matches the background where it will be used, such as a web page. Quite often, this is black—the default Background Color. To select a different background color:

- Click on the **Color Wheel** next to the **Background Color** (figure 4.39) and select the appropriate color from the palette which appears.

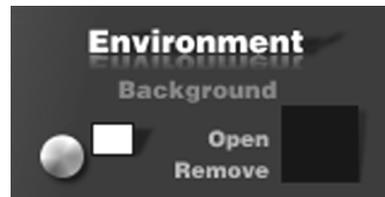


figure 4.39: The Background Color and Color Wheel

At last, it's finally time to make our picture.

- Click the **Compose Image** button (*figure 4.40*).

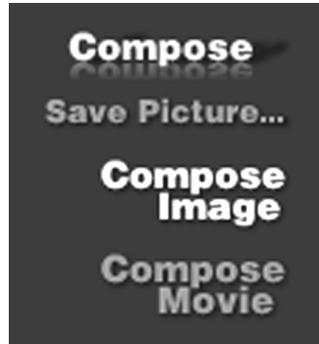


figure 4.40: The Compose Image Button

Amorphium will quickly render the scene, and you'll see the Starburst, complete with text when it's finished (*figure 4.41*).



figure 4.41: The Starburst Button with Text

- Click the mouse button to return to the Composer workspace.

If you'd like to experiment a bit, try a different font for the text, and perhaps move the Light around and move the text further from and nearer the Starburst. Just select **Compose Image** to view the results of your experiments.



Chapter 5: Quick Projects, Part Deux

5.1 Creating a Cartoon Face

Introduction The purpose of this project is to demonstrate how you can quickly sculpt a simple cartoon face from a sphere using the **Normal Brush** tool and **Brush Symmetry**.

Starting Out If you're not in **Tools&Distorts** mode,

- Click the **Tools&Distorts** button at the top of the screen.
- If you don't see a sphere in the workspace, click on **New** and select **Sphere** from the menu that appears (*figure 5.1*).

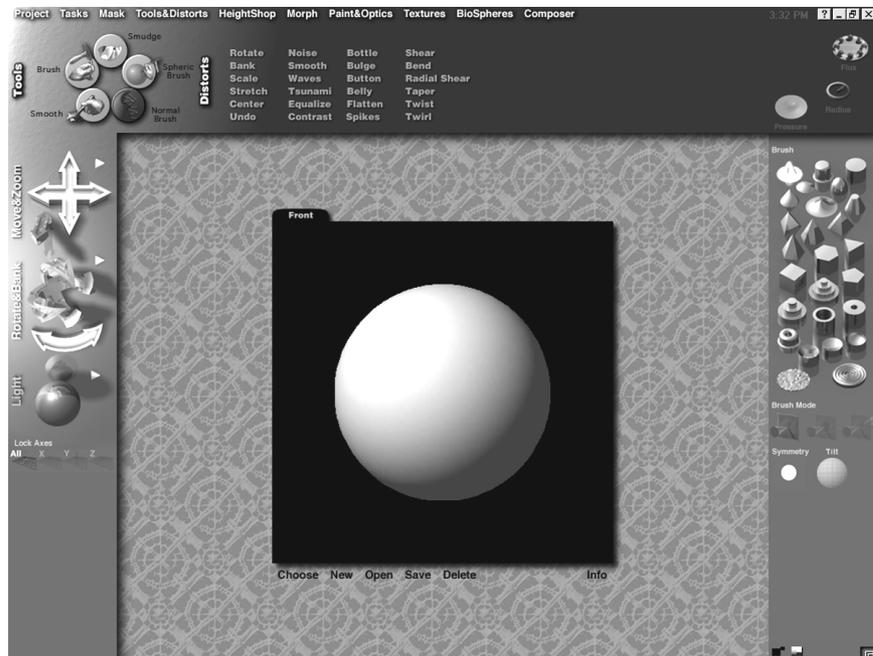


figure 5.1: Standard Sphere in the 3D Workspace

Amorphium defaults to the **Brush** tool, but there's a better choice for this project:

- Click the **Normal Brush** tool (*figure 5.2*).



figure 5.2: Normal Brush Tool

The **Normal Brush** tool influences the surface of an object perpendicular to the surface it is being applied to, which makes it great for controlled pulling and pushing on an object. We'll use this brush tool to create our cartoon face.

We'll also stick with Amorphium's default brush shape (*figure 5.3*), set to a very low positive brush **Pressure** and medium brush **Radius**.

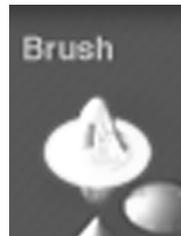


figure 5.3: The Default Brush

There are times when it makes sense to work on both sides of an object at once, and creating a face is just such a time. For that reason, Amorphium provides you with a full compliment of Brush Symmetry tools, one of which we will now select.

- Click the Brush **Symmetry** button and choose the **2-Way Mirror** pattern (figure 5.4).



figure 5.4: Brush Symmetry Button and Menu; 2-Way Mirror Symmetry Selected

Cartooning Around

- With your pointer just above the center of the sphere, begin pulling out the eyebrows.

With **2-Way Mirror** symmetry turned on, you only have to pull out one eyebrow. It doesn't matter which side of the face you start with; Amorphium will do the other side for you.

- For the nose, center the pointer below the brows and push upward.

Since you're working with low brush Pressure, you may want to make several passes and tweak the nose a bit. When you're done, your face should have noticeable eyebrows and a nose (figure 5.5 and figure 5.6).



figure 5.5: Face with Eyebrows and Nose, Front View

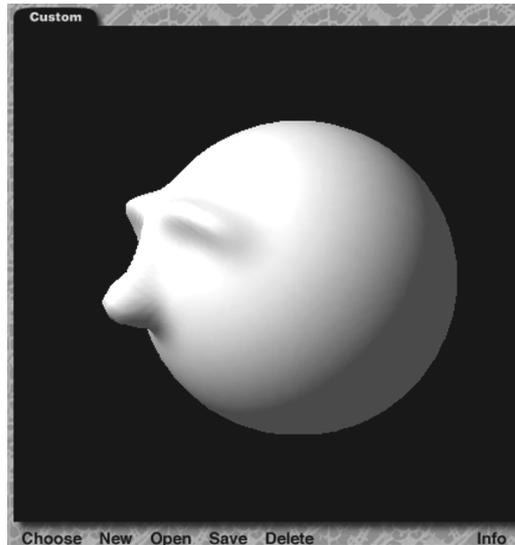


figure 5.6: Face with Eyebrows and Nose, Side View

- To sculpt the mouth, change the brush **Pressure** to a low negative value, and push in below the nose (*figure 5.7*).

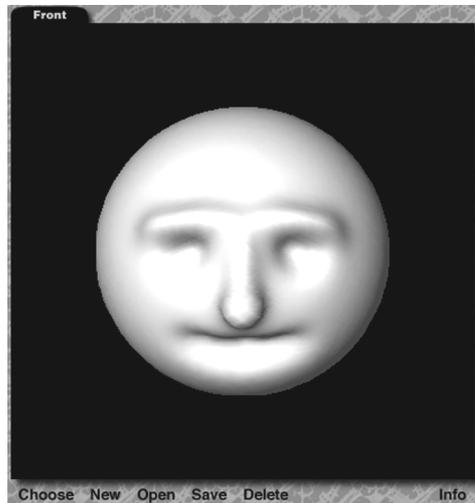


figure 5.7: Face with Mouth Added

- When you've completed the mouth, rotate the object until the chin area is in front of you. Adjust the brush **Pressure** back to a low positive value and begin pulling out the chin (*figure 5.8 and figure 5.9*).

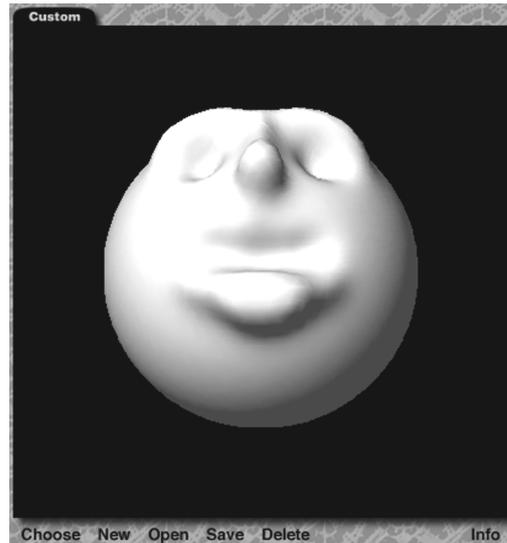


figure 5.8: Face with Chin Pulled Out, Front View

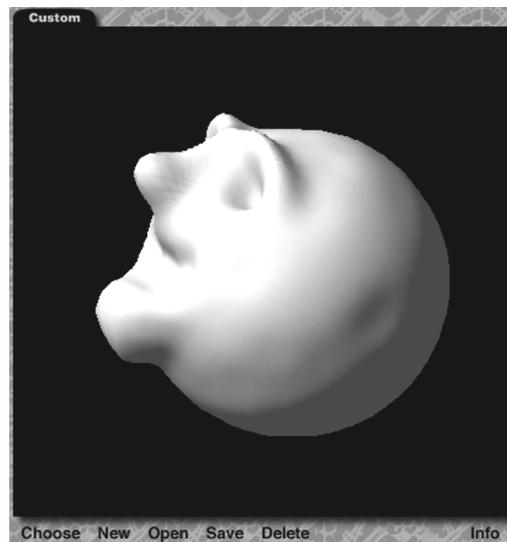


figure 5.9: Face with Chin Pulled Out, Side View

- When you're done, turn off symmetry, rotate the object in the workspace, and add a few bumps and bruises (*figure 5.10*).

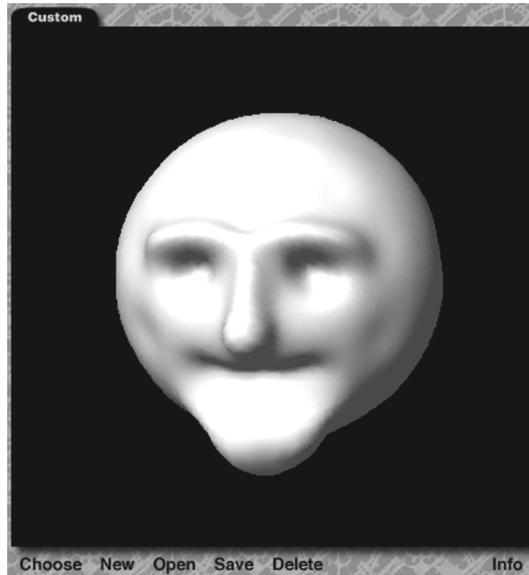


figure 5.10: Completed Cartoon Face

That's just a quick sample of how easy it is with Amorphium to create a caricature. Play around with this idea for a while, get a feel for using different settings for **Pressure** and **Radius**, and perhaps try using the **Smooth** and **Smudge Brush** tools.

5.2 Creating a Mountainscape

Introduction

The purpose of this project is to demonstrate how you can use **HeightShop** to pull out a three-dimensional surface, such as a mountainscape, using a standard shape with a two-dimensional image and then using **Textures** to apply a texture map to the object's surface.

- Starting Out
- Click the **New** button below the 3D workspace and select **Standard Shape** from the menu which appears (figure 5.11).

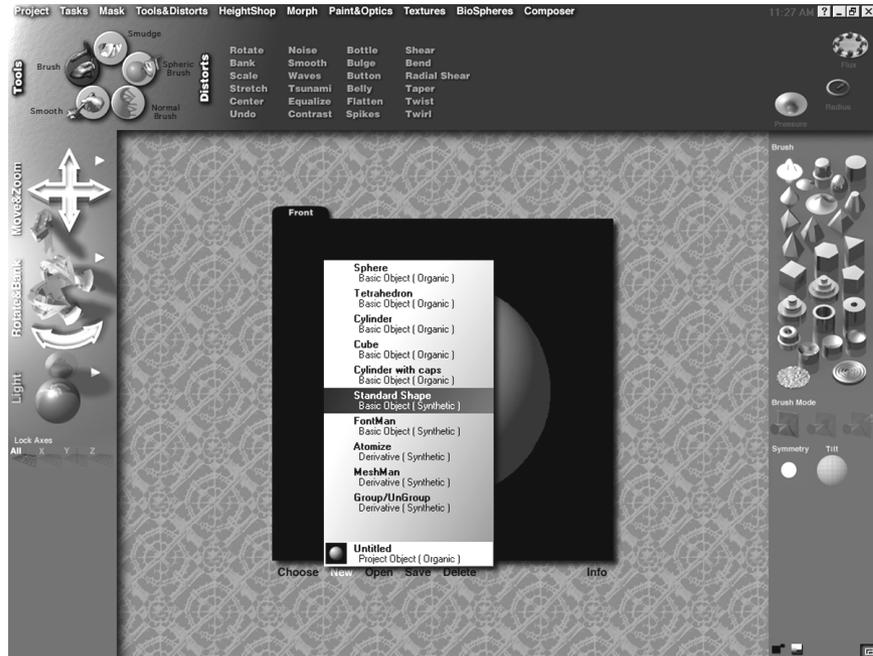


figure 5.11: Selected shape from the new object menu

- Tip
- The object menus below the 3D workspace are accessible from any mode except Composer.

This will open the Standard Shape Panel (figure 5.12).

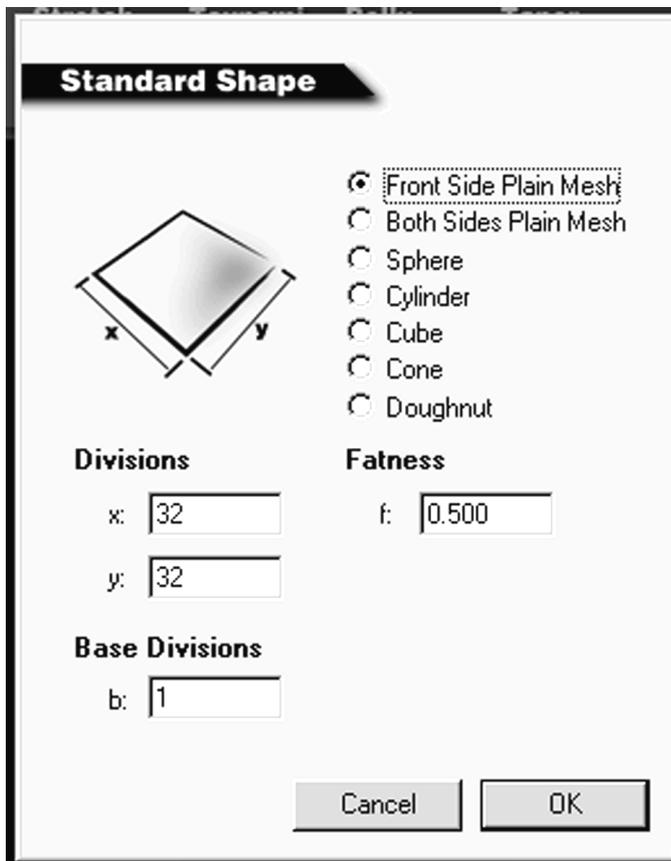


figure 5.12: The Standard Shape Panel

Select the following options:

- **Front Side Plain Mesh**, which is a simple flat square.
- Since a mountainscape involve lots of detail, we'll increase the **X and Y Divisions** from 32 to **96**.

This has the effect of increasing the number of polygons from which the surface is constructed.

- Click **OK** and a flat square is created in the 3D workspace (*figure 5.13*).

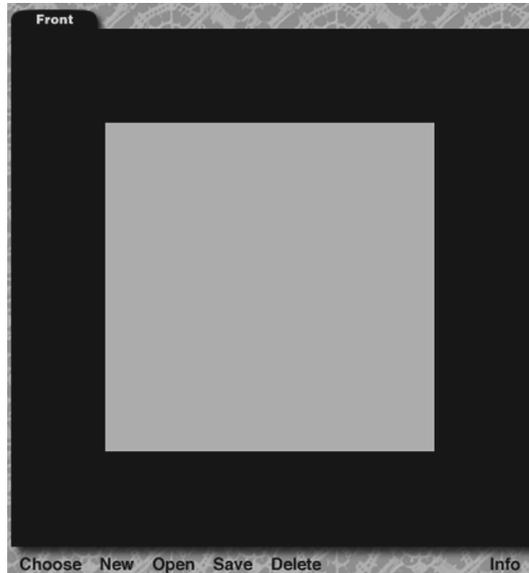


figure 5.13: The Beginning of the Mountainscape

Tip: **Front Side Flat Meshes** have only one side. They will disappear from behind (in views other than **Front** or **Custom**).

Pulling Out the Surfaces

Now it's time to cause a little geological upheaval on this highly uninteresting flat landscape.

- Click the HeightShop button from the top of the scene (figure 5.14).

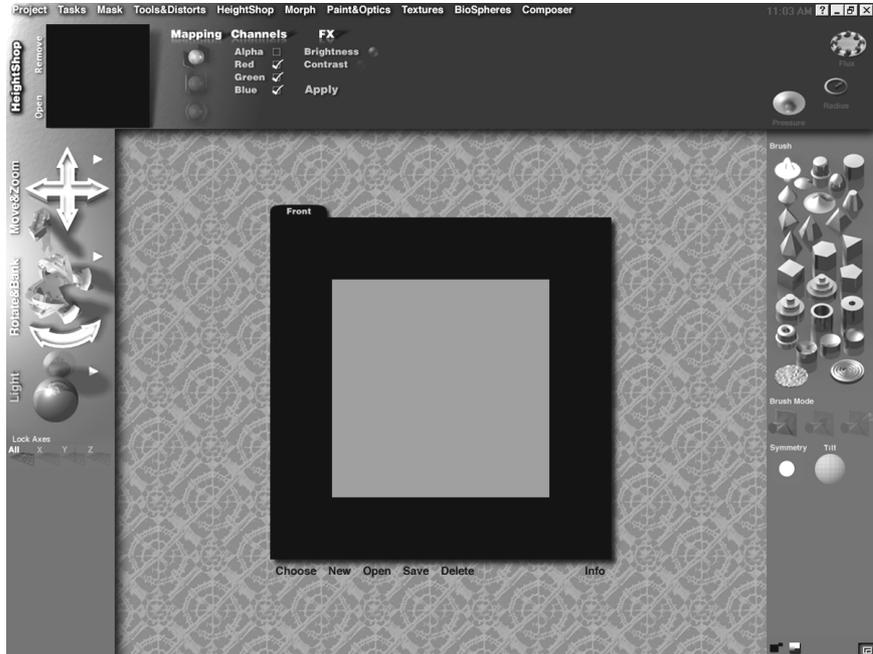


figure 5.14: The Mountainscape in the HeightShop Workspace

A selection of two-dimensional images, including mountain topography, have been provided for you with Amorphium.

- Click the **Open** button next to the **Current HeightShop Image** (figure 5.15).

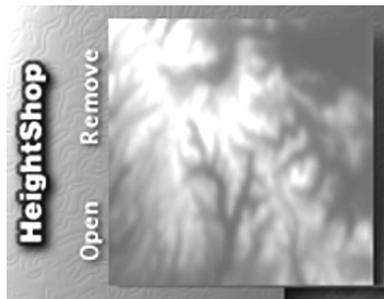


figure 5.15: The MtTopo Image as Current HeightShop Image

- Navigate to Amorphium's **HeightShop** folder, then select the **MtTopo** image.
- To pull out the surface of the flat square based on the two-dimensional image, click the **Apply** button (figure 5.16).



figure 5.16: Applying the HeightShop Image

- Drag the mouse to the right until the **Apply** value is **100%** (figure 5.17).

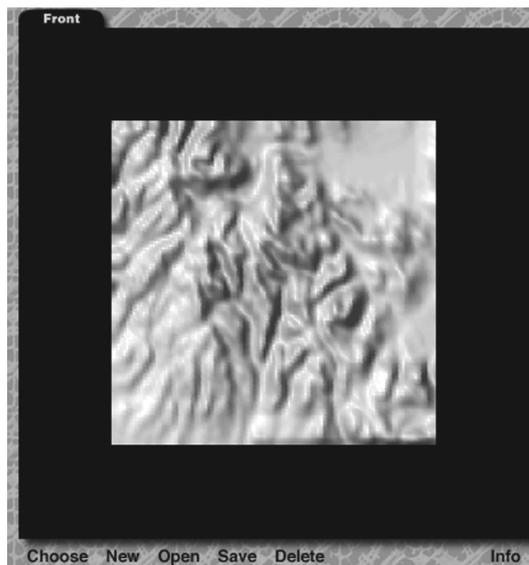


figure 5.17: The Mountainscape Takes Shape

Painting the Mountainscape

Now we're getting somewhere! Now let's add some color to the map by painting it with a texture.

- Click the **Textures** button at the top of the screen (figure 5.18).

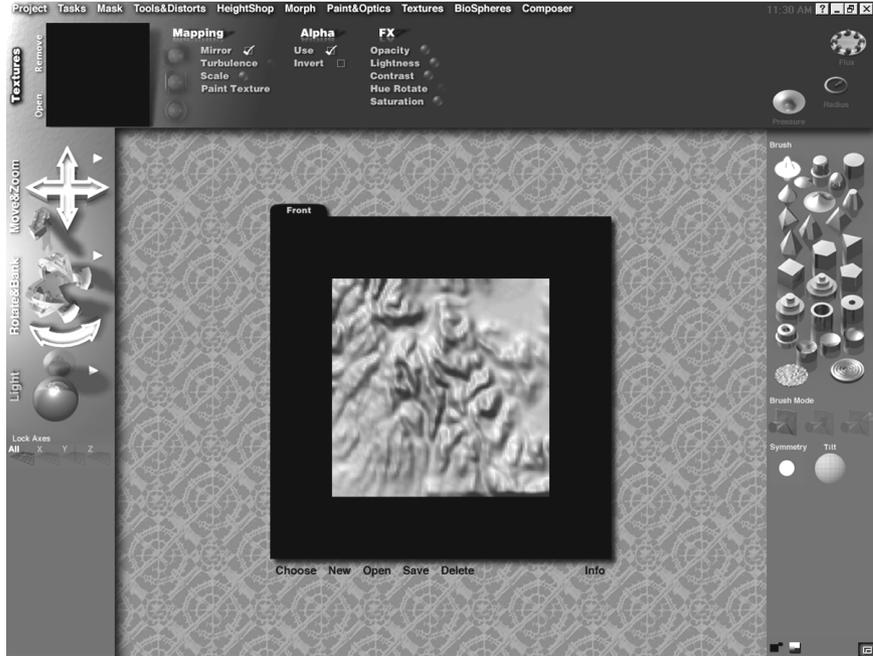


figure 5.18: The Mountainscape Ready for Painting

Conveniently, we can use the same image for the texture as we did for the height map.

- .Click the **Open** button next to the **Current Texture** (figure 5.19).

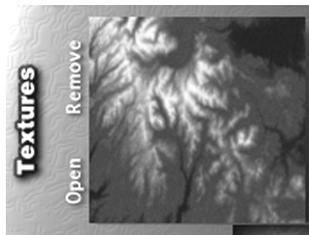


figure 5.19: MtTopo Image as the Current Texture

- Navigate to Amorphium's **Textures** folder, then select the **MtTopo** image.
- Click **OK** to open the image and apply the texture to the mountainscape, creating colorful mountains, valleys, and lakes on our now-3D surface (figure 5.20).

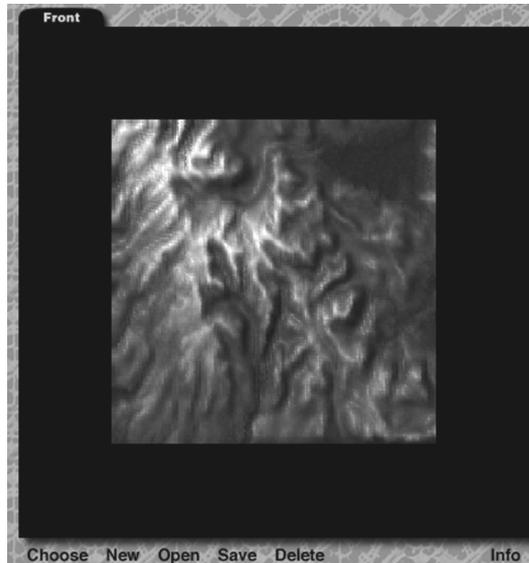


figure 5.20: Texture Applied to the Mountainscape

- To paint the surface of an object while the texture is applied, click the **Paint Texture** button (figure 5.21).



figure 5.21: The Paint Texture Button

- Click the **Remove** button next to the **Current Texture**.

The texture will remain on the object, but you will be able to paint on it as well, which is good—who ever heard of mountains without any snow at the peaks?

- Click the **Paint&Optics** button at the top of the screen to open the **Paint&Optics** tools (figure 5.22).



figure 5.22: The Mountainscape Ready for Painting

- Select a suitable color for the snow (we suggest white) and use a large brush **Radius** and low positive brush **Pressure**.
- Click on the Mountainscape and make it snow!

For illustration, we dusted all the mountain tops with a blizzard's worth of snow (figure 5.23).

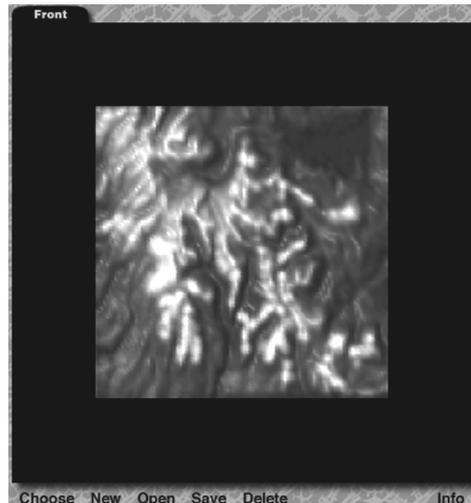


figure 5.23: Snowboarding Anyone?

- **Rotate** the map to get a perspective view of the Mountainscape (figure 5.24).

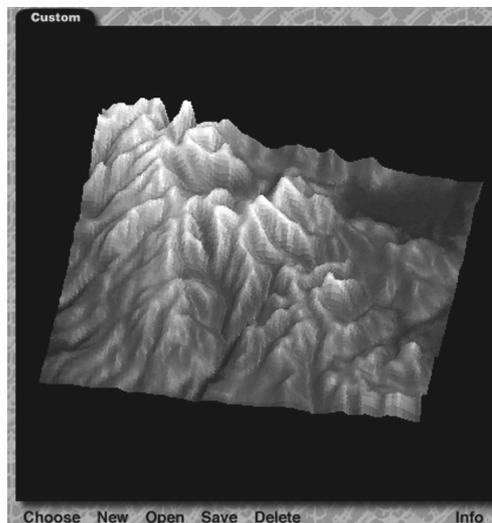


figure 5.24: The Finished Mountainscape



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Chapter 6: Sculpting a Flower

6.1 Flower Project

Getting Started

The first thing we will need for this project is a basic Sphere. By default, Amorphium loads just such a sphere into the workspace when you start up. If for some reason, there is no sphere in the workspace, you'll need to create one first.

- Under the 3D workspace, click on **New** menu and select **Sphere**.

You should see a sphere in the 3D workspace (*figure 6.1*).

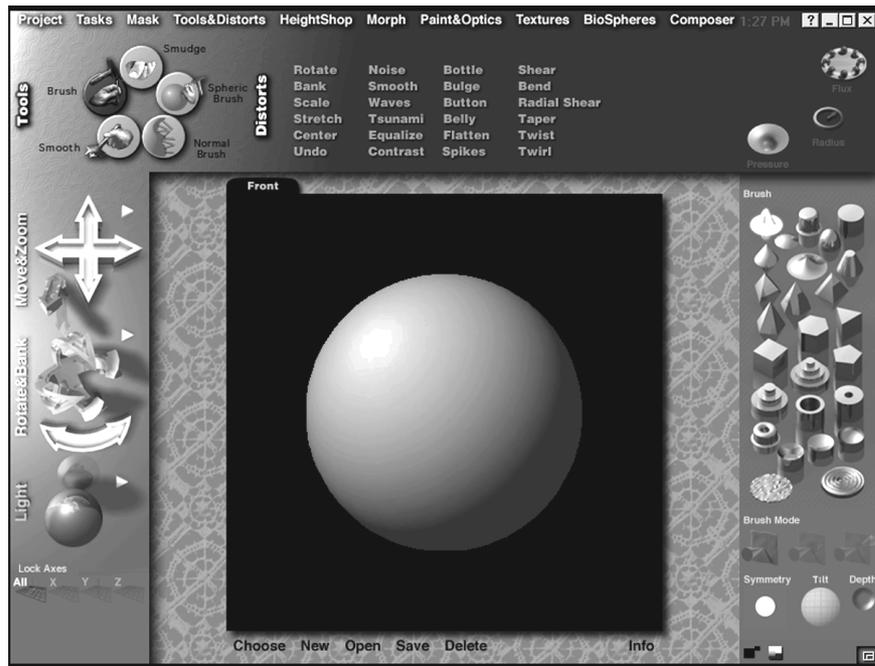


figure 6.1: Standard Sphere in the 3D Workspace

6.2 Tools of the Trade

If you're not in Tools&Distorts mode, go there now.

- Click the **Tools&Distorts** button at the top of the screen (*figure 6.2*) to display Amorphium's tools and distorts.



figure 6.2: The Tools&Distorts Button

By starting with a shape primitive (like a sphere), and working it over with Amorphium's brushes and distorts, you will be able to create just about any object imaginable.

Experiment! In the course of these projects, we'll create things a certain way—just remember that there are many paths to the same goal. You'll develop your own tricks and techniques as you work with Amorphium. Feel free to experiment!

Save Your Work After each step, save the object. If you make a mistake or don't like how the flower is taking shape, you can begin again with the previously saved object.

6.3 Sculpting with Symmetry

Since we all value our time, we can take advantage of one of nature's properties to multiply our effort: Symmetry. The petals of a flower are arranged symmetrically, in this case around a center point, so we can sculpt several petals at once.

Locate the symmetry button below the collection of brush shapes. This button resembles the type of symmetry currently selected. With symmetry off, it looks like a white dot (*figure 6.3*).

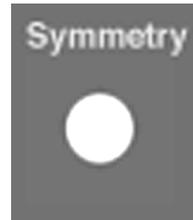


figure 6.3: Symmetry Button with Symmetry Off

- Click on the **Symmetry** button until the Symmetry Options appear (*figure 6.4*).



figure 6.4: The Symmetry Options

Clicking on one of the symmetrical patterns will modify the behavior of your brush tool. With a single brush stroke, you can produce multiple brush strokes in the shape of the selected pattern. Happily, this is very convenient for drawing flowers..

- Click on the Six-point Swirl symmetrical pattern (figure 6.5).



figure 6.5: Brush Symmetry Set to Six-point Swirl

If you look at a flower, you'll notice that all the petals radiate from a center point.

- Select the **Spheric** brush tool.

This is very important. We need to use the Spheric brush tool because it pushes the surface toward the center of the sphere as you brush.

For now, we'll stick with Amorphium's default **Brush**, the one with the small tapered point, with a medium brush radius and medium negative brush pressure.

- With your brush point over the sphere and slightly off the center, push into the surface and draw the shape a flower petal, retracing your movement to get more definition (*figure 6.6a*).

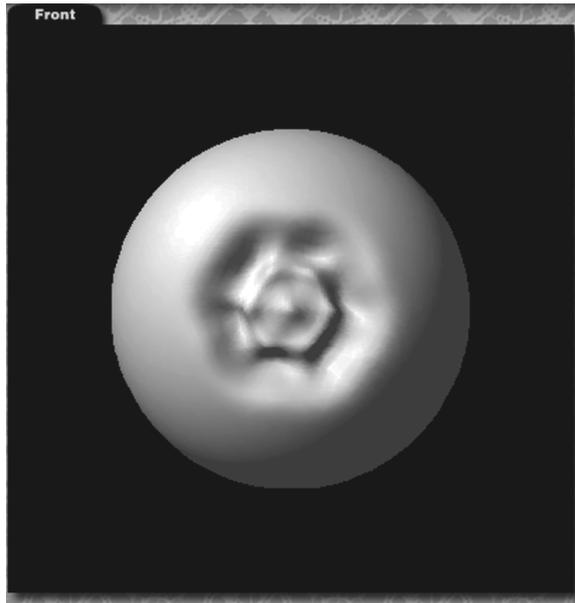


figure 6.6a: Sculpting the Inner Petals

Five other petals are drawn at the same time and things can get confusing. If you don't like the looks of it,

- Press (**Ctrl-z**) on the PC or (**Apple Key-z**) on the Mac to undo the stroke and try again.

When you get the hang of it, move your brush point between petals and begin sculpting the next row (*figure 6.6b*).

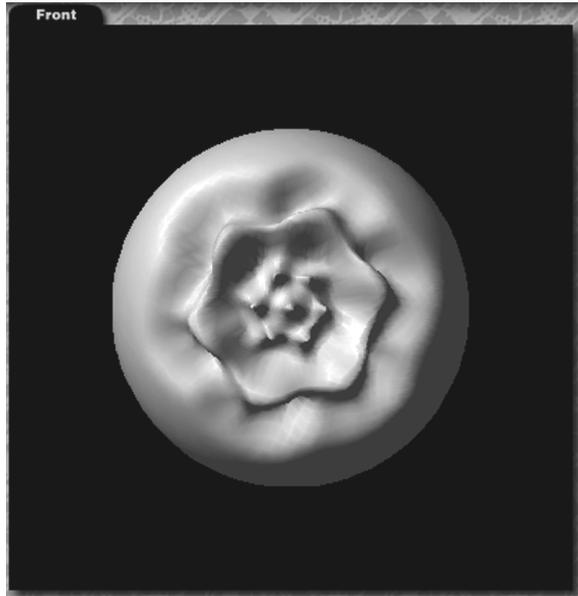


figure 6.6b: Sculpting the Next Row of Petals

Keep repeating this process, each time moving a little further away from the center of the sphere. In this example, we ended up with five rows of petals, but you can use more or fewer as you desire.

Make sure you make the outer petals a little bigger, for this is the nature of flowers.

When you're done, your flower should resemble this one (*figure 6.7*).

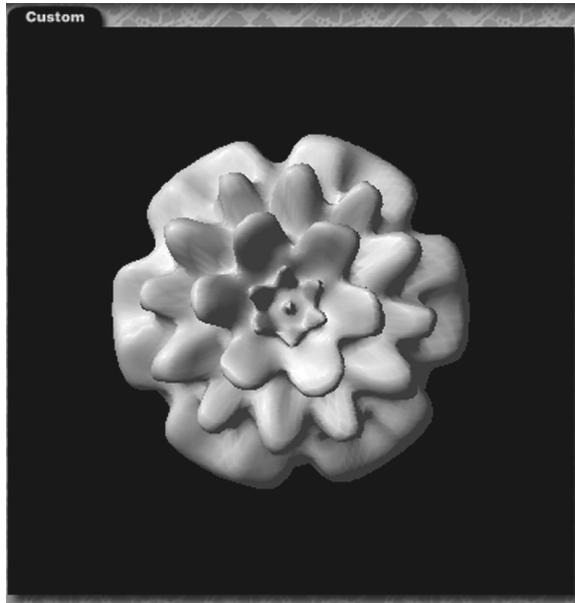


figure 6.7: Top View of Sculpted Flower

If you're satisfied with your results, we can get on to the rest of the flower.

6.4 Create the Stem

Creating a stem for the flower involves pushing, pulling, smoothing, smudging, and smoothing some more. The first thing we'll need to do, however, is to turn off Symmetry

Click the **Symmetry** button, which currently shows the six-point symmetry icon, and select **Symmetry Off** (the solid white dot).

We'll need to look at the flower from a different view to sculpt the stem.

- Rotate the flower so the petals are oriented towards the top of the screen (*figure 6.8*).

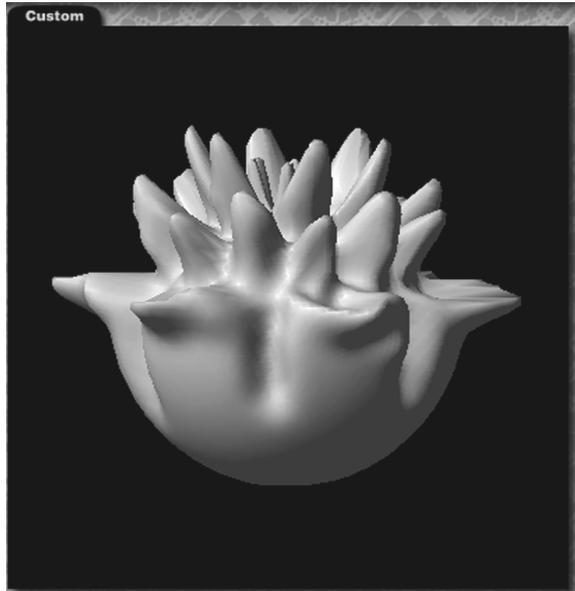


figure 6.8: Side View of flower

Again we'll stick with the **Spheric** brush tool, but use a larger brush radius and medium to high negative pressure.

- Starting below the petals, sculpt the beginning of the stem, rotating the flower as necessary for the first step, which should result in a knobby shape (figure 6.9).



figure 6.9: First Step for the Stem

The next step will be to lengthen out the stem, and give it its real shape.

- Rotate the flower so you are looking at its underside, with the stem is facing you (figure 6.10).

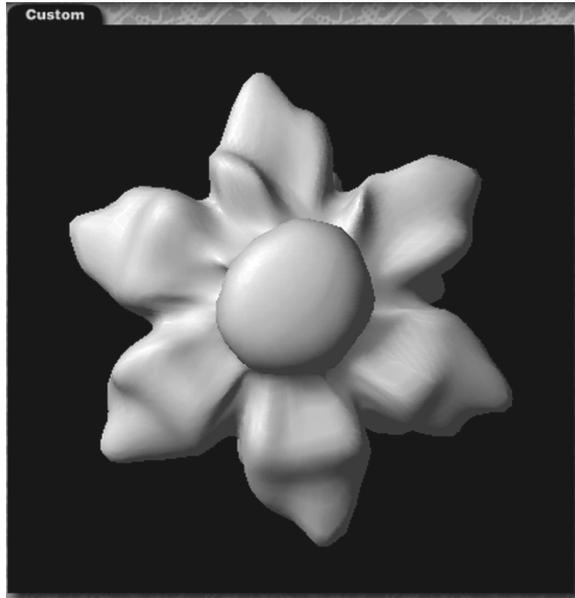


figure 6.10: Rotate the Stem Towards You (Underside of Flower)

Now we want to pull on the stem, and to do that, we'll switch from **Negative Brush Pressure** to **Positive Brush Pressure**. We'll also change the **Brush Radius**.

If you need to, use the **Move** tool to center the flower in the 3D workspace, then:

- Set the **Brush Radius** to roughly the same diameter as the knob.

Adjust brush pressure to pull out at medium to high positive pressure.

- Position the brush pointer over the knob and pull out the stem by clicking on it a few times.
- **Rotate** the flower as necessary to check your progress.

The stem should now look a bit like a cone (*figure 6.11*).

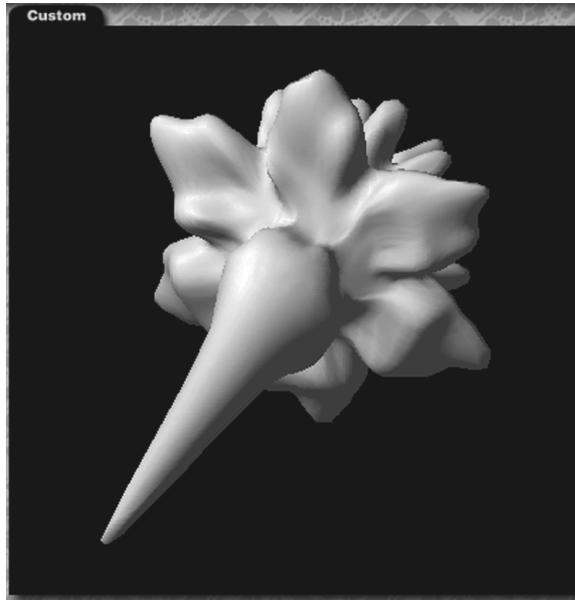


figure 6.11: The Stem Takes Shape

At this point, you might find some rough edges where the stem meets the flower. Fortunately, Amorphium's got the tools to deal with rough edges.

- Select the **Smooth** brush tool with medium **Negative Brush Pressure** and a medium **Brush Radius** to smooth away any rough edges.

Let's continue shaping the stem.

- Select the **Brush** tool with a large **Brush Radius** and medium **Negative Brush Pressure** and really flatten out the stem (*figure 6.12*).

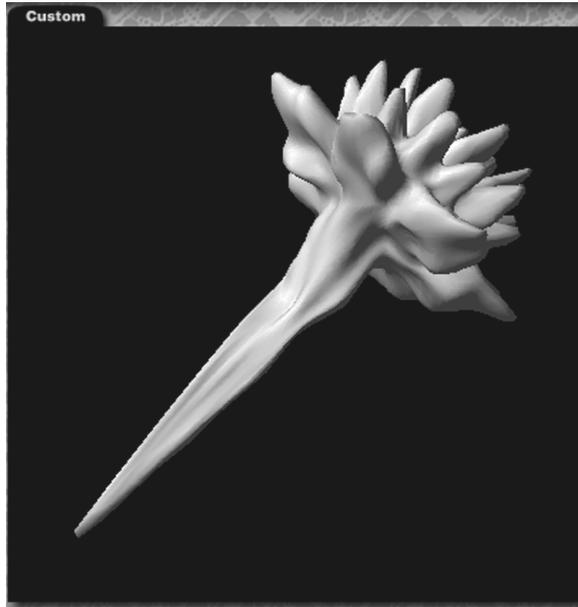


figure 6.12: Flattening the Stem

- If necessary, again select the **Smooth** brush tool with medium **Negative Brush Pressure** and a medium **Brush Radius** to smooth away any rough edges.

We're almost there, we just need to add a little more length and character to the stem. We'll try the **Smudge** brush tool to do it. Smudging is like pulling clay with your finger.

Move the pointer to the tip of the stem, click and hold the mouse button, and pull from there. If you wish, you can even give the stem a slight bend (*figure 16.13*).

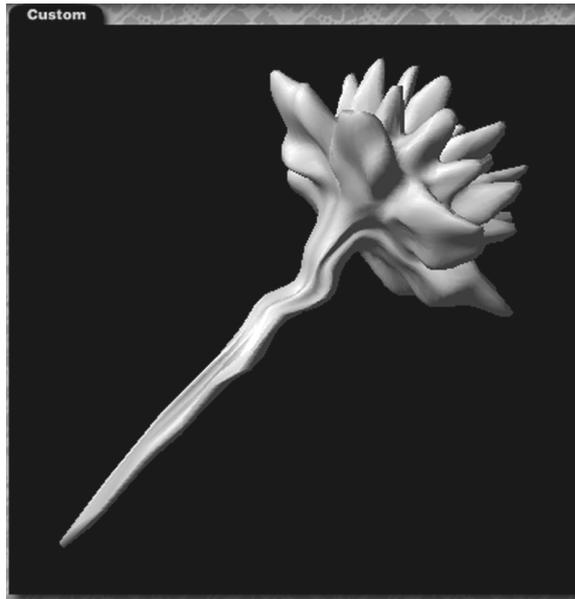


figure 6.13: Stem after Smudging

Now we'll turn our attention back to the petals. We'll turn that bottom row of petals into leaves.

- **Rotate** the flower object in the 3D workspace so you can see the stem and the bottom row of petals.

To separate the leaves,

- Select the **Brush** tool and medium **Brush Radius** and low **Negative Brush Pressure**, and sculpt into the surface of the flower between the edges and toward the stem (figure 6.14).

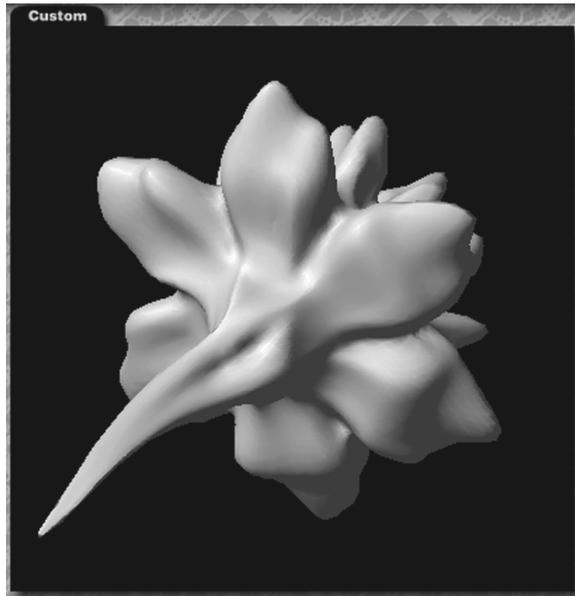


figure 6.14: Creating the Leaves

- Change to the **Smooth** brush tool to smooth out any rough edges. We'll continue at this point to separate the leaves and petals.

- Select the **Spheric** brush tool, this time with a smaller **Brush Radius** and low **Negative Brush Pressure**, and separate and flatten the petals and leaves (figure 6.15).

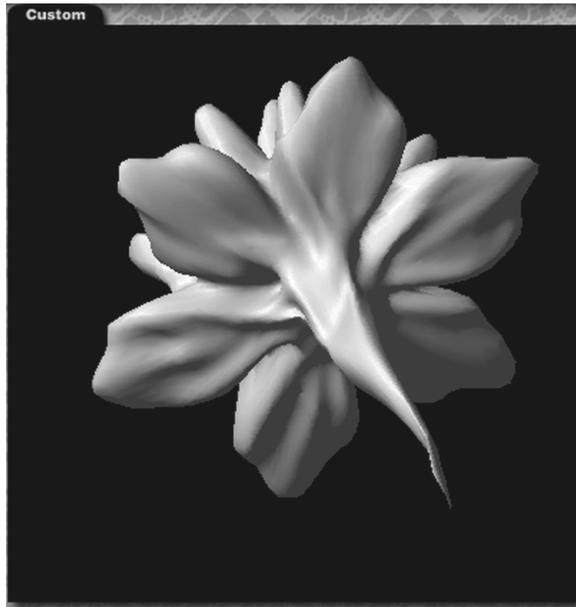


figure 6.15: Continuing with the Leaves & Petals

When we have the separation and shapes of the petals and leaves we want, we need to give them some curvature, because who ever heard of a flat flower?

To give the petals and leaves curvature, we used the Spheric brush tool and default brush shape, but with a small brush radius and very low negative brush pressure, and imagined a line running down the middle of each petal or

leaf. We moved the brush pointer from this line toward the edge and dished out the petal (*figure 6.16*).



figure 6.16: Close-up of Flower Showing Curvature of Petals and Leaves

Finally, we changed to a medium brush radius with medium positive brush pressure and pulled out the tips of the leaves (*figure 6.17*).

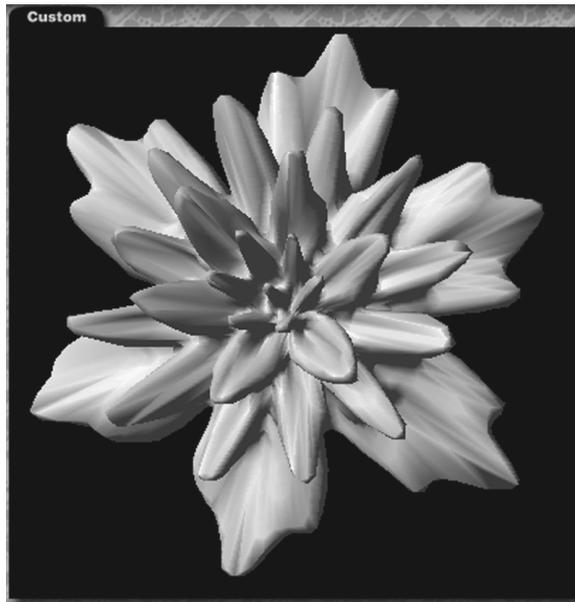


figure 6.17: Flower with Tips of Leaves Pulled Out

6.5 Paint the Flower

From Tools&Distorts mode:

- Click on **Paint&Optics** from the main Amorphium menu at the top of the screen.

Our paint mixers have spent countless hours perfecting Amorphium blue, but we wanted a red flower with a green stem.

- Drag the eyedropper over the color red on the color ramp and click.
- Click on the **Paint Bucket** to the right of the mask.

Good-bye Amorphium blue. Earl Scheib couldn't have done better (figure 6.18).

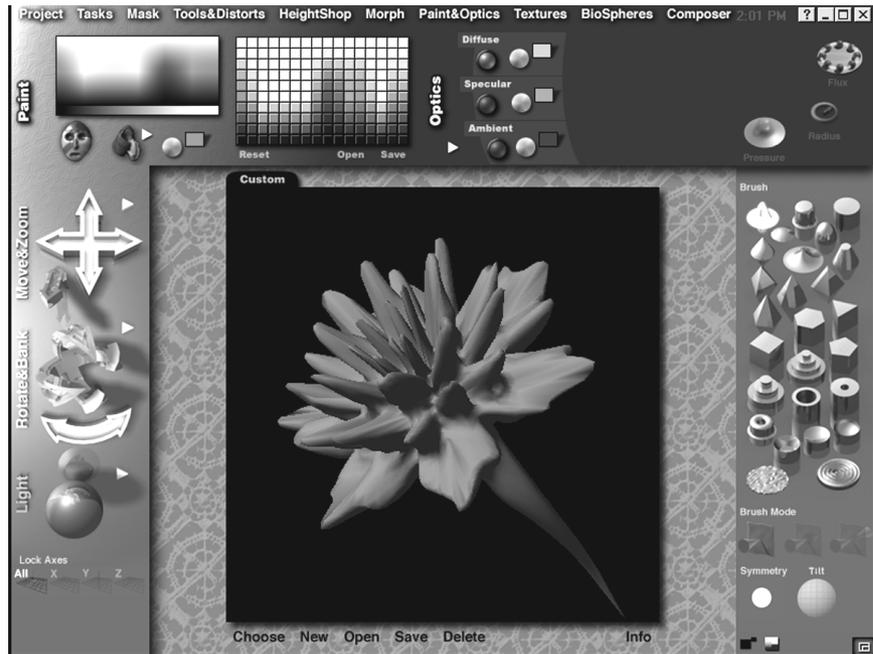


figure 6.18: The Flower after Painting

Now, let's paint the leaves and the stem green.

- Drag the eyedropper over the color green on the color ramp and click.
- Click on **Brush** from the collection of Tools.

We used a medium brush radius with medium negative brush pressure and began painting the stem and leaves of the flower. It's just like airbrushing (*figure 6.19*).



figure 6.19: Leaves and Stem with Partial Paint Job

We went to a smaller brush radius and rotated the object to paint all the surfaces of the leaves and the stem (*figure 6.20*).

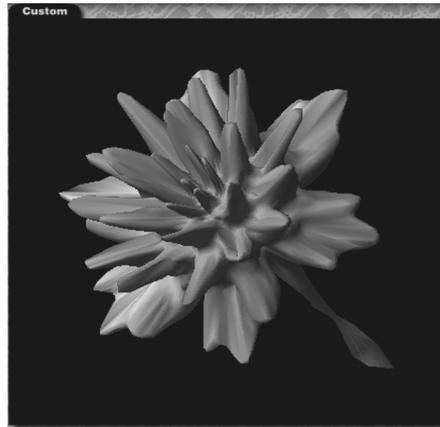


figure 6.20: The Finished Flower

When you're done, don't forget to save your flower.

Chapter 7: Sculpting a Skull

7.1 Introduction

When our team of Shakespearian scholars got their hands on Amorphium, we didn't know what to expect. But alas, poor Yorick would be impressed how they used Amorphium's brush tools and the advanced feature of sculpting symmetrical patterns with a single brush stroke to create a 3D skull out of a sphere. We thought you'd like to know how they did it. No jest.

7.2 Getting Started

The first thing you need for this project is a basic Sphere. By default, Amorphium loads a sphere into the Tools&Distorts workspace when you start up. If for some reason there is no sphere in the workspace, you'll need to create one first.

- Under the 3D workspace, click **New** and select **Sphere** from the menu which appears.

You should see a sphere in the 3D workspace (*figure 7.1*).

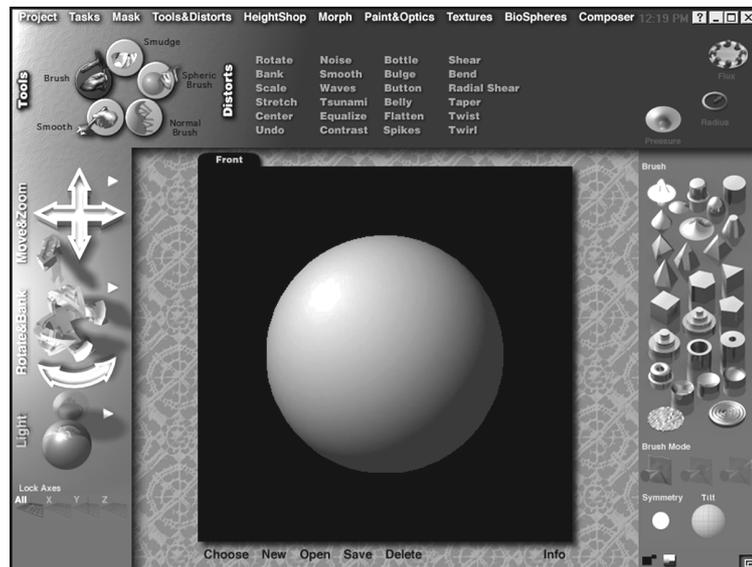


figure 7.1: Plain Old Sphere

If you're not in Tools&Distorts mode, go there now. The sphere will tag along.

- Click the **Tools&Distorts** button (figure 7.2) at the top of the screen to display Amorphium's selection of tools and distorts



figure 7.2: The Tools&Distorts Button

Save Your Work!

Once you begin working with Amorphium, you'll see how easy and fun it is to create objects in 3D. After each project step or when you've created something unbelievably cool, it's a good idea to save the object. Give it a descriptive name too.

Brush Basics

Unless otherwise noted, use the **Spheric Brush** (figure 7.3) tool to sculpt the basic shape of the skull.

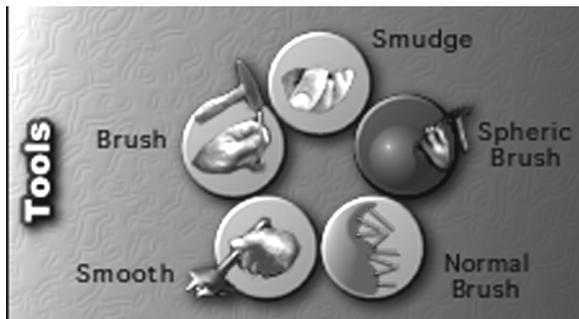


figure 7.3: The Spheric Brush Tool

This tool was designed to work on spheres and using it has the effect of pushing or pulling on the surface towards the center of the sphere.

7.3 Sculpting with Symmetry

Locate the **Symmetry** button below the collection of brush shapes. This button resembles the type of symmetry currently selected. When **Symmetry** is off, it looks like a white dot (figure 7.4).

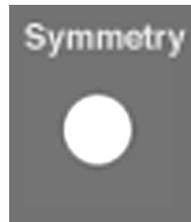


figure 7.4: The Symmetry with Symmetry Off

- Click the **Symmetry** button to display the **Symmetry Options** (figure 7.5).



figure 7.5: The Symmetry Options

Clicking on one of the symmetrical patterns will modify the behavior of your brush tool. If you select one of the polar swirl patterns from the top row, you can produce multiple brush strokes, each stroke radiating from the center of the object. This works well for creating flowers because petals and leaves radiate from the center of the stem, but not so well for sculpting a skull's eye sockets on a sphere. Instead,

- Select the 2-way Mirror option (figure 7.6).

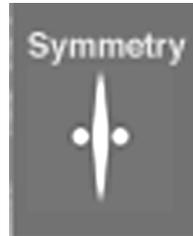


figure 7.6: The Symmetry Button with Two-Way Mirror Symmetry Selected

Now, when you carve out one eye socket, your brush strokes will be mirrored and create the other eye socket simultaneously. It's the equivalent of the four-hour workday. Other split patterns are even more generous, and you should come back and experiment with them.

- Tip** For the best results with symmetrical patterns, make your first brush stroke away from the center point of the object you're working on. Amorphium will then apply simultaneous brush strokes at an equal distance from that point. Holding the pointer over the center point will merge all the strokes in the pattern together and blast away on the surface, creating a nice deep groove if that's what you're after.

7.4 The Eyes Have It

Use Amorphium's default brush shape (top row, left) with a medium negative brush pressure and a medium-small brush radius.

- Place the pointer over either side of the sphere where you want the eye socket to be and click a few times with a slight twist of the wrist. With dou-

ble split symmetry, both sides of the sphere are pushed in simultaneously (figure 7.7).

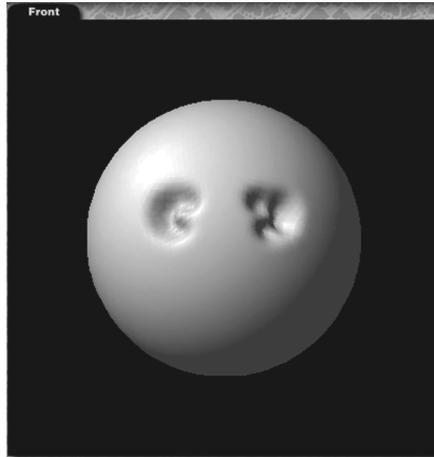


figure 7.7: Carving the Eye Sockets

Now that you've got the hang of it, let's dig a little deeper.

Hold the mouse pointer down and at the same time carve away from the center of the socket (figure 7.8).

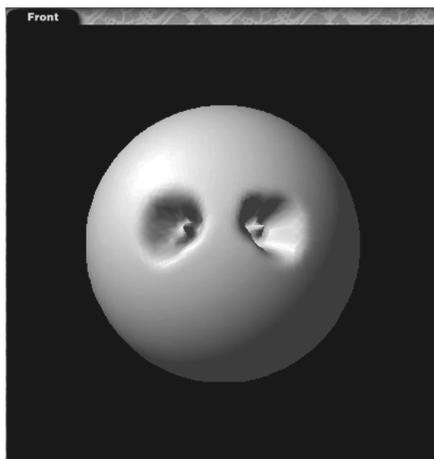


figure 7.8: Finishing the Sockets

7.5 Nose Job

To create the nasal cavity, ease off on the negative brush pressure and give the brush a smaller radius.

- With the pointer placed between and just below the eye sockets, hold down and drag the pointer toward the bottom of the screen (*figure 7.9*).

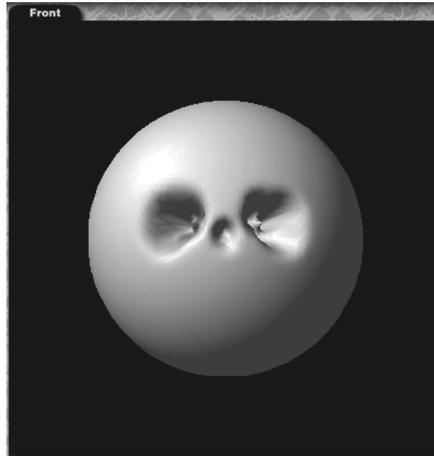


figure 7.9: Carving the Nasal Cavity

A deeper cut is achieved because the double split symmetrical brush strokes merge along the vertical axis running through the sphere's center point.

- Continue dragging the pointer and where the nostrils would be, flare your brush stroke a bit. You'll notice the effect of double split symmetry (figure 7.10).

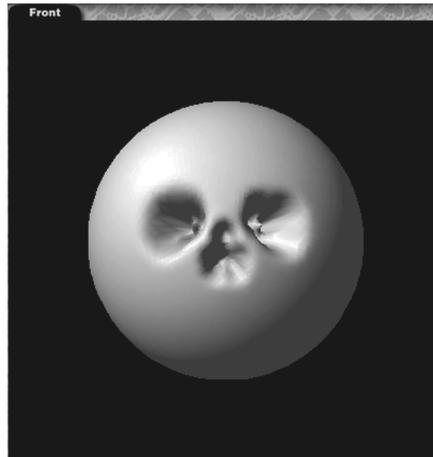


figure 7.10: Finishing the Nasal Cavity

7.6 Shaping the Jaw

Not too bad so far, but somewhat lacking in the jaw department,

- Decrease the brush pressure again, but increase the brush radius.

- Start with the pointer between the sphere and one of the bottom corners of the 3D workspace. Drag the pointer toward the sphere and make some serious indentations (*figure 7.11*).

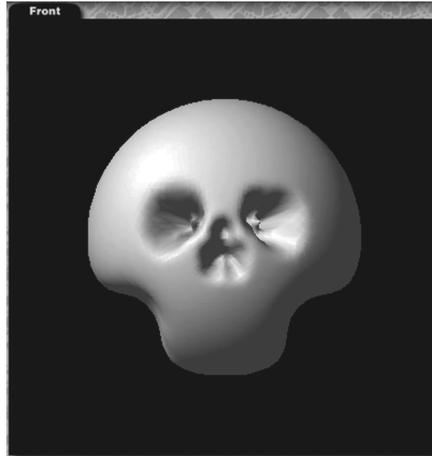


figure 7.11: Shaping the Jaw

Continue working on the bottom area of the sphere until it's completely flat (*figure 7.12*).

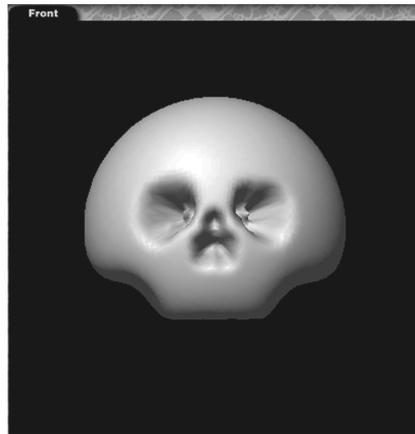


figure 7.12: Finishing the Jaw

- The tops of skulls aren't perfectly round, so push on the surface above one of the eye sockets (*figure 7.13*).

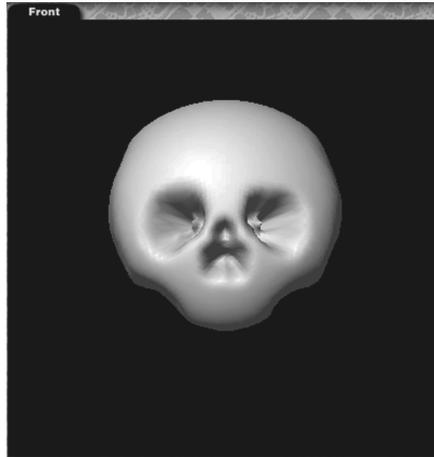


figure 7.13: Carve the Crown

And to indent the temple area, increase the negative brush pressure a bit and reduce the brush radius to medium.

- With the pointer above one socket, click a few times (*figure 7.14*).

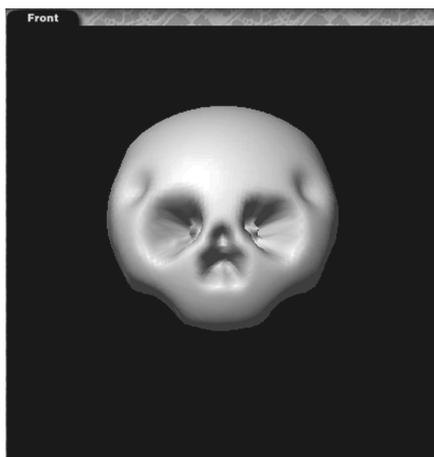


figure 7.14: Working on the Temples

Hold down the pointer and continue to sculpt around the sockets and above the nasal cavity (*figure 7.15*)

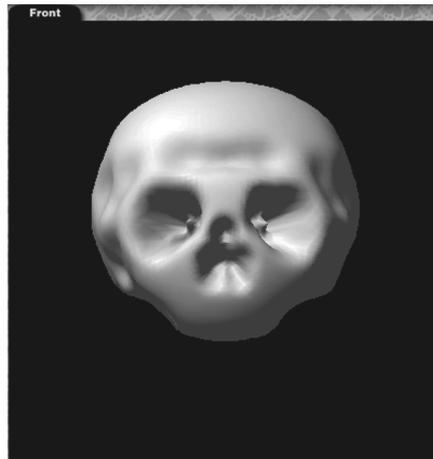


figure 7.15: Finishing the Top

- Rotate the skull so the bottom half is in view.
- Click the **Symmetry** button, and select **Symmetry Off** (*figure 7.4*).
- Increase the negative brush pressure and work with a medium brush radius.

- The skull we created lost its jaw, so begin hollowing out from the center (figure 7.16).

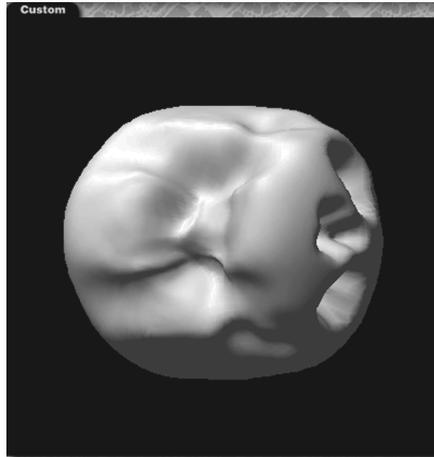


figure 7.16: Shaping the Bottom of the Jaw

- Switch to the **Brush** tool, instead of the **Spheric Brush** tool at this point.

Using the **Brush** tool will push in on the surface of the skull perpendicular to the view point and give the skull's underside some nice deep grooves. Don't worry about the edges, because we'll smooth them next.

- Select the **Smooth** brush tool with a lower negative pressure and a larger brush radius.
- Run your brush over any rough areas of the skull.

- Rotate the skull to check your work (*figure 7.17*).

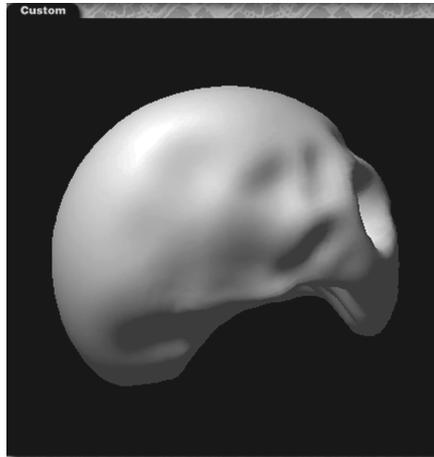


figure 7.17: Polishing Off the Bottom of the Skull

To give the skull a lifetime's worth of bumps,

- Select the **Brush** tool, this time with a low positive brush pressure and a medium brush radius, and just pull across the surface, rotating as necessary to cover the the entire top (*figure 7.18*).

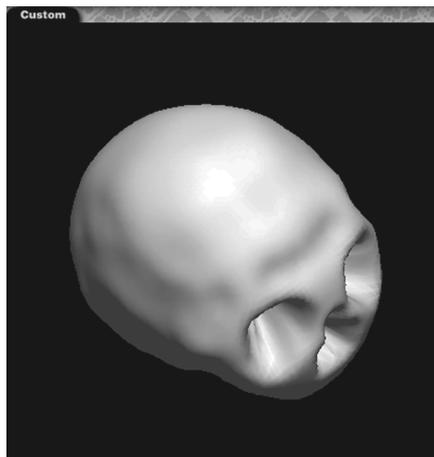


figure 7.18: Bumps and Lumps

The smooth tool is there to help you with any touch-ups.

- Use a combination of the **Brush** tool and the **Smudge** tool to pull out and push in around the eye sockets (*figure 7.19*).

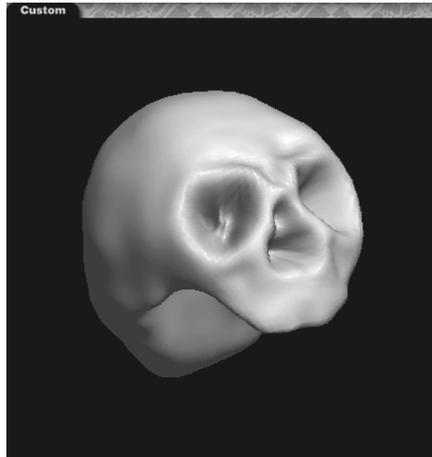


figure 7.19: Detailing around the Sockets

You can even use this combination of brush tools to add teeth (*figure 7.20*).

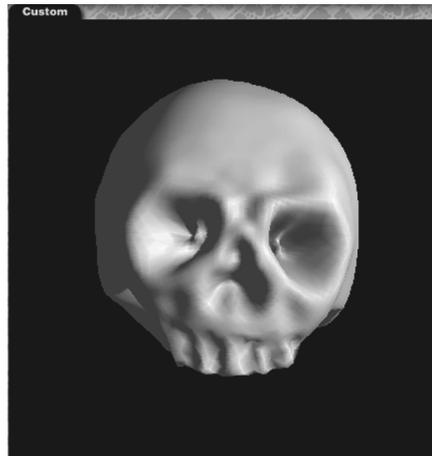


figure 7.20: Adding Teeth

7.7 Painting the Skull

Let's give this skull a realistic color before we call it done.

Click on **Paint&Optics** button at the top of the screen.

This will open the **Paint&Optics** tools, with the skull in the 3D workspace (*figure 7.21*).

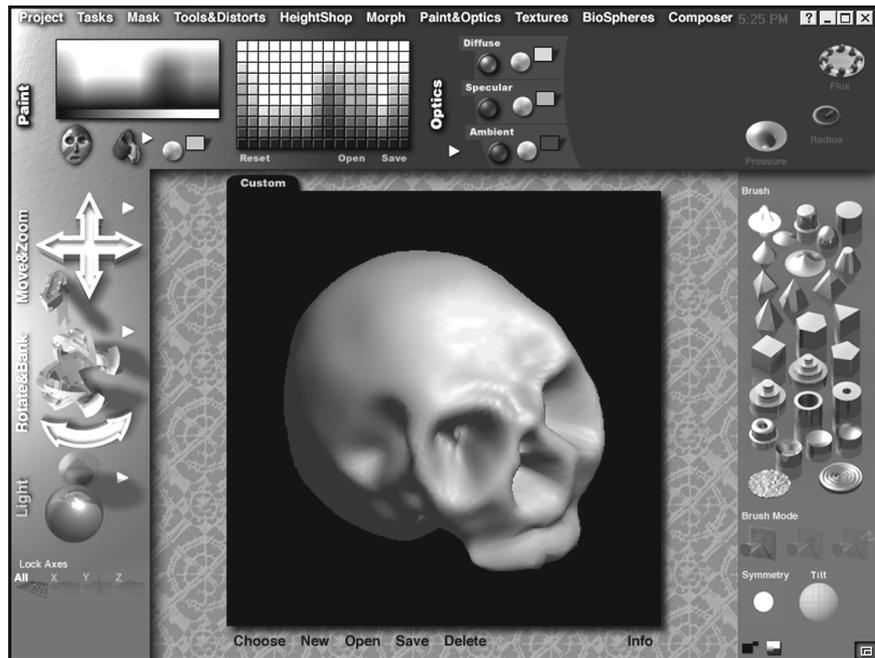


figure 7.21: The Skull Ready to Paint

- Drag the pointer over the color ramp, and select an off-white color.
- Click on the **Paint Bucket** to the right of the mask to paint the entire skull.

Now, to give your skull some natural discoloration,

- Drag the pointer over the color ramp and select a shade of gray not too far from the bony white color you used.

Next to the **Paint Bucket**, you'll find a white triangle.

- Click on the triangle to bring up a menu of Paint Effects (*figure 7.22*).

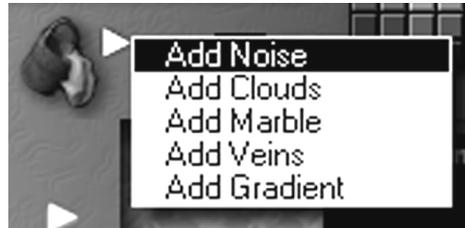


figure 7.22: The Paint Effects Menu

These effects can be applied to the object, and they will use the current color in the **Paint Bucket**.

- To discolor the surface of the skull with a shade of gray, click on **Add Noise**. You should now see the completed skull in the 3D workspace (*figure 7.22*).

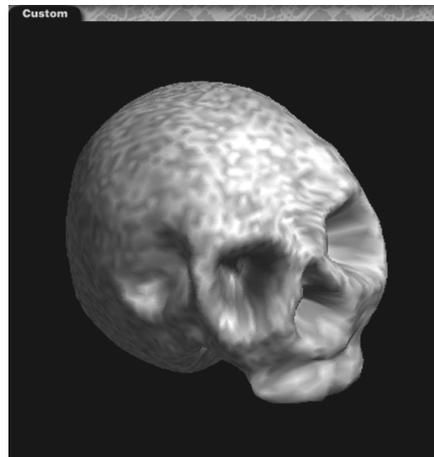


figure 7.23: The Finished Skull

Your skull should please even the Prince of Denmark. We jest not.

Chapter 8: BioSpheres Modeling

8.1 Biospheres

Introduction

BioSpheres are energetic balls, or perhaps blobs with attitude. The more positively charged they are, the more attractive they become to each other. Negatively charged, they push away from the crowd. Biospheres can be flattened and fattened and joined together to create shapes you couldn't make any other way. Look at your hand. Can you imagine sculpting it from one of Amorphium's organic shapes like the sphere? It would be very time-consuming. With BioSpheres, you can make any shape, including an alien hand like we did, in no time at all.

8.2 Getting Started

We'll be working in the BioSpheres workspace for the first part of this project, so if you're not already in BioSpheres mode, go there now.

- Click the **BioSpheres** button at the top of the screen.

You'll greeted by the BioSpheres workspace, which will be empty. Normal Amorphium objects are not used here, and won't appear—if you had a sphere in the workspace, for example, it will be waiting for you when you exit BioSpheres

To create a BioSphere,

- Click the **New** button found under the BioSpheres workspace.

A blue, blobby looking sphere should appear in the center of the workspace (*figure 8.1*).

You should also note that the BioSphere will have a green “T” shaped object at its center. These three green lines are the **Properties Handles**, and they appear only on the currently selected BioSphere.

You will also note the green BioSphere at the top of the Amorphium screen. This functions like the Properties Handles on the selected BioSphere, and you might prefer using it instead. The choice is yours.

- Click the **New** button again to add a second BioSphere.

It may look like nothing happened, but that's because the new BioSphere is added directly on top of the currently selected one

BioSpheres are fairly uninteresting unless there are more than one of them about. It is the interactions between the BioSpheres that make them such powerful modeling tools.

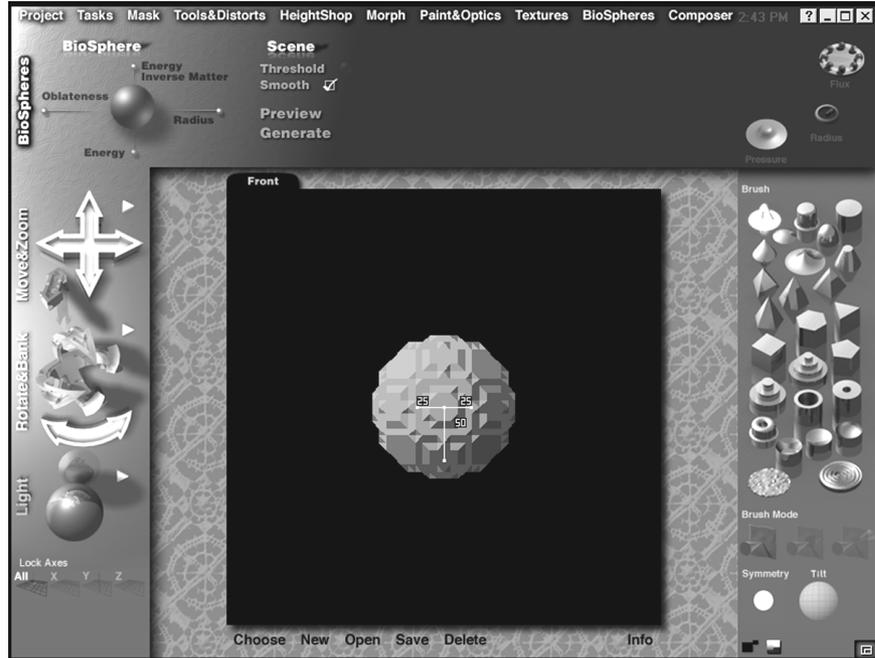


figure 8.1: A BioSphere Displaying the Properties Handles

8.3 Creating the Palm

Now that we have the first two BioSpheres in the workspace, we can move them around a bit and observe the results.

- Click on the center of the BioSphere with the Properties Handles at the Point where the 3 green lines meet.

Now that you have a hold of one of the BioSpheres, you can move it around.

- Drag the BioSphere by moving the mouse, paying attention to both the way it moves, and how the other BioSphere responds.
- Keep moving the two BioSpheres until they are separated (*figure 8.2*).

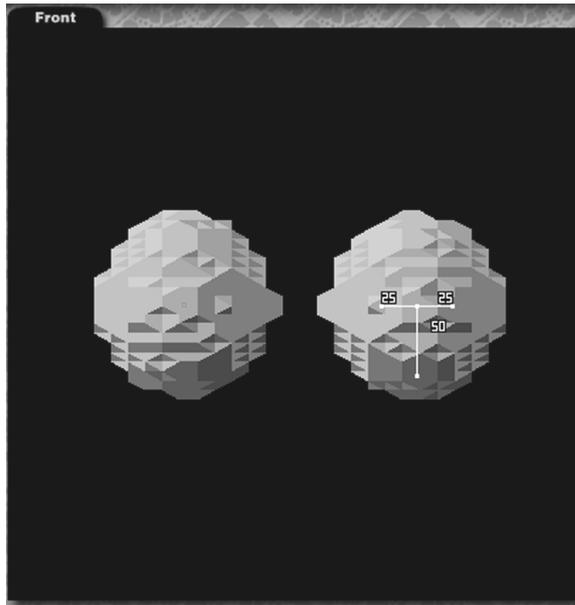


figure 8.2: The Two BioSpheres Separated.

Notice that the other BioSphere has a red dot at its center. To select it,

- Click on the red dot.

The **Properties Handles** will now appear on the BioSphere you just clicked, and the other BioSphere will now show a red dot.

Only one BioSphere at a time can be selected, and consequently have its properties changed.

Now that we can move and select from among multiple BioSpheres at will, its time to start building the base of the hand—the palm.

- Move both BioSpheres to the lower right corner of the workspace, positioning them so that they are just touching. (*figure 8.3*).

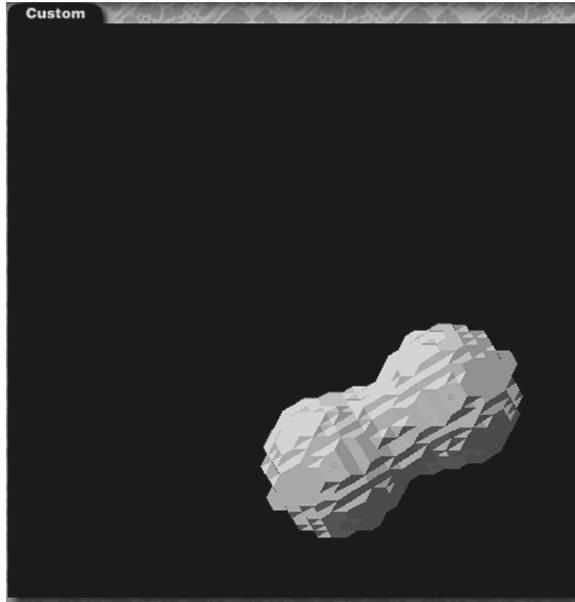


figure 8.3: Starting the Palm.

To complete the palm,

- Add **six** new BioSpheres to the workspace.

As you add the new BioSpheres,

- Position them on top of the first two in two rows of three BioSpheres, each as shown (*figure 8.4*).

At this point, you should experiment with the Properties Handles on the BioSpheres.

The handle on the left controls the **Oblateness** (flatness of the BioSphere), the one on the right controls the **Radius**, and the one on the bottom controls the **Energy**.

To change the value of any of the handles click on it and drag. The handle will grow longer or shorter in proportion to the value of the property, and the number beside it will change to reflect the new value.

As you adjust the Properties Handles, watch both how the BioSphere you are editing and those around it respond.

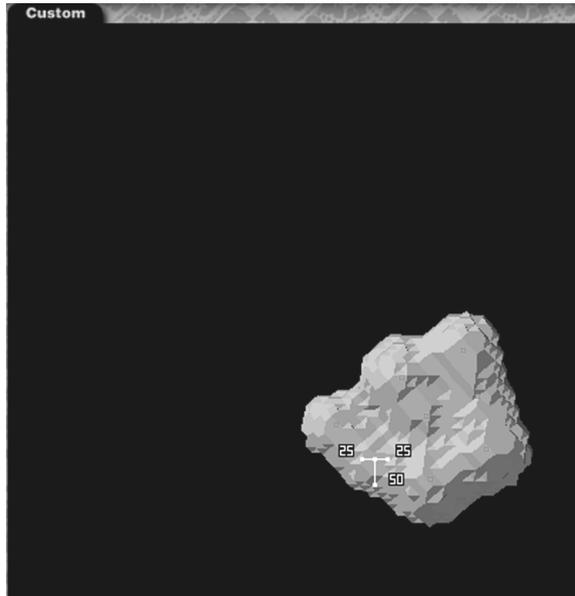


figure 8.4: The Basic Palm Shape.

Now that we have created the basic palm shape, it's a good time to save this BioSpheres object.

- Click the **Save** button below the BioSpheres workspace.
- Type in a name for this object, such as **AlienHand**, then click **Save**.

8.4 Adding Fingers and a Thumb

To create the alien's fingers and thumb as we did, you'll continue adding new biospheres to the palm, pulling, shaping, and bending as you go.

For the fingers, attach four new BioSpheres to each of the three protruding BioSpheres on the palm (figure 8.5).



figure 8.5: biosphere model of palm with fingers.

The first three BioSpheres of each finger should be smaller than those in the palm, and the BioSphere at the tip of each finger should be more round.

To make a BioSphere smaller, decrease its **Radius** and **Energy**.

For the thumb, we attached three new BioSpheres to the bottom left side of the palm (figure 8.6).



figure 8.6: The Hand with Thumb and Fingers Added.

Now that we have a fairly rough outline of the hand, we should save our work again. That means that we will be able to come back to the hand in this condition if we need to make changes later.

- Click the **Save** button below the BioSpheres workspace.

8.5 Generating the Hand

At this point, you'll notice that the hand doesn't look much like any of the other Amorphium objects you may have seen. That's because it isn't—at least not yet.

BioSpheres objects must be turned into normal Amorphium objects before you can sculpt them with the other tools or paint them.

In this case, it would also be helpful for us to look at the hand as it will appear as an Amorphium object, and for that we will use the **Preview** command.

With Preview, BioSpheres mode will let you see what the current model will look like as an object (*figure 8.7*),

- Click on **Preview**, located under **Scene** to the right of the BioSphere Controls.



figure 8.7: A Preview of the Hand

This preview is not an object, just a picture of what the object would look like from this view. When you are finished looking at the preview

- Click the mouse button anywhere on the Amorphium screen to display the BioSpheres workspace again

After looking at the preview, you might decide that you want to go back and edit some of the BioSpheres. You can preview and adjust as many times as you like.

When you are ready, you can create an Amorphium model of the alien hand so you can put Amorphium's powerful tools, distorts, and paint features to work.

- Click on **Generate**, located under **Scene** to the right of the BioSphere Control

You should now see the hand as a model in the workspace (*figure 8.8*).



figure 8.8: The Hand Generated as an Object

8.6 Detailing the Hand

Once we generated the alien hand as a 3D object, we used Tools&Distorts mode to shape it. Use the Move and Zoom controls to position the object in the 3D workspace as needed.

- Click the **Tools&Distorts** button at the top of the screen.

You may be thinking that the hand doesn't look much like an alien's yet, but that's OK. We really just needed to get the basic shape from BioSpheres. Now that we've done that, we can turn Amorphium's sculpting tools loose on it.

To smooth and shape the alien fingers,

- Select the Smooth Brush Tool with the default brush shape, a medium brush **Radius**, and low negative brush **Pressure**.
- Run the brush along the length of the fingers and the palm, making sure to leave the tips rounded for detailing, rotating the hand as necessary (*figure 8.9*).



figure 8.9: The Hand After Smoothing

The hand should now be taking on a distinctly alien appearance. We're not done yet, though—

Next,

- Select the **Brush** Tool with a small brush **Radius** and low negative brush **Pressure** to add ridges to the back of the hand between the fingers, rotating the hand if necessary (*figure 8.10*).

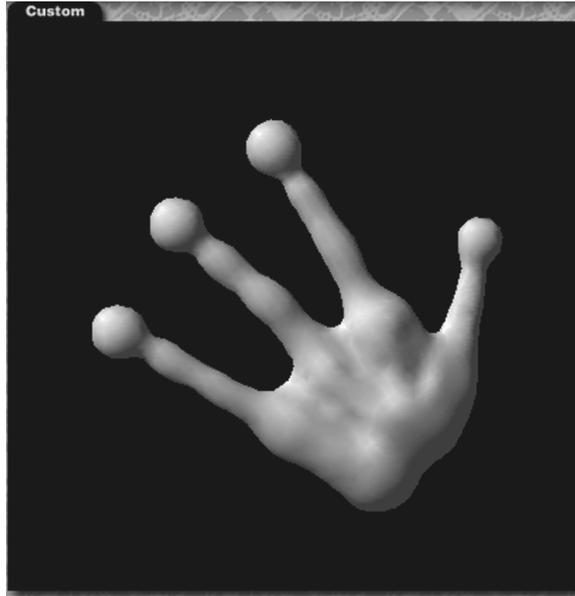


figure 8.10: Adding Ridges to the Back of the Hand

The alien after which this object was created is equipped with suction cups at the end of its fingers (trust us, we've shaken hands with her), so we'll add them here.

To pull this off properly, we'll need to increase the underlying density of the polygons of the fingertips. We'll do this by combining an advanced feature of MeshMan with Amorphium's Paint&Optics mode. Here's how it works:

MeshMan includes a massively useful feature called **Paint Adaptive** which will let you increase or decrease the polygons in a specific part of an objects based on what color it is painted. MeshMan will add density to areas painted white and subtract density from areas painted black. Areas painted 50% gray, or neutral, will not be affected.

Knowing that, the following steps will make sense:

- Click the **Paint&Optics** button at the top of the screen.

With the alien hand object in the **Paint&Optics** workspace, we need to paint the entire object.

- Click on the **Palette** and drag the pointer to approximately half way along the black to white bar at the bottom and release the mouse button.

The **Current Paint Color** should now be a medium (50%) gray.

- Click the **Paint Bucket**.

The entire hand will be painted with the gray you selected (*figure 8.11*).



figure 8.11: Hand Painted Gray

- Click on the **Palette** again and drag the pointer to the right-most edge of the black-to-white bar at the bottom and release the mouse button..
- With a small brush **Radius** paint the rounded tips of the fingers. Rotate the hand as necessary to paint all of the fingertips.

When the fingertips are painted, we'll need to go back and use the Tools&Distorts.

- Click the **Tools&Distorts** button at the top of the screen.

Now we can increase the polygon density in the fingertips of the alien hand,

- Under the 3D workspace, click the **New** button and select **MeshMan**.
- Check **Paint Adaptive** on the MeshMan panel, and then click **OK**.

MeshMan has increased the number of polygons in the white-painted fingertips by a factor of four.

You can now create the suction cups on the fingertips:

- Select the **Brush** tool with the Default Brush shape, low negative brush **Pressure** and adjust the brush **Radius** to fit inside the fingertips.
- Sculpt into the surface (*figure 8.12*). If you need to, use the **Zoom** control to get a closer view.

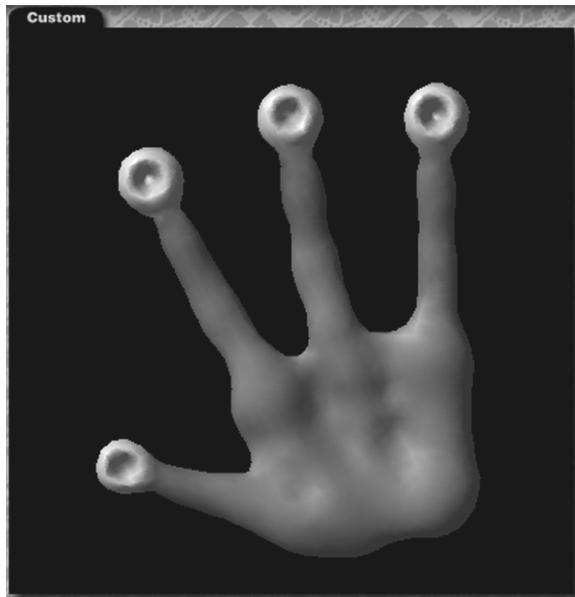


figure 8.12: Close-up of Hand with Suction Cup Fingertips.

Be sure to save the object when you're done.

8.7 Painting the Hand

We are all done with the sculpting at this point, so all that remains is that fine coat of Alien Green paint,

- Click the **Paint&Optics** button at the top of the screen.
- Use the **Color Swatch** to select a shade of bright green.
- Apply it to the entire hand by clicking the **Paint Bucket**.

The final object is shown here in all its green (black-and-white) glory (*figure 8.15*).

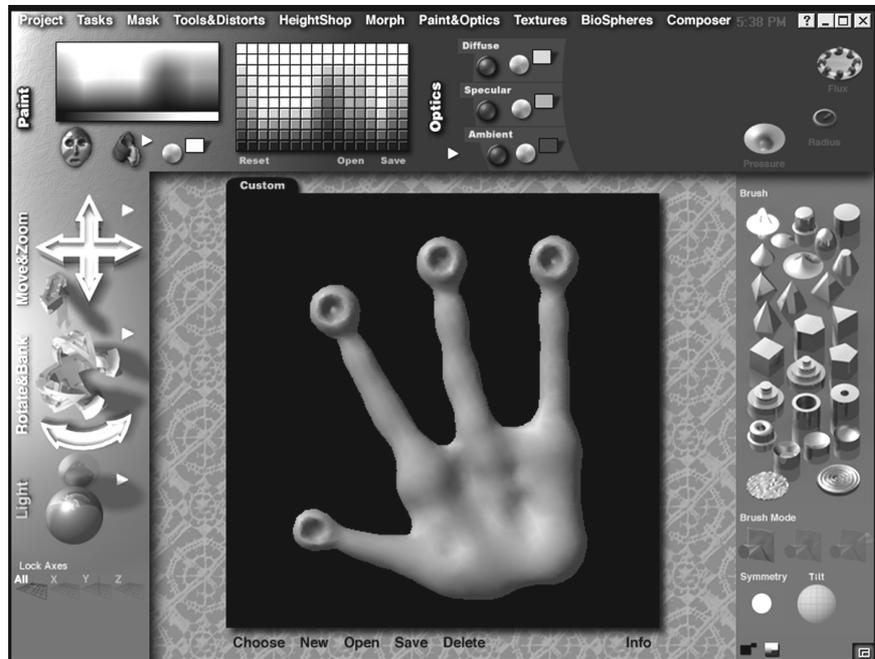


figure 8.15: The Final Hand

If you want to work with this object some more, you might try adding veins and perhaps some textures to the hand.

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Chapter 9: Sculpting a Snail

9.1 Snail Project

Introduction

When Professor Les Cargoe, our visiting entomologist, complained about the sluggish performance of his old 3D modeling package, we installed Amorphium and turned him loose. In no time, he used Tools&Distorts to create and detail a snail's shell from of a basic sphere, BioSpheres to build the snail's body, and Composer to merge the two objects together. And with Paint&Optics, his work might convince his colleagues he discovered a new breed.

9.2 Getting Started

The first thing you will need for this project is a basic Sphere. By default, Amorphium loads a sphere into the 3D workspace when you start up. If for some reason there is no sphere in the workspace, you'll need to create one first.

- Under the **3D workspace**, click on **New** and select **Sphere**.

You should see a sphere in the 3D workspace (*figure 9.1*).

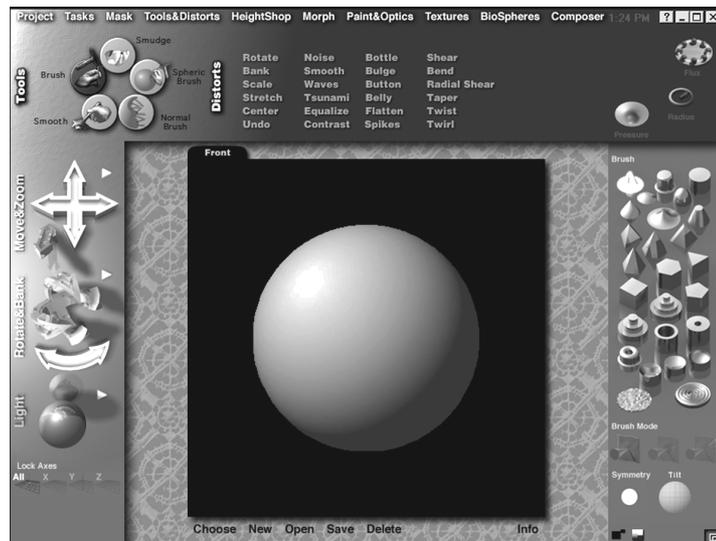


figure 9.1: Default Sphere in the 3D Workspace

- If you're not in Tools&Distorts mode, go there now by clicking the **Tools&Distorts** button at the top of the Amorphium screen.

The sphere will tag obediently along.

Save Your
Work!

After each step, it's a good idea to save the object and give it a new name. If you make a mistake or want to create a new object, you won't have to start over from the beginning.

9.3 Creating the Shell

We'll use the **Spheric Brush** tool with **Negative Pressure**, a large **Radius**, and Amorphium's default tapered brush shape (top row, far left).

- With your pointer in the center of the sphere, hold down on the left mouse button and drag the pointer down the center of the sphere.

The snail's body will be occupying this area, so really dig in (*figure 9.2*).

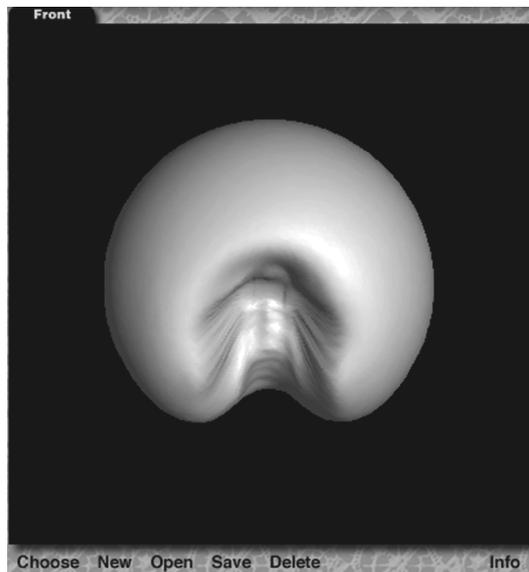


figure 9.2: Starting the Shell

- When you've made a nice home for your snail, click over the **Smooth** Distort (figure 9.3) and drag to the right a few times.

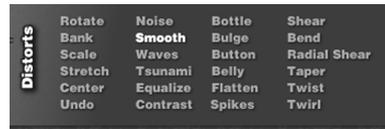


figure 9.3: The Smooth Distort

This has the effect of smoothing out the entire object (figure 9.4).

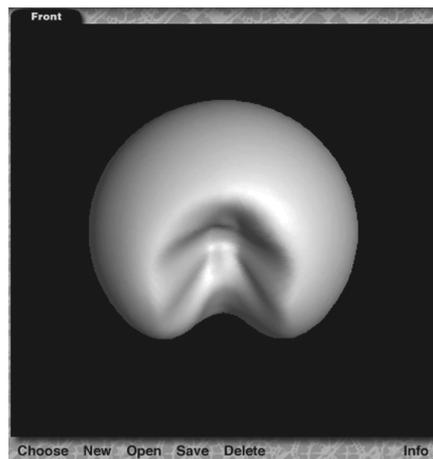


figure 9.4: Smoothing the Shell

To give the snail's shell a protective collar, adjust the brush **Pressure** to low **Positive** and increase the brush **Radius**, and begin pulling out on the edge around the opening (*figure 9.5*).

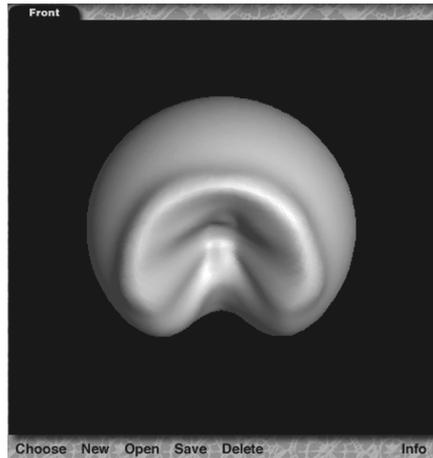


figure 9.5: Making a Collar

At this point the snail's shell is just a tad round.

- Rotate the sphere so the collar is at the top of the workspace and the underside is exposed.

To introduce you to Amorphium's **Taper** distort,

- Place your pointer over **Taper** on the Distorts menu (*figure 9.6*).

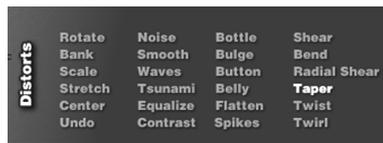


figure 9.6: The Taper Distort

- Drag the pointer to the left until you notice that the top has narrowed slightly (*figure 9.7*).

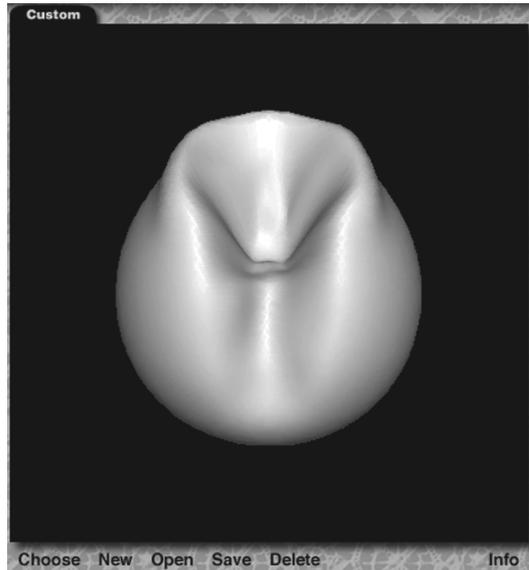


figure 9.7: Tapering the Shell

Tip When using the **Taper** distort, dragging the pointer to the left will apply the taper from the top of the object and dragging it to the right will taper the bottom.

While the shell's underside is exposed, use a large brush **Radius** and change the brush **Pressure** to a medium Negative value, then

- Hollow out the area where the snail's tail will be. When you're done, give the object a smoothing with the **Smooth** distort (*figure 9.8*).

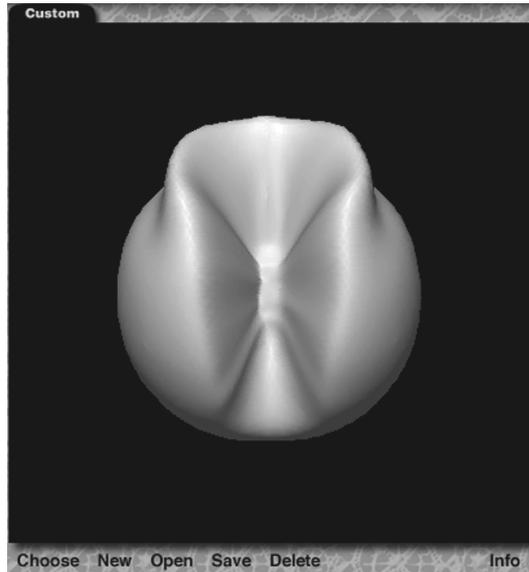


figure 9.8: Smoothing the Shell Again

- Rotate the shell so the outside is exposed and the collar is at the bottom of the workspace.
- Using a very low negative brush **Pressure**, flatten the collar.

To get rid of any rough edges, switch to the **Smooth** brush tool and go back over the area.

Don't forget to change back to the **Spheric Brush Tool** (*figure 9.9*).

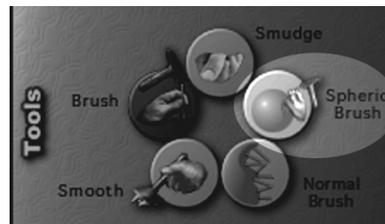


figure 9.9: The Spheric Brush Tool

At this point, look below the selection of brush tools. You'll notice three brush modes. The default, and most commonly used, is the **Front** mode. This mode will brush only the object's surface directly in front of you. At times, however, you might want to create an effect on the opposite side of the object at the same time.

The middle mode, **Both Sides**, will simultaneously pull out while you're pushing in or push in while you're pulling out, and the **Mirror** setting (at the far right), will push in or pull out the same as you do.

To create the swirling ridges on both sides of the snail's shell at the same time, click on **Mirror Brush Mode** (*figure 9.10*).



figure 9.10: Mirror Brush Mode

- From the selection of brush tools, click on Brush.
- Rotate the shell so either side is directly in front of you.

Here is a good time to save your work. You may want to practice a few times with your swirl technique and you can always begin again from this step.

To create the swirl pattern, begin at the center with a very low negative brush **Pressure** and a fairly large brush **Radius**, and carve away from the center in a spiral motion. You can vary the brush **Pressure** and brush **Radius** as you go.

There is no right or wrong way. We tried a few brush settings ourselves as we practiced our swirl (*figure 9.11*).

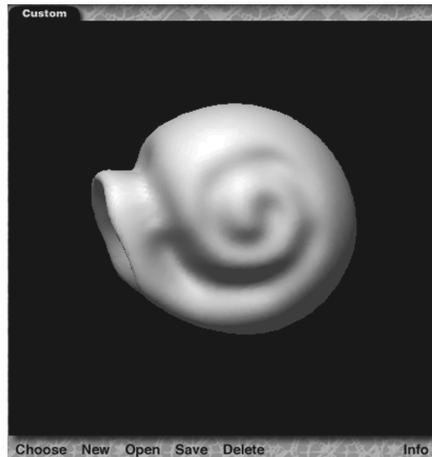


figure 9.11: Creating the Shell's Swirl

When the snail's shell looks the way you want it,

- Rotate the object until you can work on the inside of the collar.

Keep working in **Mirror Brush Mode**, but switch to the **Smooth** brush tool.

- Use medium negative brush **Pressure** and medium brush **Radius** to smooth the underside of the collar (*figure 9.12*).

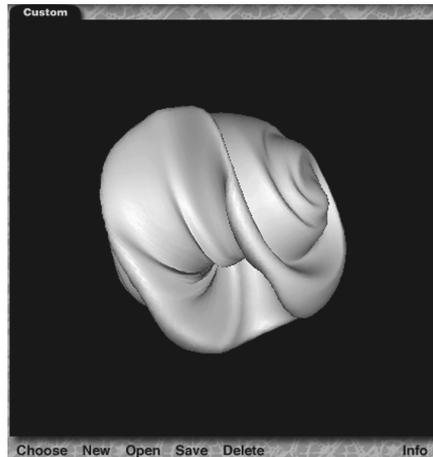


figure 9.12: Smoothing Under the Collar

Next,

- Click the **Front Bush Mode** button.
- Rotate the shell to the side position you used to create the swirls.
- Apply the **Center** Distort (*figure 9.13*) to center the object in the workspace.



figure 9.13: Center the Shell with the Center Distort

Next we'll apply the Twirl Distort (*figure 9.14*),



figure 9.14: The Twirl Distort

- Click on **Twirl** and drag the mouse to the right until you see the shell really take on a spiral. If you feel like it, do it again. We did (*figure 9.15*).

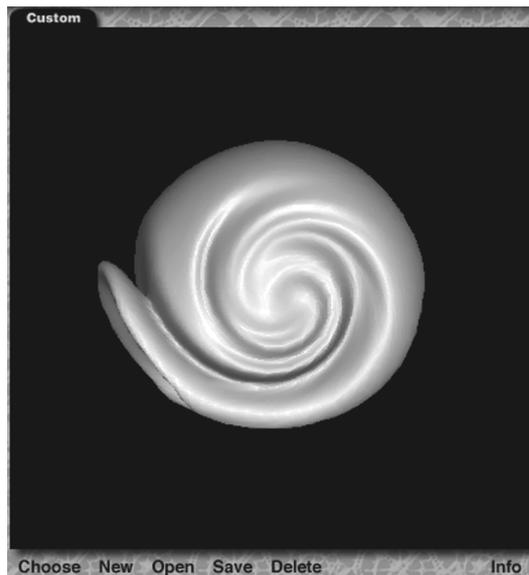


figure 9.15: Putting a Twirl on the Shell

Keep at it until you feel it's right. Remember, you don't have to duplicate our efforts, just do your own thing!

9.4 Painting the Shell

Once the shell has a decent shape, let's give it some proper color—nature abhors a default blue snail.

- Click the **Paint&Optics** button at the top of the screen.

It doesn't really matter what foundation color you choose to paint your snail shell. If you're not satisfied, remember that you can instantly undo your paint job by pressing **Ctrl-z** (that's **Apple Key-z** on the Mac). Prof. Cargoe selected a shade of yellow from the color chart. Select a color you like, then,

- Click on the **Paint Bucket** (figure 9.16).

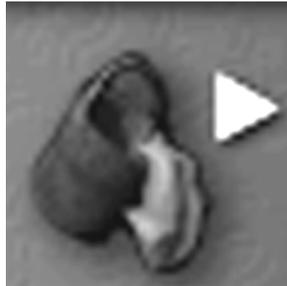


figure 9.16: The Paint Bucket

The entire shell will be painted with the color you chose.

To add a distinguishing look to the shell,

- Choose a slightly darker shade than the foundation color and click on the **white triangle** next to the **Paint Bucket** to open the Paint Effect pop-up menu (figure 9.17).

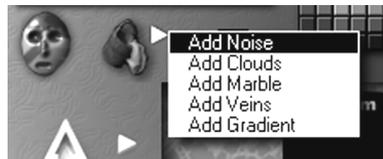


figure 9.17: The Paint Effect Pop-up Menu

- Select the **Add Noise** option.

Let's continue detailing the shell.

- Click on **Mirror Brush Mode** to paint both sides of the shell at once, and select a dark color from the color chart.
- Select a tapered brush shape, a low brush **Pressure**, and a small brush **Radius**.
- Paint highlights on the indented swirls.
- Change to back to **Front Brush Mode** and select a complimentary color to paint the inside of the collar.

Save the shell when you're happy with it (*figure 9.18*).

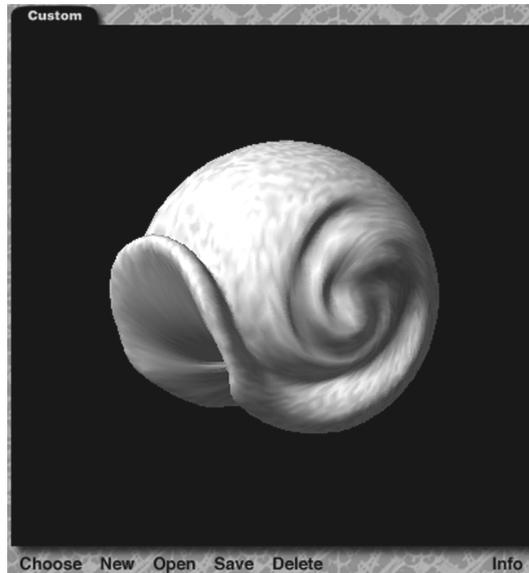


figure 9.18: The Finished Shell

9.5 Building the Body

Since an empty snail shell is a bad sign (unless you're a small crab looking for a home), we'll need a body to go with the shell. We'll build it using BioSpheres.

- Click the **BioSpheres** button at the top of the screen.

With BioSpheres, you can quickly build objects that might take much longer to create from primitive organic shapes. A snail's body is such an object.

Let's load two new BioSphere into the workspace,

- Click the **New** button found just under the BioSpheres workspace twice.

The **Selected** BioSphere displays green **Properties Handles**, and any others have just a **red dot** at their center.

- Separate the two BioSpheres by clicking on the center of the **selected BioSphere** and dragging.

Build the snail's body by adding new BioSpheres and tapering to the tail by adjusting the **Properties Handles** to reduce the **Radius and Energy** for each successive BioSphere.

Use BioSpheres with a very small amount of energy for the snail's antennae.

When you're done, check your work against Prof. Cargoe's (*figure 9.19*).



figure 9.19: The Snail Body Constructed with BioSpheres

Keep tweaking and pulling on the BioSpheres until you're satisfied with the body, then save it by clicking the Save button just below the BioSpheres workspace.

Before we can use the body, we'll have to create it as an Amorphium object.

- Click on **Generate** under the **Scene** tools (*figure 9.20*).

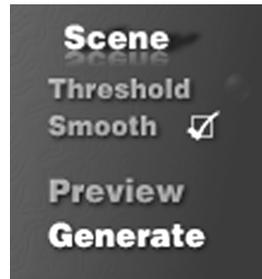


figure 9.20: The Generate Button

The body now has the look of an Amorphium object, although it may be a bit lumpy (*figure 9.21*).

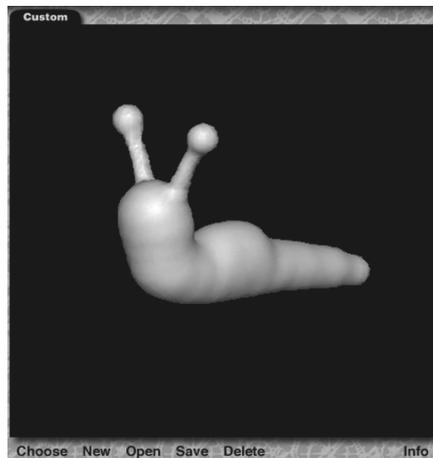


figure 9.21: The Snail's Body as an Amorphium Object

9.6 Detailing the Body

Now that we have the basic shape of the body, it's a cinch to take care of any lumps or other undesirable features.

- Click the **Tools&Distorts** button at the top of the screen.
- Select the **Smooth** Brush Tool with medium negative brush **Pressure** and a large brush **Radius**.
- Smooth the length of the snail's body, making sure to rotate the object as necessary.

To shape the snail's antennae,

- Select **Mirror** Brush Mode and smooth each antenna.

When the body is nice and smooth (*figure 9.22*), be sure to save it.

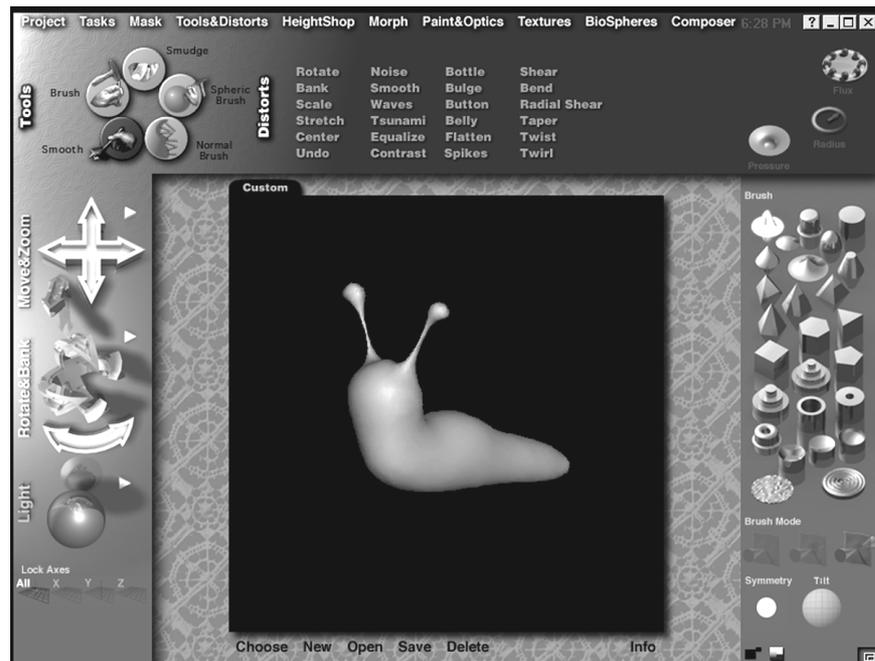


figure 9.22: The Smoothed Body

9.7 Painting the Body

Nature has about as much use for a default blue snail body as it does for a square watermelon, so let's paint it (the body, not the watermelon).

- Click the **Paint&Optics** button at top of the screen.

By now, you should be comfortable with painting an object. Try a few colors and experiment with different brush shapes. Add noise or one of the other surface modifications. With your snail body saved, you can always begin this step again.

Here's a look at Prof. Cargoe's painted body (*figure 9.23*) in glorious black-and-white for comparison.

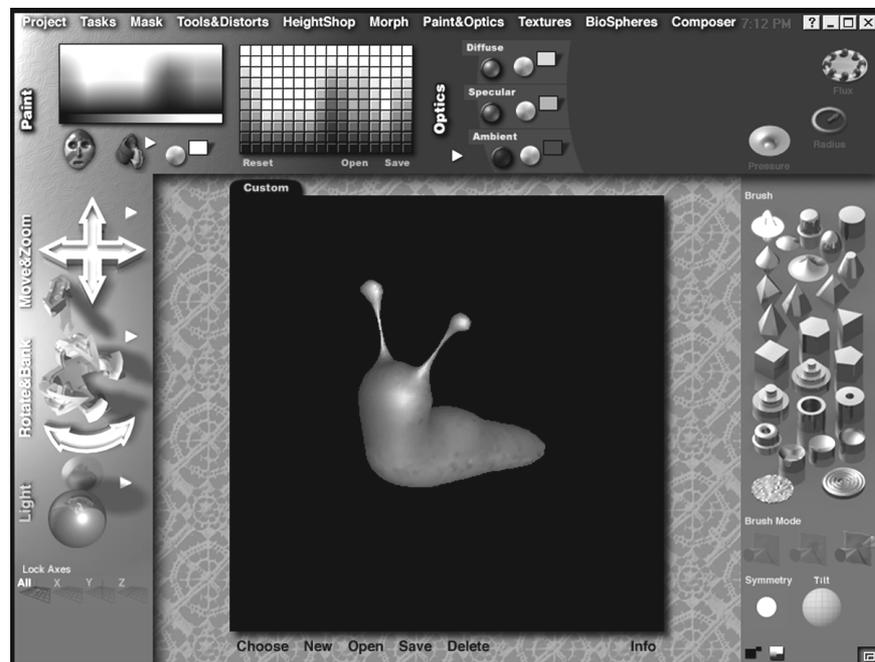


figure 9.23: The Painted Body.

9.8 Joining the Shell and Body

Now we have two objects—a body and a shell—when we only really need one. Fortunately, Amorphium allows us to join objects with no fuss or mess.

- Click the **Composer** button at the top of the screen.

Composer is where Amorphium brings together objects, backgrounds, and textures, and combines them into one static image or animated sequence that can then be used in a publication or on a website.

When you first click on **Composer**, all open objects will appear together in the Composer workspace (*figure 9.24*), but not necessarily in their final position.

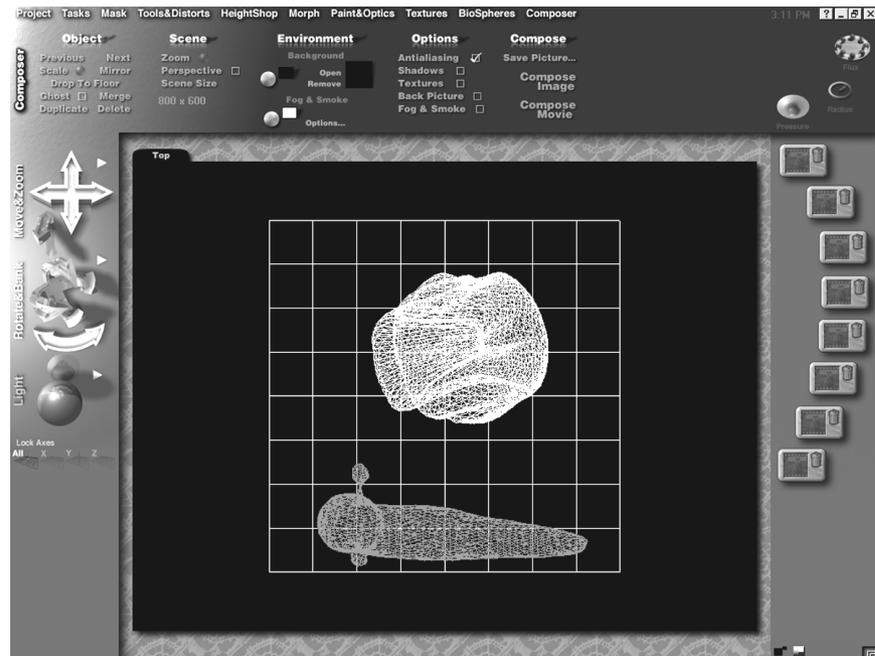


figure 9.24: The Shell and Body in the Composer Workspace

A trick to using Composer is to remember that objects are initially displayed as they are seen in **Front View** in **Tools&Distorts** mode.

- From the view tab at the top of the workspace, select **Top view**.

- From top view, align your objects over the ground plane (*figure 9.25*).

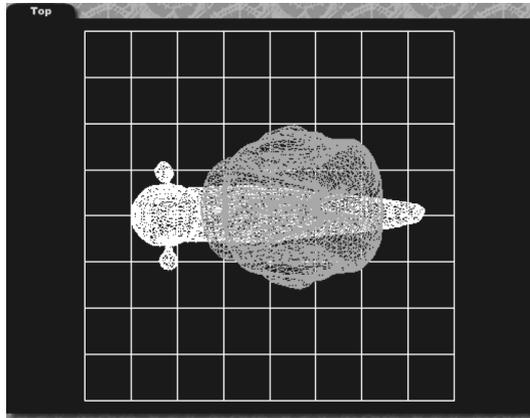


figure 9.25: Aligning the Shell and Body

Use other views to check on the alignment of the shell and body objects until they are positioned properly (*figure 9.26*).

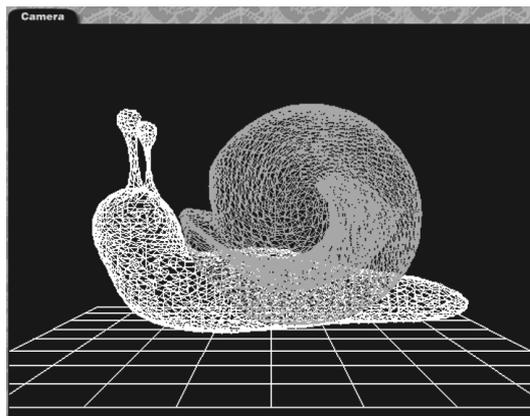


figure 9.26: The Properly Aligned Shell and Body

Now that they are properly aligned, we can have Amorphium combine them into one object.

- Click the **Merge** button under the **Object** control tools (figure 9.27).



figure 9.27: The Merge Objects Button

Composer merges objects two at a time—combining the current object with the object you click on next, so with either the shell or the body selected, click on the other object. The snail's shell will become one with its body (figure 9.28).

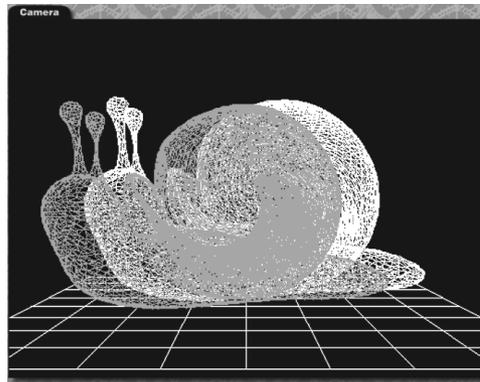


figure 9.28: The New Snail Object

After the merge, Amorphium keeps the other objects around in case you want to merge them to the new object. Just delete them if you don't want them hanging around (figure 9.29).

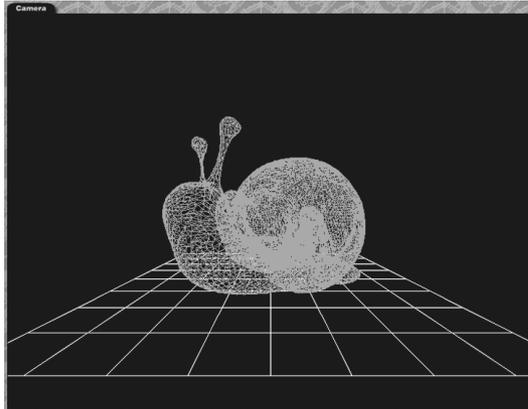


figure 9.29: Deleting the Shell and Body Objects

Prof. Cargoe wanted to share his new creation with entomologists around the world by posting a picture on his website. To do this, he clicked on **Save Picture...** under the **Compose** tools (figure 9.30).

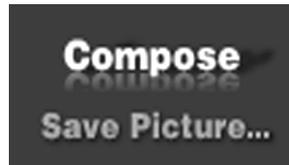


figure 9.30: The Save Picture Button

Composer went to work and rendered his creation (*figure 9.31*) so he could save it as a picture.

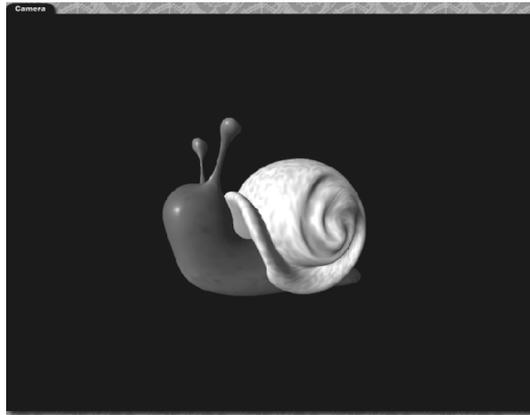


figure 9.31: The Snail Rendered as an Image

Of course you could decide to get fancy by adding a background Image (a lush leafy forest, perhaps), or adding some foggy mist to the scene—but that's up to you; for now, we're done.

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Chapter 10: Text Mapping

10.1 Text Mapping

Introduction

One of the most important uses of Amorphium is to create edgy, organic graphics elements that can be used on the Internet. Amorphium's tools give you a completely different way to create such graphics, and should enable you to create completely original Web page designs.

In this project, we'll show how you can use Paint&Optics with Composer to create an image from a 3D text object that you will then map onto another object, creating a button with raised text.

10.2 Creating the Button

Before we create our text object, we'll use Tools&Distorts to create a 3D button to map the text onto. If you're not in Tools&Distorts mode, go there now and place a sphere into the 3D workspace.

- Click the **Tools&Distorts** button at the top of the screen.
- Under the 3D workspace, click on **New** and select **Sphere**.

Begin with the object in **Front View**.

- If it isn't already, click on the tab in the upper left corner of the 3D workspace until the 3D workspace is set to **Front** view.

We want to create an oval shaped button, which is very common on Web pages, so we'll pull on the sphere using the **Stretch Distort** (*figure 10.1*).

- With the mouse pointer over the **Stretch** Distort, click and drag the pointer sideways to the right, pulling, until the sphere is stretched into an oval.

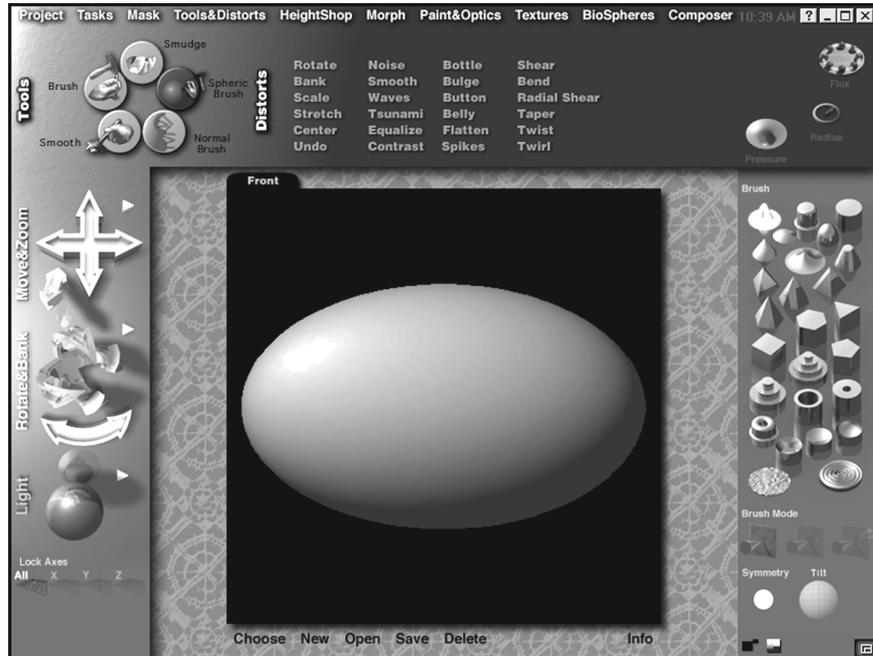


figure 10.1: Stretching the Sphere into the Oval

Rotate the 3D workspace from **Front** view to either **Left** or **Right** view.

- Click on the tab in the upper left corner of the 3D workspace until the object is in either **Left** or **Right** view.

When we pulled on the sphere to create the oval shape, we didn't make the oval any thinner, which we still need to do. Rotating it to a side view allows us to take care of that detail.

Now, in either Left or Right view, we can see the object's rounded side profile (*figure 10.2*).

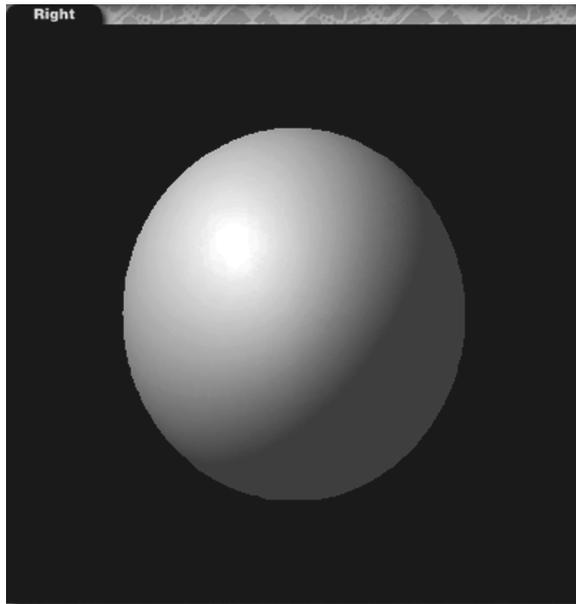


figure 10.2: side view of the object's rounded front and back sides.

We can use one of these sides to map our text, but first, we'll use the **Stretch Distort** to create a flatter surface for the text (*figure 10.3*).

- With the mouse pointer over the **Stretch** Distort, drag the pointer sideways to the left, pushing, until the front and back sides of the oval become flatter.

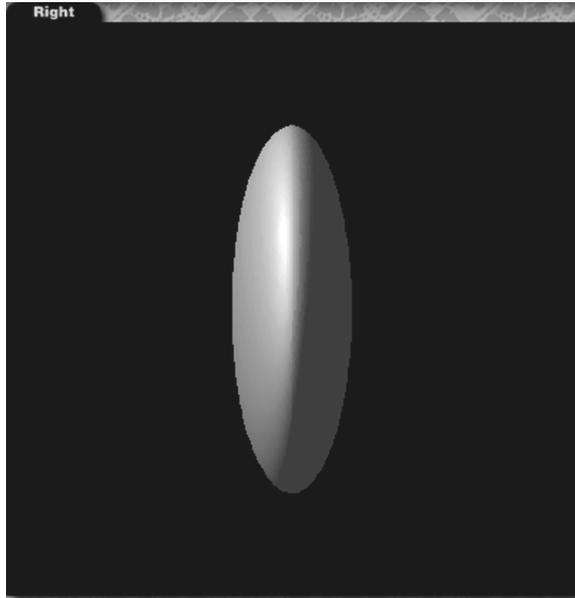


figure 10.3: Flattening the Oval

- Select the **Front** view from the tab at the top of the 3D workspace.

Save your work

After each step, save the object.

- Click the **Save** button below the 3D workspace.
- Type in a name for this object, such as **WebButton**, then press **Save**.

When an image is mapped to an object, it's possible to lose detail if there are not enough polygons comprising the object's surface. MeshMan is a feature of Amorphium that allows you to increase or decrease the number of polygons making up the surface of an object.

After we have created the oval button, we can now quickly increase its polygon count by a factor of four.

- Under the 3D workspace, click the **New** button and select **MeshMan** to open the **MeshMan panel** (figure 10.4).

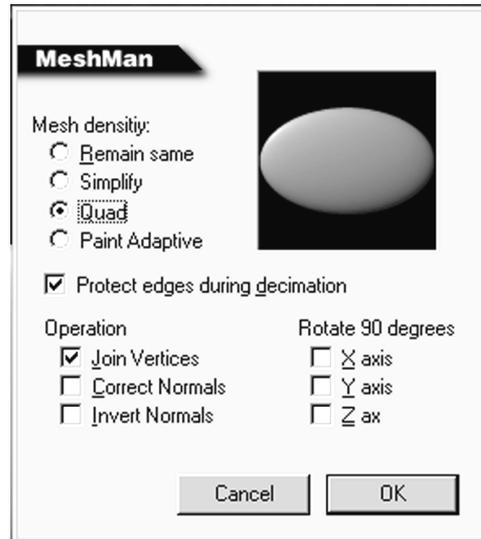


figure 10.4: The MeshMan Panel.

- Check **Quad** in the **MeshMan panel** and then click **OK**.

MeshMan created a new object with four times as many polygons. Go ahead and replace WebButton with this object.

10.3 Creating the Text in 3D

The first step in creating an image map of a 3D text object is to create the object. We can create our 3D text object using one of the fonts installed on our the computer by using **FontMan**, Amorphium's 3D text creation tool.

From Tools&Distorts mode,

- Under the 3D workspace, click on **New** and select **FontMan**.

When the **FontMan** panel appears (figure 10.5),

- Choose a font, like **Arial** or **Helvetica**, and type **Play**, or any short word.
- Increase **Segmenting** from 4 to 16.

- Increase **Depth Divisions** from 4 to 16.

Segmenting and Depth Divisions increase the number of polygons underlying the surface of the text object like **MeshMan** did on the button object. This makes for smoother bending and distortion of the text.

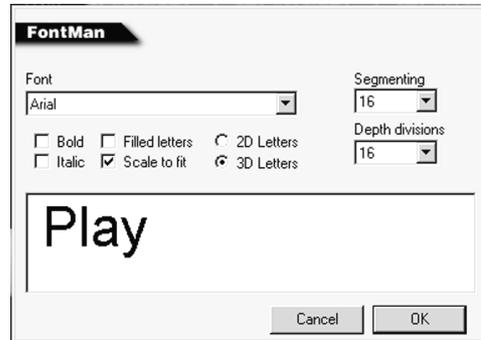


figure 10.5: FontMan with "Play" Text

- Click on **OK** and the 3D text object will be created in the 3D workspace (*figure 10.6*).

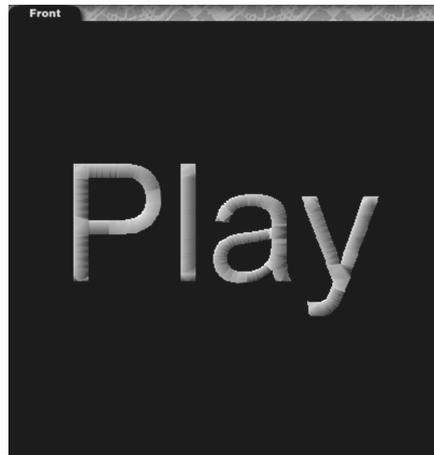


figure 10.6: Play Text in the 3D Workspace

It's a good idea to save the text at this time.

- Click the **Save** button below the 3D workspace.
- Type in a name for this object, such as **PlayText**, then press **Save**.

10.4 Painting the Text

Image maps used in HeightShop to either emboss or engrave an object adhere to a color scheme based on a grayscale that determines whether a map pulls out or pushes in on the object's surface. White images pull out and black images push in. Gray has no effect.

- Click the **Paint&Optics** button at the top of the Amorphium screen.

The text object, **Play**, will appear in the 3D workspace in default Amorphium blue. We'll paint this object white (*figure 10.7*) because we want to pull text out from the button's surface.

- Drag the eyedropper over the color white on the Palette and release the mouse button.
- Click on the **Paint Bucket**.



figure 10.7: Play text object painted white in the Paint&Optics workspace.

We can also increase the brightness of the text object by adjusting the **Ambient** light on the object.

- Move the pointer over the **Ambient** tool, then click and drag sideways to the left until the text is as white as it can get (*figure 10.8*).

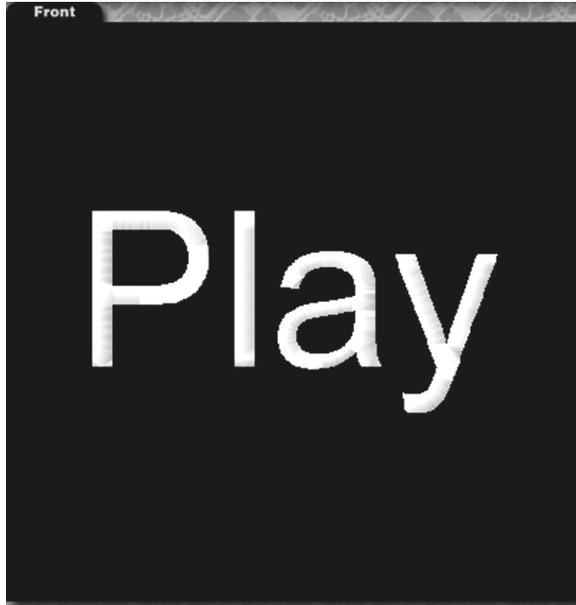


figure 10.8: Play in White in the 3D Workspace.

10.5 Creating the Image Map

One of the features of Amorphium's Composer is to create an image map that HeightShop can use to map on the surface of an object.

- Click the **Composer** button at the top of the Amorphium screen.

The text appears in Composer's workspace as a red mesh object (*figure 10.9*). If other objects appear in the Composer window, click on them and move

them off-screen or delete them until the Play text is the only object in the Composer workspace.



figure 10.9: Composer screen with red mesh Play text in workspace.

To compose an image map for HeightShop,

- Click on **Compose Image** from the list of Compose options.

Composer will convert the white text object to an image (*figure 10.10*).

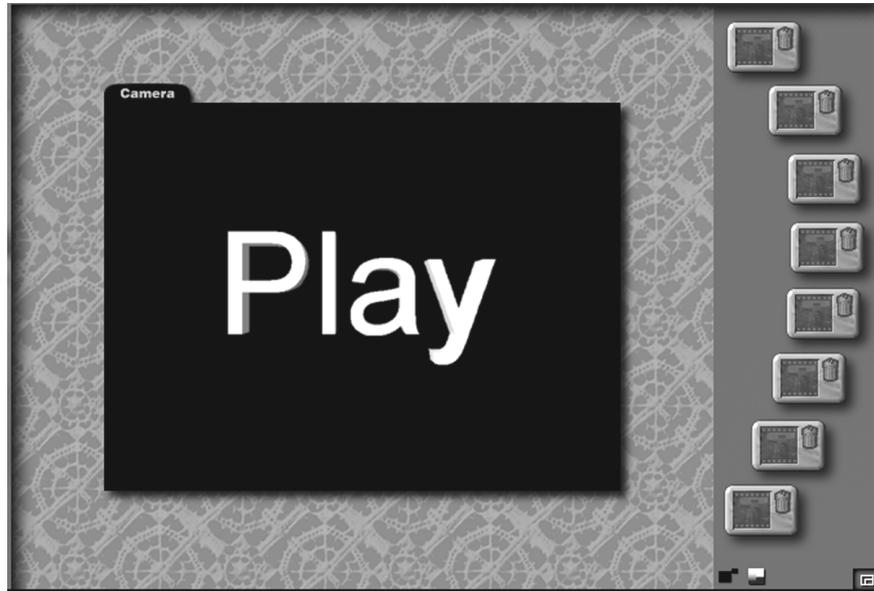


figure 10.10: Play Text as an Image in the Composer Workspace.

Save this image for HeightShop,

- Click the **Save Picture...** button and choose a format such as **GIF**, then type in a name for the image, such as **PlayImage**.

10.6 Mapping the Text to the Button

With HeightShop, we can take the 2D image of the 3D text and map it to the oval button—a 3D object—raising the object's surface in the shape of the text.

- Click the **HeightShop** button at the top of the Amorphium screen.

The oval button we created or the last object created will appear in the HeightShop workspace (figure 10.11).

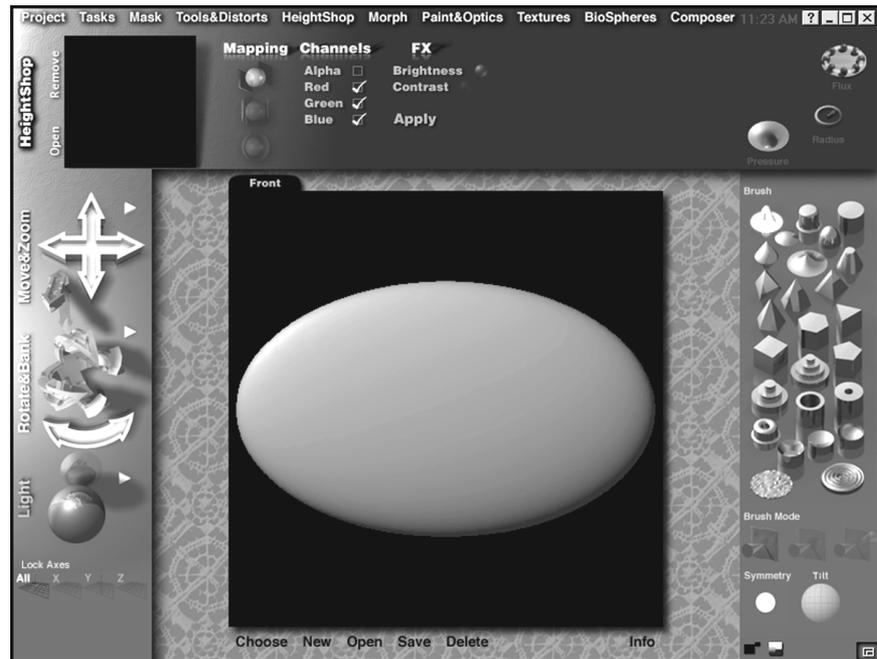


figure 10.11: HeightShop screen with oval button in workspace.

To emboss the oval button with the image of the text,

- Click the **Open** button, next to the **Current Height Shop Image**, and select the **PlayImage** file you just saved.

The image, will appear as the **Current Height Shop Image** (figure 10.12).



figure 10.12: HeightShop Controls with Play Text as Current HeightShop Image

When we created the oval button, we gave it a flatter surface so the text would not distort it when we apply the map.

HeightShop can apply an image to the surface of an object with either **Planar**, **Cylindrical**, or **Spherical** mapping.

In this case, we'll use **Planar Mapping** to apply the image to the button.

- Click on the **Planar Mapping** button under HeightShop's Mapping controls (figure 10.13).



figure 10.13: Planar Mapping Highlighted.

To map the image to the surface of the oval button,

- Move the pointer over the **Apply** button, then drag the pointer sideways, to the right, until the text is raised on the button's surface (figure 10.14).



figure 10.14: The Button with the HeightShop Map Applied



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Chapter 11: Text Animation

11.1 Text Animation

Introduction

3D text can be a very useful element in many different kinds of art—from 2D illustrations to presentations to 3D animations.

Amorphium has a complete set of 3D text creation and manipulation tools, and that's what you will be using in this project. The end result will be an animation of the text in the animated GIF format.

11.2 Creating a 3D Text Object

If you're not in **Tools&Distorts** mode, go there now.

- Click the **Tools&Distorts** button at the top of the Amorphium screen.

When we work in Composer to produce our animation, all open objects will be brought into the Composer workspace including the text object we're about to create. Since we don't need any other objects for this project, now would be a good time to delete any objects you don't want to keep, or save those that you do.

With that taken care of, it's time to create our text. We'll turn to FontMan for this.

- Click the **New** button below the 3D workspace and select **FontMan**

When the FontMan dialog box appears (*figure 11.1*),

- Choose a font, like **Arial** or **Helvetica**, and type **Amorphium**.

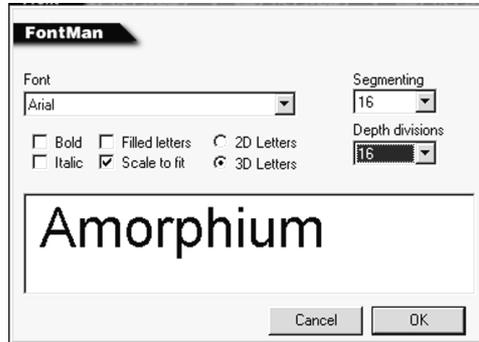


figure 11.1: The FontMan Panel with the Amorphium Text

- Increase **Segmenting** from 4 to 16.
- Increase **Depth Divisions** from 4 to 16.

We will increase the default values of **Segmenting** and **Depth Divisions** which will increase the number of polygons in the text. This is not always necessary, but for this project it's important since we will be twisting and bending the text.

- Click on **OK** and your 3D text object will be created in the 3D workspace
- We'll save the text object because saving our work is a good habit to get into, and when we choose it again, it won't have the name **Untitled**.
- Click the **Save** button below the 3D workspace.
 - Type in a name in the **Save File** window, such as **AmorphiumText**, then press **Save**.

11.3 Setting the First Keyframe

Composer mode is used to animate the characteristics of one 3D object at a time using up to eight keyframes. From the Tools&Distorts mode,

- Click the **Composer** button at the top of the Amorphium screen.

This takes you into Composer mode where you can now see the text object in the Composer workspace (*figure 11.2*).

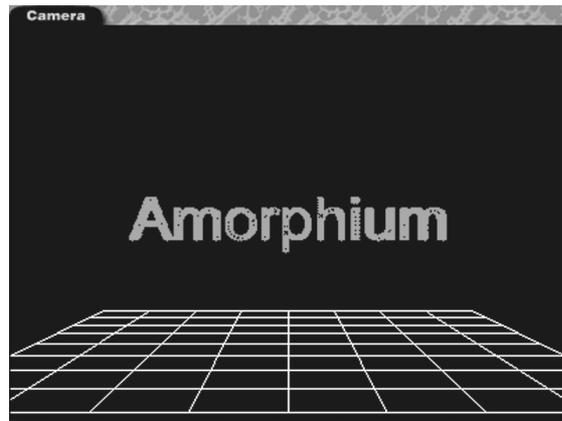


figure 11.2: Composer Workspace with AmorphiumText

The object appears white in the Composer workspace until you select it. The object must be selected before you can re-size it or create a keyframe for it.

- Click on the **Amorphium** text object in the Composer workspace, or click the **Previous/Next** Object buttons.

The text should now appear red, if it didn't before, indicated that it is the selected object.

There are eight keyframes displayed to the right of the Composer workspace. To create the first frame of animated text,

- Click on the **first keyframe** (at the top).

Composer has created a keyframe for the text object, and a result, it now appears yellow (figure 11.3).

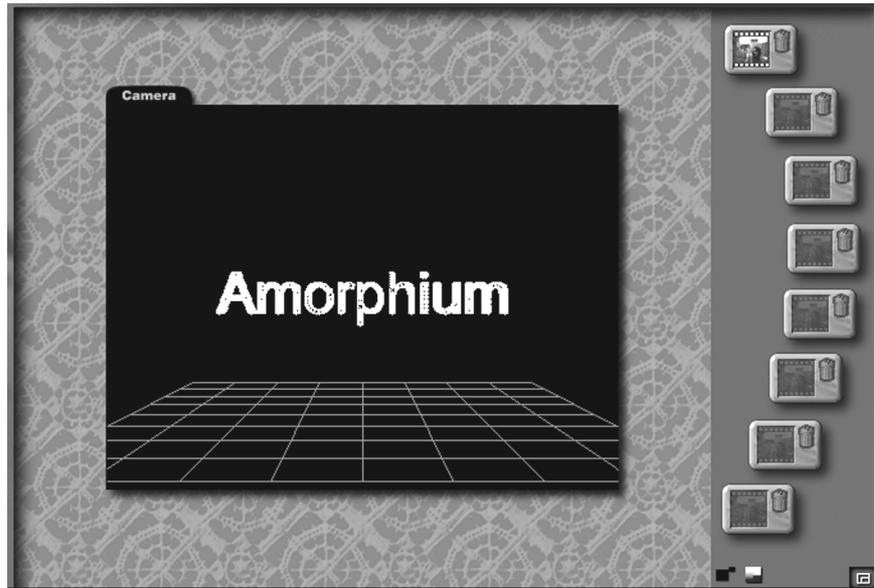


figure 11.3: Composer Workspace with First Keyframe Set

By setting the first keyframe, we have determined exactly where the text will be at the beginning of the animation. Unless we do something else with the text, before we create another keyframe, however, the text will display a high degree of inertia, which is exactly the wrong thing for an animation.

11.4 Distorting the Text Object

We'll provide the motion for this animation by working on the text for a bit, and then we'll get back to setting keyframes.

- Click the **Tools&Distorts** button at the top of the Amorphium screen.

The text object should be selected currently, but if it isn't,

- Under the 3D workspace, click on **Choose** and select the **AmorphiumText**.

We're ready to create some motion for the text and to do that, we'll use a couple of the Distorts—**Twist** and **Twirl**.

Before we apply those Distorts, we'll reorient the object in the Workspace.

- Click the **Bank** tool, and orient the object diagonally in the workspace (*figure 11.4*).

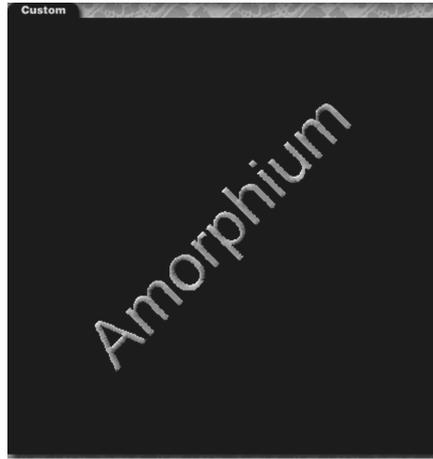


figure 11.4: The Banked Amorphium Text

The distorts **Twist** and **Twirl** are applied along the x-axis and banking the object before we apply them will create a more interesting effect.

- Move the pointer over the **Twist** Distort, click and drag the mouse sideways in either direction to twirl the text object (*figure 11.5*).

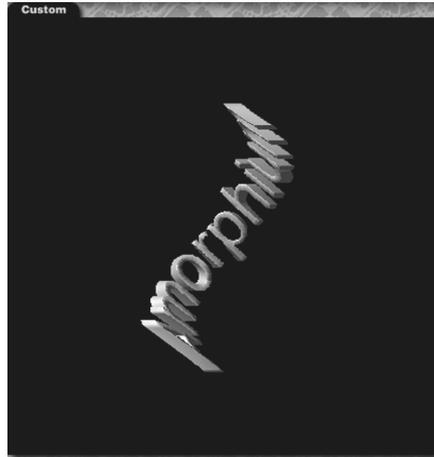


figure 11.5: Amorphium with 100% Twist

- Move the pointer over the **Twirl** Distort, click and drag the mouse sideways in either direction to twirl the text object (*figure 11.6*).



figure 11.6: Amorphium with 100% Twist and 100% Twirl

Now, before returning to Composer,

- Click the **Bank** tool and return the **Amorphium** text back to its original horizontal position in the 3D workplace (*figure 11.7*).

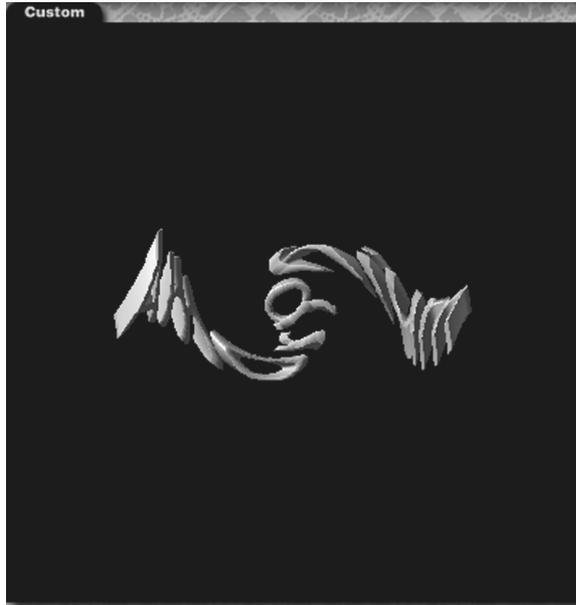


figure 11.7: Distorted Text Back in the Horizontal

11.5 Setting the Second Keyframe

Now that we have done some twisted things to our text, it's time to get back to setting keyframes, or in the case of this project, keyframe—we only need one more to finish.

- Click the **Composer** button at the top of the Amorphium screen.

The Amorphium text should appear in the Composer workspace (figure 11.8).



figure 11.8: Composer Workspace with Distorted Text and Second Keyframe Set

To create the second and last frame of animated text,

- Click on the **second keyframe**.

What will happen now is that when we create the animation, Amorphium will figure out how to turn the normal text into the twisted text—calculating exactly how to move everything while you sit back and watch.

11.6 Making the Animation

To animate the two keyframes of AmorphiumText,

- Click the **Compose Movie** button.

This will open the **Make Movie** panel (*figure 11.9*)

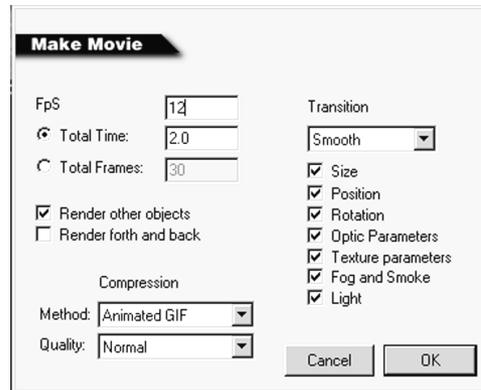


figure 11.9: Make Movie Panel

We'll create this animation as a 2 second animated GIF file (the most common animation format on the Internet) with a total running time of 24 frames.

- Enter **12** in the **FPS** box.
- Click **OK**.

You will now see a **Save File** window in which you can enter a name and location on the computer hard drive for the file

- Type in **Amorphium.gif** and click **OK**

Amorphium will begin rendering the animation a frame at a time. You will see a progress indicator while Amorphium renders. When it has finished the animation, a playback window will appear, and the animation will begin playing.

To stop the animation.

- Click the mouse button anywhere on the screen.

You should try a few more animations—try setting three keyframes, try other objects. Be creative!

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Chapter 12: Cola Can Project

12.1 Starting Out

Our first step is to model a soft drink can, which is basically cylindrical in shape.

- Click **New** below the 3D workspace and select **Standard Shape**.

This opens the **Standard Shapes** panel, which gives us more control over the cylinder than simply choosing Cylinder from the menu.

- Select **Cylinder**, and change the following values: **X=64**, **Y=64** and **Base Divisions=64**.
- Click **OK** when you are finished.

The Standard Shapes panel will go away, and our cylinder will appear in the 3D workspace (*figure 12.1*).



figure 12.1: The Soda Can (the early years)

The initial shape of the cylinder (*figure 12.1*) is entirely unspectacular, and besides that, more squat than a soda can, but we have to start somewhere.

Therefore, let us proceed to stretch it into a more agreeable shape.

- At the top of the screen click **Tools&Distorts**, if it is not already selected to display Amorphium's Tools and Distorts.
- Click **Stretch**, and without releasing the mouse button, drag in the horizontal and vertical direction until the overall shape resembles a can (*figure 12.2*).

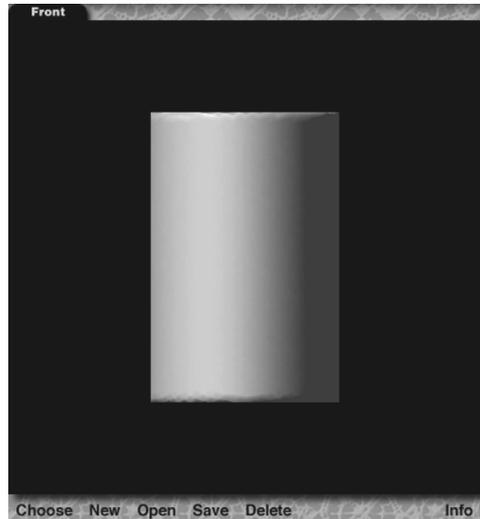


figure 12.2: The Can Takes Shape

Since Stretch distorts the object in all dimensions, we had better check another angle to make sure the can is round.

- Go to the **Top View**.

Ah-ha. Just as we suspected. When viewed from the top, the can is oval in shape, unlike any cola can we've ever seen. Now that we're looking at it from the top, it's simple to get the shape back to circular.

- Use **Stretch** as above to return the can to circular shape.

At this point, our object is still only vaguely can-like. We can certainly do much better, so, we will.

12.2 Get the Shape Just Right

Next we'll apply a sneaky technique to help model the edge of the can easily. It's called **Height Mapping**. Height Mapping applies distortion to an object

based on the brightness of an image you can select. The tools for height mapping are found in the Height Shop menu.

- Click **HeightShop** to bring up the tools that will get the job done (figure 12.3).



figure 12.3: The Height Shop Tools

Height mapping can be applied to an object with either Spherically, Cylindrically, or Flat Mapping. These three height mapping methods are selectable from three icons, from top to bottom, Flat, Cylindrical, and Spherical.

- Select **Cylindrical Height Mapping** by clicking the middle icon (figure 12.4).



figure 12.4: The Cylindrical Height Mapping Control

For the cylindrical height map, a gradient image has already been prepared for you. This image is called ColaBW.

- Click **Open**, just to the left of the Image Preview.

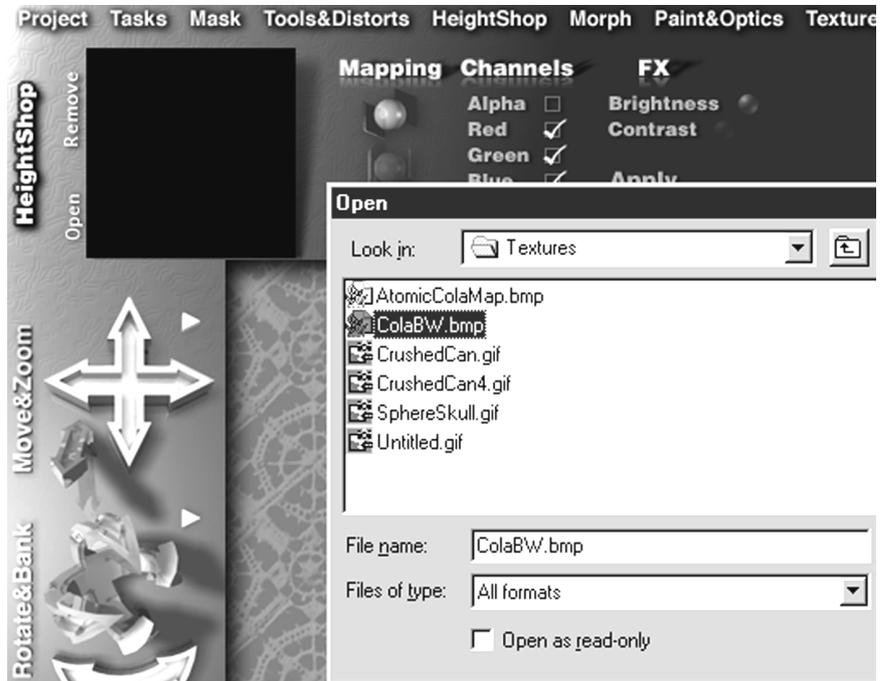


figure 12.5: Opening an Image for Use as a Height Map

A requester will appear (*figure 12.5*) which will allow you to select an image for the height map.

- Navigate to the Amorphium **Textures** directory, and select the **ColaBW.bmp** image.

This gradient image becomes visible as the **Current HeightShop Image** (figure 12.6).

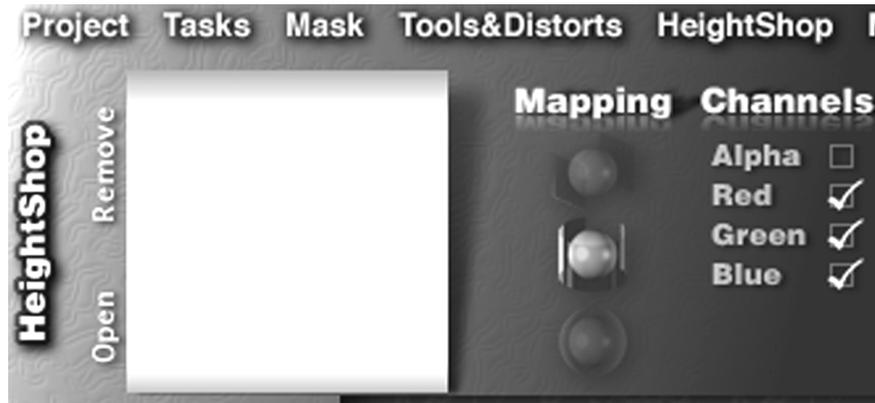


figure 12.6: The ColaBW Image as the Current HeightMap Image

Notice that this image is whiter in the middle, but gradually changes to a darker gray at the top and bottom. Also notice the tiny band of lighter gray at the extreme edges of the image.

- Click and hold **Apply**, and drag the mouse to the right.

Amorphium lets you vary the amount of the height map (and most other effects) interactively. As you drag the mouse, the can will either expand or contract.

- Continue applying the height map until the value reaches **+100%**.

Our former cylinder should be taking on a decidedly can-like appearance (*figure 12.7*).



figure 12.7: Can with Height Map Applied

Height Mapping in Action

The Amorphium logo with the hands on the sphere was created with height mapping. A black and white gradient image of hands was applied to a sphere using the spherical height mapping method.

Remember in the beginning of this project, you had two different basic models from which to mold- a basic cylindrical shape and an organic cylindrical shape. If you chose the organic cylinder model, it might look a little too "jaggy" at the top and bottom. This is because the organic model currently uses just a few polygons. Fewer polygons make for a rougher model, and more polygons make for a smoother one.

Fortunately, the number of polygons can easily be changed by using another of Amorphium's features: MeshMan.

Start with your cylindrical organic shape after it's been suitably sized, etc.

- Click the **New** button under the 3D workspace, and select **MeshMan** to open the MeshMan panel (*figure 12.8*).

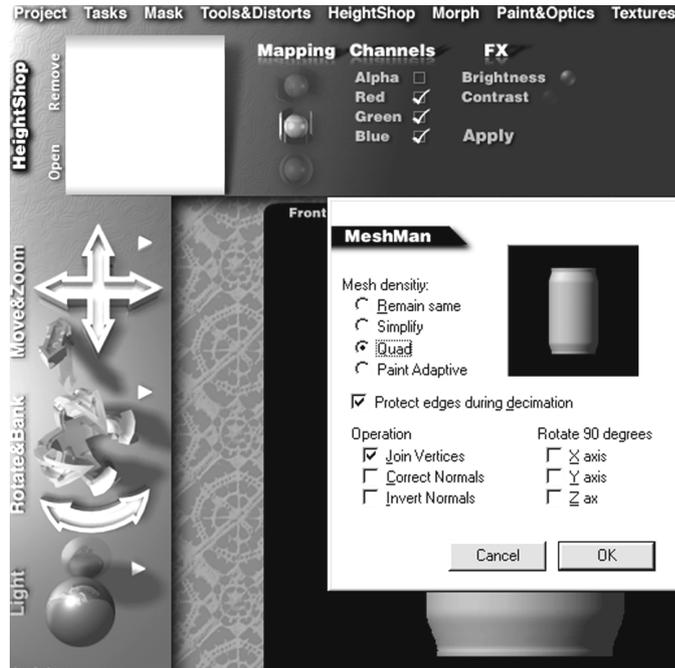


figure 12.8: The MeshMan Panel with Can Preview

Notice the preview of the can which appears in the panel. It's our job to give this can more polygons, and we will use Mesh Density to do it.

- Under the **Mesh Density** setting , select the **Quad** option to create more polygons.

When MeshMan is finished with the can, it will have four times as many polygons as before.

Next, you might want to create the slight indentation for the top and bottom of the can (*figure 12.9*). This is done by choosing the right circular shaped

brush, selecting the right size brush, and applying the brush with negative pressure to create the indentation.

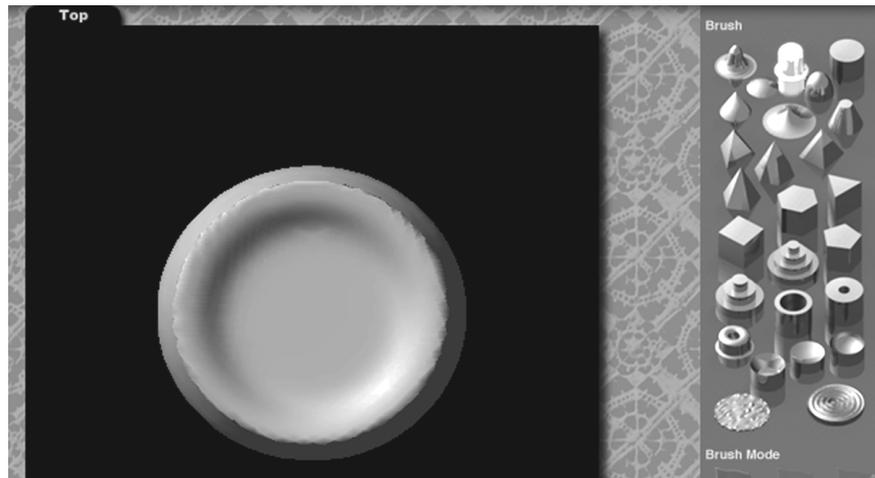


figure 12.9: Top and Bottom Indentation

It may take several tries before you get just the right shape with the indentation just inside the lip of the can.

Note Because the cylinder is symmetrical about the top and bottom, you can also select **Mirror Brush Mode** to create the top and bottom at the same time.

12.3 Introducing Atomic Cola

The next step is to add a cool surface texture, or texture map as its often called in 3D circles, to our modeled can.

- Click the **Textures** button at the top of the Amorphium screen.

This opens up the Textures tools (figure 12.10).



figure 12.10: Textures Panel

- Click the **Open** button next to the **Current Texture**.

This brings up an **Open File** window which will allow you to open a texture. A cool texture map image has been created for you called **AtomicCola Map.bmp**.

- Select **AtomicCola Map.bmp** image then click **Open** to apply it to the can's surface (figure 12.11). Be sure to select the **Cylindrical Mapping** option as well.

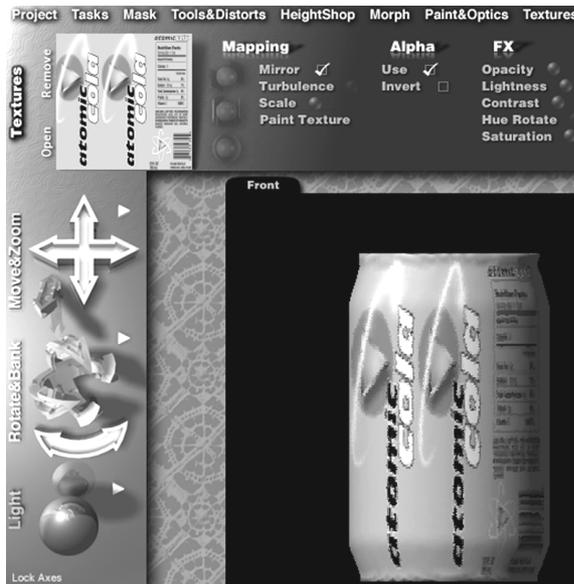


figure 12.11: Atomic Cola Texture Mapped to the Can

Once the AtomicCola image is applied to the surface with a Cylindrical map, rotate the can. Zoom in and check out the ingredients of Atomic Cola. That's quite a powerful beverage! You can also load in your own texture image. All of the popular image file formats are supported (jpeg, bmp, gif, tiff, and Macintosh pict).

Now's a good time to name your modeled can.

- From menu below the 3D workspace, click **Info** and the **Object Info** panel appears.
- Name the textured can **NormalCan** (figure 12.12).

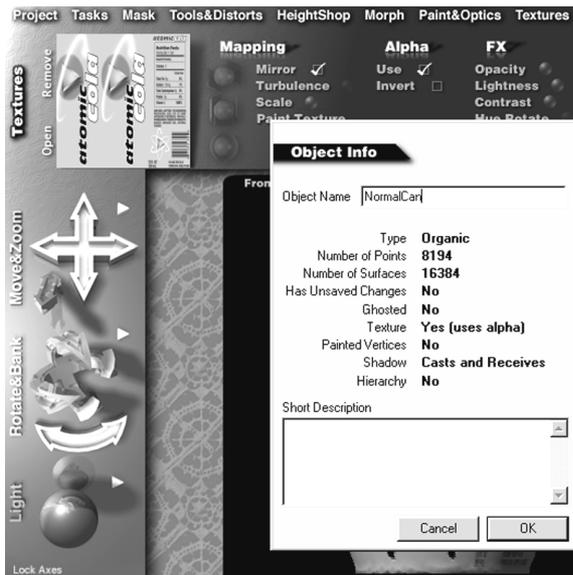


figure 12.12: Info Panel—Renaming the Can.

12.4 Recycle the Can

Now that we have the Atomic Cola can modeled and textured, let's animate it to show the can being crushed.

- At the top of the screen click **Tools&Distorts**.
- Click **New**, then click on the **NormalCan** icon in the pop-up menu. This makes a copy of the Atomic Cola can to perform distortions on.

We'll create a crushed can animation using a combination of techniques from Amorphium- distortion, morphing and keyframing. Let's start the whole animation process by applying some very interesting distortions to the can to create a dramatic crushed look.

- Select the **Brush** Tool, and from the Brush palette pick the **pyramid** shaped brush.
- Select a **50% Radius**, negative **Pressure** (for pushing the can inward), and **100% Flux**. Selectively apply the brush to achieve a punched in effect.
- To squeeze the sides of the can in, select **Spherical Brush**, a larger **Radius**, and use the first brush tool. Apply the brush from the outside inward.

Use Amorphium's other distortion tools such as **Twist** and **Stretch** to make the can look even more crushed.

- Use the **Smooth** brush tool to go over the edges of the crushed distortions to make them look more realistic.

The end result of this distorting, twisting, and smoothing will be the final shape of our crushed can (*figure 12.13*).

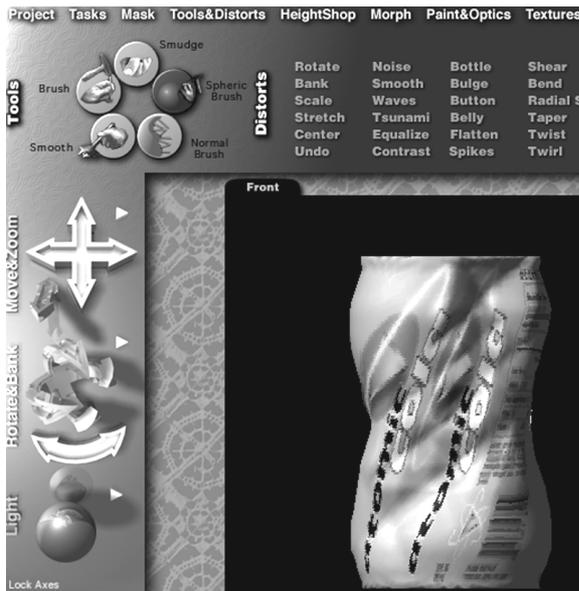


figure 12.13: A Well-Crushed Can

- Click **Info** from the lower menu, and name your distorted object "Crushed-Can".
- At the top of the screen click **Composer**.

You'll notice the crushed can highlighted in bright red. But you'll also see the normal can overlaid on top of it, as well as any other objects you may have been working with.

- Click on the **NormalCan** object, then Click **Ghost** (the normal can object becomes dark red).

Ghosting permits any object to be used for morphing, but prevents it from showing up in the final rendering. You can even move the ghosted can off the display so it doesn't get in your way. As long as it's ghosted, it won't affect the final animation. Ghost any other objects you may need to. All you should be left with is the CrushedCan object displayed in bright red.

- Click on **Morph** at the top of the screen, to display the **Morph** tools (figure 12.14).



figure 12.14: The Morph Tools

Notice there are two smaller windows with a triangular Morph Optics control between them. You can actually morph along four different paths, as indicated by the morphing direction arrows. We'll use the most common method, which is the upper morph path shown in the Morph Optics control.

- From the **Left Morph Window** click **Chose** and select **NormalCan**.

It will appear in the Left Morph Window without any texture, which is normal.

- From the **Right Morph Window**, click **Chose** and select **CrushedCan**.

It will be displayed in the Right Morph Window, also without any texture. (figure 12.15).

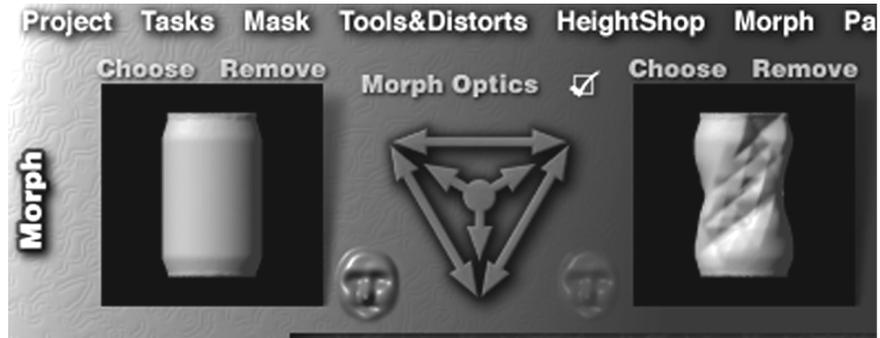


figure 12.15: Morph Windows with Normal and Crushed Can

- Move the pointer over the horizontal Morph Target arrow between the Morph Windows, then click and drag the mouse either to the left or right.

Dragging toward the right morphs from the normal can to the crushed can. Dragging toward the left morphs from the crushed can to the normal can. If your morph looks strange, that might be because you rotated the can. Morphing is best achieved if both objects remain relatively stationary.

We'll continue creating our crushed can animation with the combined efforts of the Morph and Composer panels. We'll be using the NormalCan and CrushedCan objects and creating keyframes in the Composer window. Then we'll render the animation by selecting Create Movie.

- Again using the horizontal Morph Target arrow, drag the mouse all the way left towards the **NormalCan** object.
- Select **Composer** from the top of the screen.

This brings up the Composer workspace where the animation will be performed (figure 12.16).

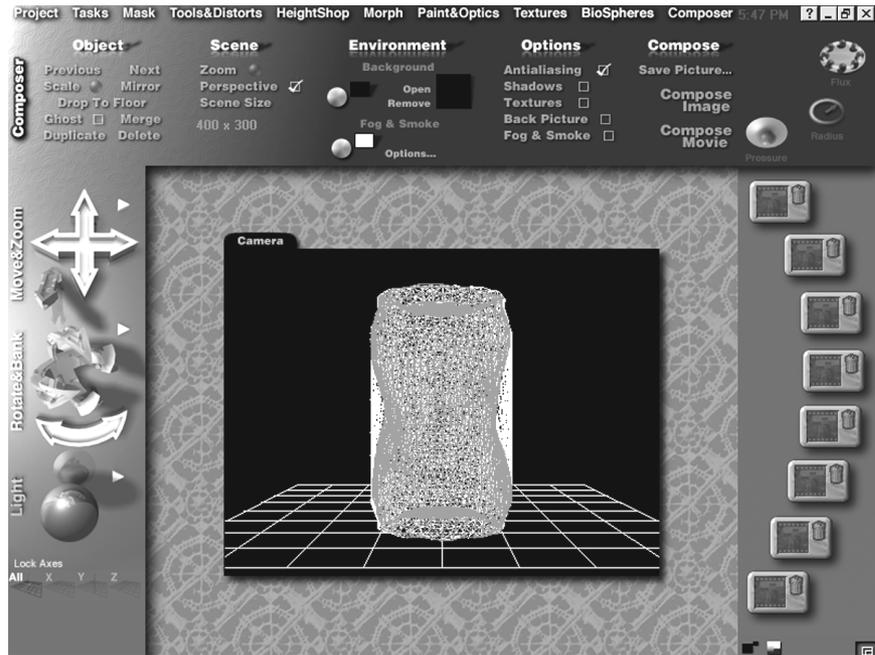


figure 12.16: Composer panel.

You'll see the CrushedCan, morphed to look like the original NormalCan, and outlined in bright red.

Click on the first keyframe symbol, which highlights it in white (*figure 12.17*).

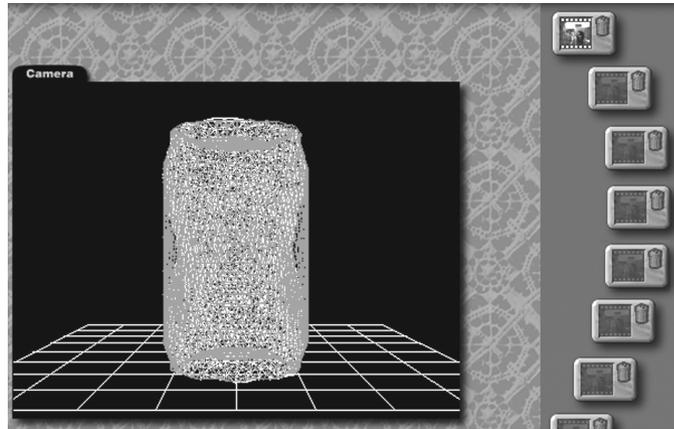


figure 12.17: Can Animation- First Keyframe.

- Click the **Morph** menu, click on the horizontal Morph Target control, and drag the mouse all the way right towards the **CrushedCan**.
- Select **Composer** menu, and notice that the crushed can object is displayed in bright red.

This will be our second key frame (*figure 12.18*).

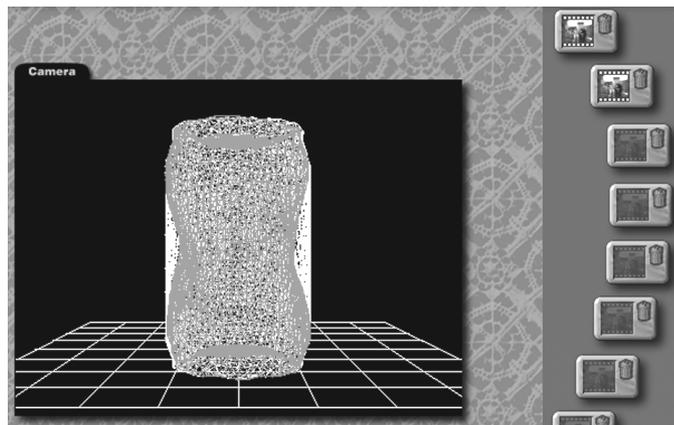


figure 12.18: Can Animation-Second Keyframe.

- Click the second keyframe (it highlights in white).

Select the Morph menu, and morph the crushed can all the way back to the normal condition.

- Select the Composer menu and click the third keyframe, etc.

You should begin to see a pattern here. Create as many keyframes as necessary for your animation to cycle back and forth between normal and crushed states.

12.5 Make a Movie

- From **Composer**, click **Compose Movie**, which brings up the **Make Movie Panel** (figure 12.19).

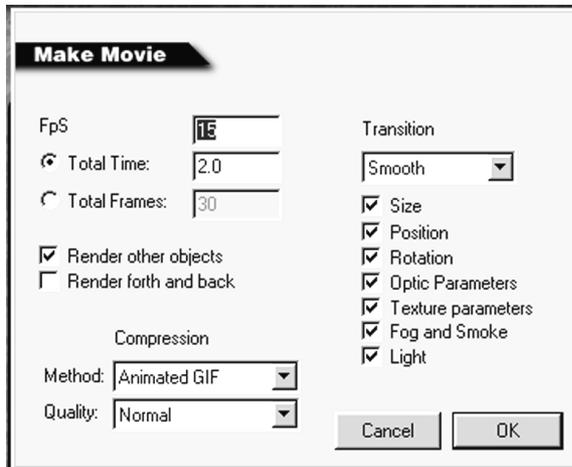


figure 12.19: Compose Movie panel

In this window, you'll choose such settings as FpS (frames per second display rate); Compression Method (a wide variety of CODECs are supported- including Quicktime, GIF animation, and the new Sorenson); and Quality.

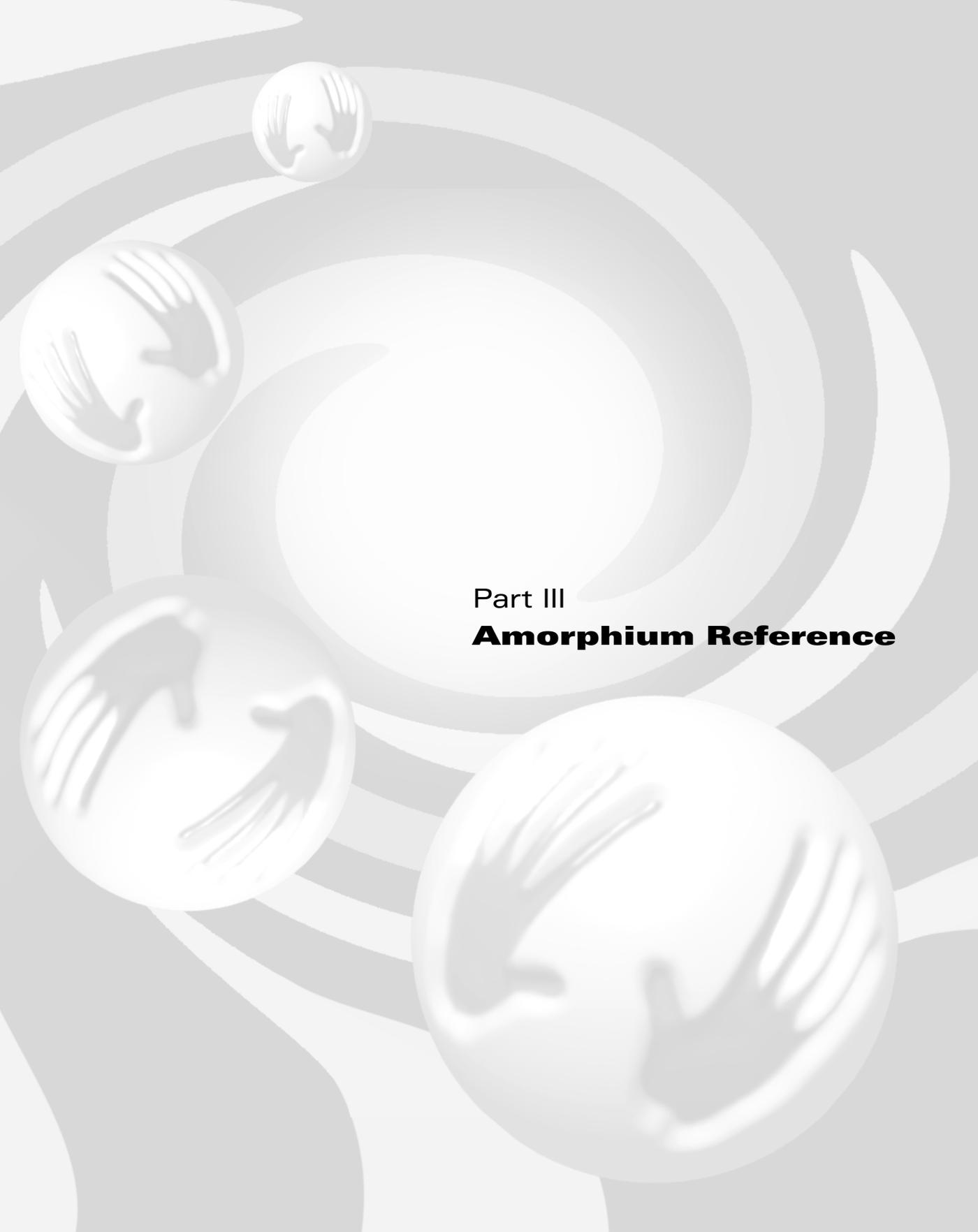
- Select **15 FpS**, **Animated GIF** Compression, and **Normal** Quality.

Check the following Render Options: Antialiasing, Shadows, and Textures. (If you forget to check these, all you will be animating is a simple can with no surface features.)

- Click **OK**.

The rendering process will begin. While the Amorphium render engine is very fast, it will still take time to render your animation. If you've created many key frames with a combination of distortions, higher frame rates, higher quality, and features like anti aliasing, shadows, and textures, then Amorphium has got serious number crunching to do. When your animation has finished rendering, the playback will begin automatically.



The background features a series of concentric, overlapping circles in various shades of gray, creating a sense of depth and movement. Four white, three-dimensional spheres are scattered across the scene, each with a dark, shadowed area on its surface, suggesting a light source from the upper left. The overall aesthetic is clean, modern, and minimalist.

Part III

Amorphium Reference

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Chapter 13: Tools, Buttons, & Menus

13.1 Introduction

Amorphium has been designed to provide you with the most intuitive, interactive 3D sculpting experience possible. Whenever possible, Amorphium's tools provide interactive feedback—as you adjust a value, you see the results happen on screen. All of Amorphium's tools are no more than a click or two of the mouse away. This chapter will cover each type of control you will find, and how to use them.

13.2 Interactive Tools

The best way to create a 3D object is to be able to view any changes you make as you make them—just like the real world. If we take the example of sculpting clay, if you mold a piece of clay with your hands, you can push and pull on it at will, and look at it from every direction.

Most of Amorphium's tools work this way, too. These are the **Interactive Tools**. The **Distorts** are a good example (*figure 13.1*).

Distorts	Rotate	Noise	Bottle	Shear
	Bank	Smooth	Bulge	Bend
	Scale	Waves	Button	Radial Shear
	Stretch	Tsunami	Belly	Taper
	Center	Equalize	Flatten	Twist
	Undo	Contrast	Spikes	Twirl

figure 13.1: The Distorts—an Example of Amorphium's Interactive Tools

Using Interactive Tools

To use an Interactive Tool,

- Move your pointer over the desired tool (we'll use **Noise** for this example).

You will see the tool highlight, and the pointer will change into an arrow (figure 13.2).



figure 13.2: Using an Interactive Tool

The pointer will take one of the following shapes (figure 13.3).



figure 13.3: The Pointers for Interactive Tools

- Click and hold over the tool and move the mouse in one of the directions indicated on the pointer.

You will see the tool applied to the object in the 3D workspace as you move the mouse.

- When you like what you see, release the mouse button.

Interactive Undo

If you look at the **Distorts**, you will see that **Undo** is one of them. In Amorphium, Undo is interactive. You can undo the previous operation anywhere from 0 to 100%, with the results visible at all times.

13.3 Direct Action Buttons

Direct action buttons are buttons that cause something to happen as soon as you click them. The **Compose Image** button (figure 13.4) is a prime example.



figure 13.4: The Compose Image button

13.4 Radio Buttons

Radio buttons appear in groups of at least two, one of which must be selected at all times. They get their name from old push-button radios. An example of radio buttons in Amorphium are the **Brush Tools** buttons (*figure 13.5*).

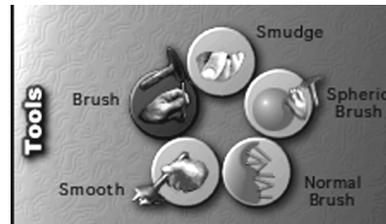


figure 13.5: The Brush Tools

Other radio buttons include the **Brushes** and **Brush Mode** buttons.

13.5 Pull-Down Menus

Pull-Down menus are activated by clicking on the button that contains them. In Amorphium, the **Project** menu (*figure 13.6*) is a good example.

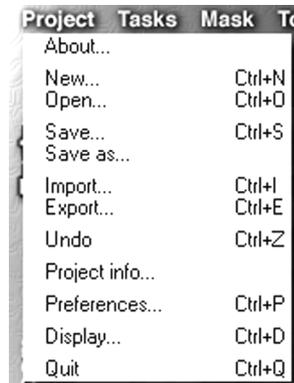


figure 13.6: The Project Menu

13.6 Triangle (Pop-up) Menus

You'll notice that several of Amorphium's tools have white triangles nearby (*figure 13.6*). When you click a white triangle, you will see a pop-up menu that contains useful options for the associated tool.

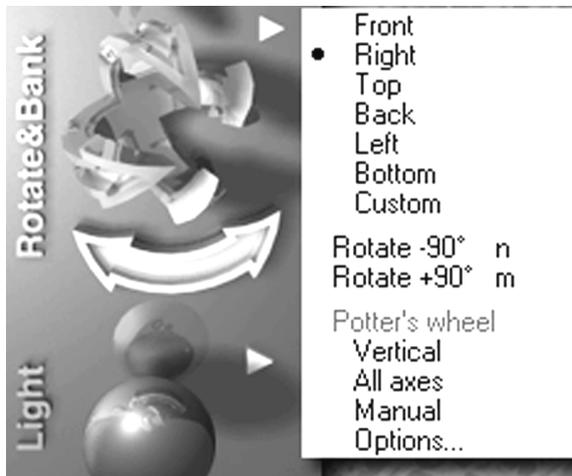


figure 13.6: The Rotate&Bank Triangle Pop-up Menu

13.7 Pop-up Menu

Some Amorphium tools give you fast access to options with a pop-up menu. The **Brush Symmetry** tool (*figure 13.7*) is a good example.



figure 13.7: The Brush Symmetry Tool's Pop-up Menu

When you click on the Brush Symmetry tool, a the menu containing all the Symmetry options appears. When you select one, the menu goes away, and the Brush Symmetry tool shows displays the option you selected.

13.8 Preview Boxes

A Preview Box allows you to adjust several settings for a tool at once, and monitor the changes interactively. The **Fog&Smoke Panel** (*figure 13.8*) shows the value of a preview box clearly.

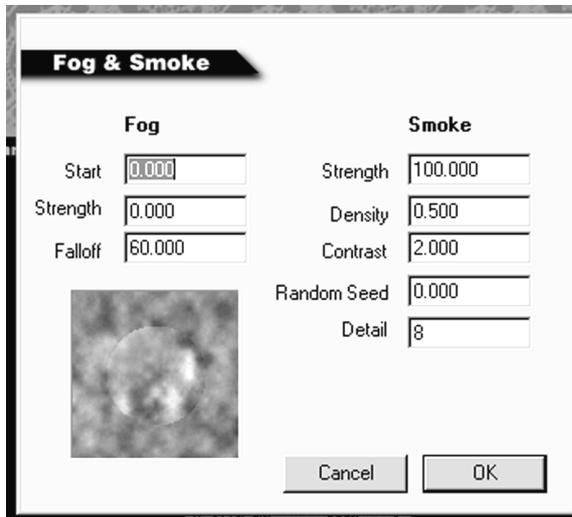


figure 13.8: The Fog&Smoke Panel

As you enter new values in any of the boxes, the preview box shows you how your settings will look when applied to the 3D workspace.

13.9 Panels

When a tool or menu item has multiple settings, you will find them grouped together in a panel (*figure 13.9*).

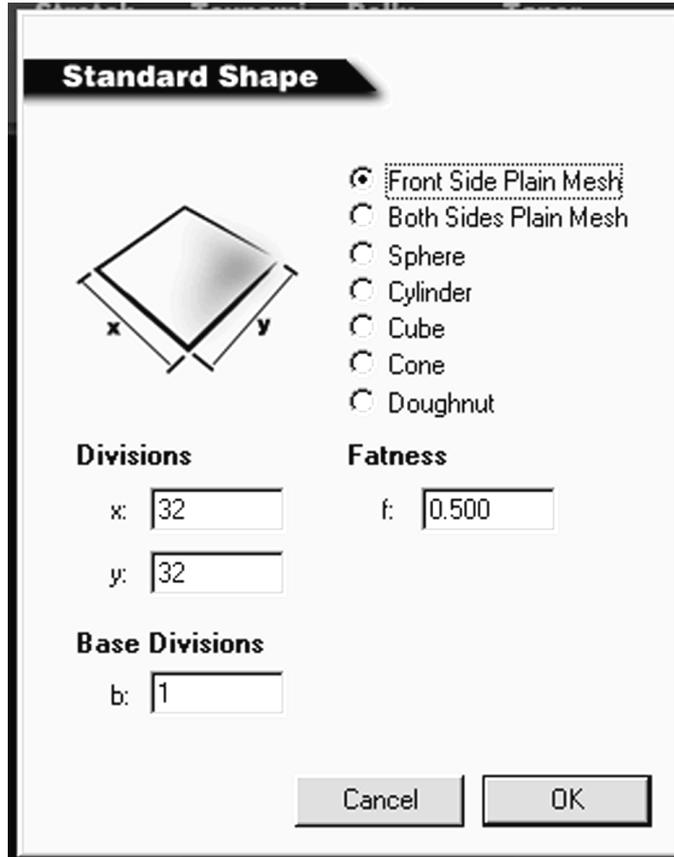


figure 13.9: A Typical Panel

In this example, the options for a **Standard Shape** (selected from the **New** menu located beneath the 3D workspace), are presented.

13.10 Color Palettes

Several of Amorphium's features deal with the color of an object, and there are two ways to set them: the pop-up palette, and the system palette.

Pop-up Palette You will find several square patches on the Amorphium interface that display a single color. If you click on one of these color patches, the pop-up palette (*figure 13.10*) will appear, allowing you to change the color of that option.



figure 13.10: A Pop-up Color Palette

In this case, the pop-up palette will affect the color of the **Diffuse** light which appears in the 3D workspace. The mouse pointer changes into an eye-dropper shape, and as you move it around on the pop-up palette, the color in the color patch above will display the color under the pointer. When the color patch displays the color you want, release the mouse button. The pop-up palette will go away, and the color you have chosen will be used for the option in question (Diffuse, in this case).

System Palette The other way to change colors in Amorphium is with the system palette. The system palette appears when you click one of the circular rainbow-hued but-

tons, The system palette you will see depends on whether you are using a Mac (figure 13.11) or a PC (figure 13.12).

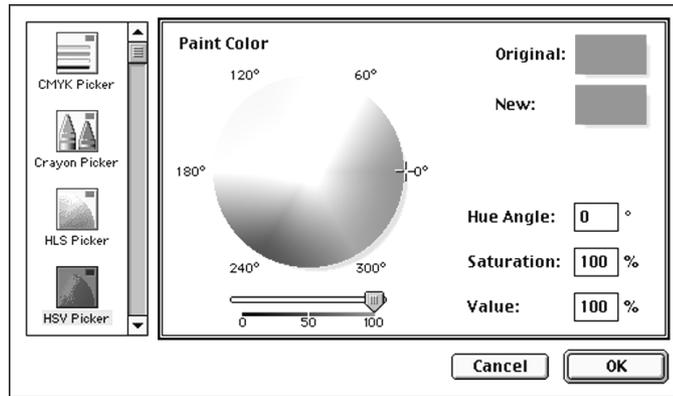


figure 13.11: The Mac System Palette

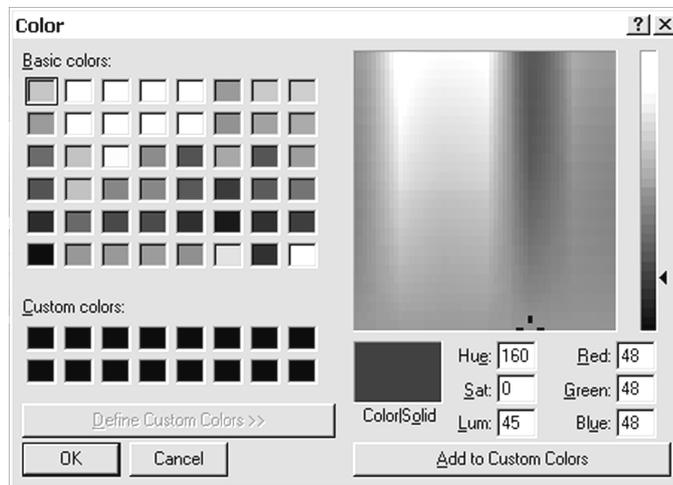


figure 13.12: The PC System Palette

In either case, these function like the pop-up palette.

Chapter 14: 3D Workspace

14.1 3D Workspace

The 3D workspace (*figure 14.1*) is where all the interesting stuff happens in Amorphium.

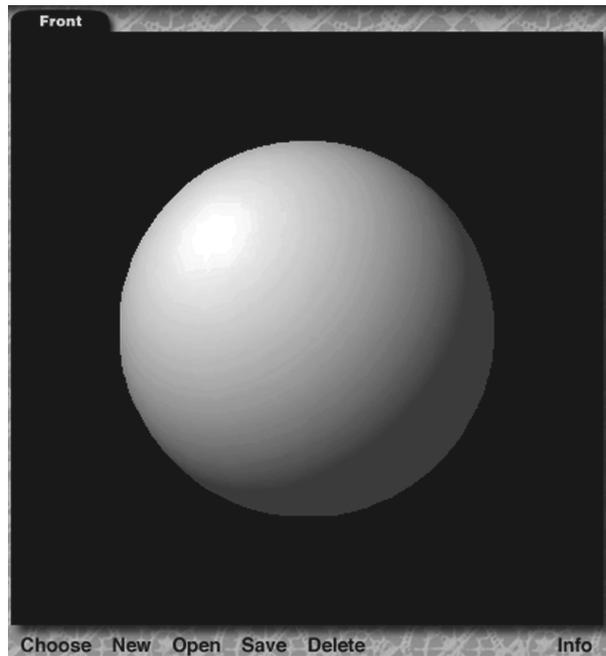


figure 14.1: The 3D Workspace and Object Menus

Objects you create or load appear here. When you use one of the interactive tools, you need only watch the 3D workspace to see the results of your work.

The 3D workspace is fixed in size—this helps Amorphium respond quickly under all modeling and sculpting conditions.

Changing Views

You can change the view by clicking the tab in the upper left of the 3D workspace (figure 14.2).

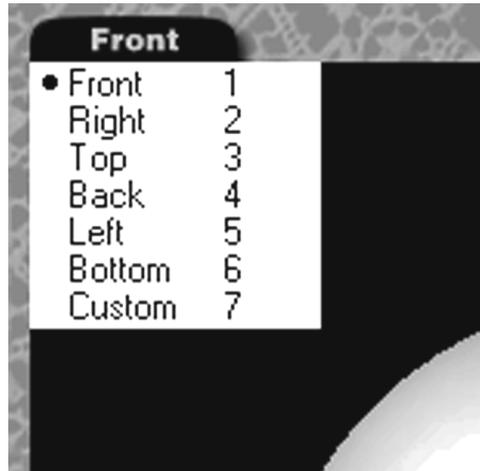


figure 14.2: View Tab at the Top of the 3D Workspace

- | | |
|--------|---|
| Front | Amorphium opens with the view set to Front . This is shown in the small tab at the top left of the 3D workspace. Select with the keyboard short cut 1 . |
| Right | View the object from its right side. Select with the keyboard short cut 2 . |
| Top | Sets the view to look down on the object from above. Select with the keyboard short cut 3 . |
| Back | View the object from behind. Select with the keyboard short cut 4 . |
| Left | View the object from its left side. Select with the keyboard short cut 5 . |
| Bottom | View the object from below. Select with the keyboard short cut 6 . |
| Custom | Any view other than one of the above six views. In other words, if you Move , Zoom , Rotate or Bank the object, you create a custom view. You can select this custom view with the keyboard shortcut 7 . |

The Object Menus

The menus just below the 3D Workspace are for managing objects, and are available in all modes except for Composer. These menus contain all the tools

to help you choose, create, save remove and get information about any object you may be working with.

14.2 All About Objects

In Amorphium, you will work with two different kinds of objects: **Organic**, and **Synthetic**.

Organic Objects

Organic objects are the primitive objects that Amorphium generates for you:

- Sphere
- Tetrahedron
- Cylinder
- Cube
- Cylinder with Caps

Primitives

These primitive objects are found in the New (Object) menu. Primitive, in this case, refers to the lack of geometric complexity of this type of object. It is in no way intended to put them down, or imply that they are not just as good as other, more complex shapes.

Synthetic Objects

All other objects in Amorphium are considered **Synthetic Objects**. Examples of Synthetic Objects include:

- Objects created from the **Standard Shapes Panel**
- Text objects created with **FontMan**
- Objects modified with **MeshMan**
- Any object imported into Amorphium from another program

14.3 Choose

To keep things simple, only one object is visible at a time in Amorphium, and any tools you apply only affect the visible object (of course, you can **Merge**

objects to create new ones as well). The **Choose (Object)** menu (*figure 14.3*) allows you to select the object you wish to edit.

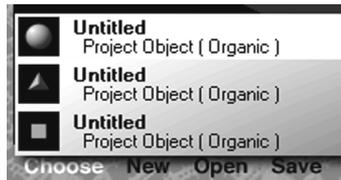


figure 14.3: The Choose Object Menu

Each object, along with its name and a small picture, appears on this menu, with the currently selected object highlighted.

14.4 New

The **New (Object)** menu (*figure 14.4*) provides you with options for creating new objects. The currently selected object appears at the bottom of the menu.

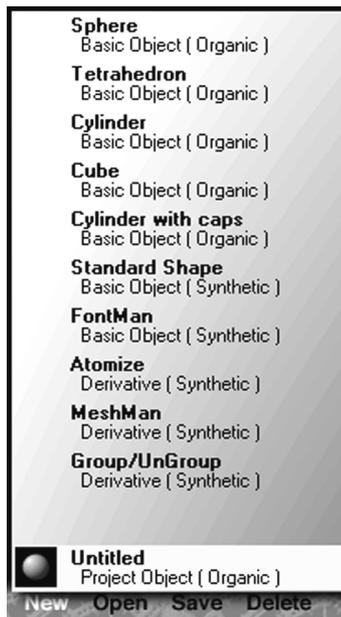


figure 14.4: The New Object Menu

- Sphere** Selecting **Sphere** creates a Sphere in the 3D workspace, which becomes the currently selected object.
- Tetrahedron** Selecting **Tetrahedron** creates a tetrahedron (a 3-sided pyramid) in the 3D workspace, which becomes the currently selected object.
- Cylinder** Selecting **Cylinder** creates an open-ended cylinder in the 3D workspace, which becomes the currently selected object.
- Cube** Selecting **Cube** creates a cube in the 3D workspace, which becomes the currently selected object.
- Cylinder with Caps** Selecting **Cylinder with Caps** creates a closed cylinder in the 3D workspace, which becomes the currently selected object.
- Standard Shape** Selecting **Standard Shape** opens the Standard Shape Panel (*figure 14.5*) which lets you create seven different kinds of objects.

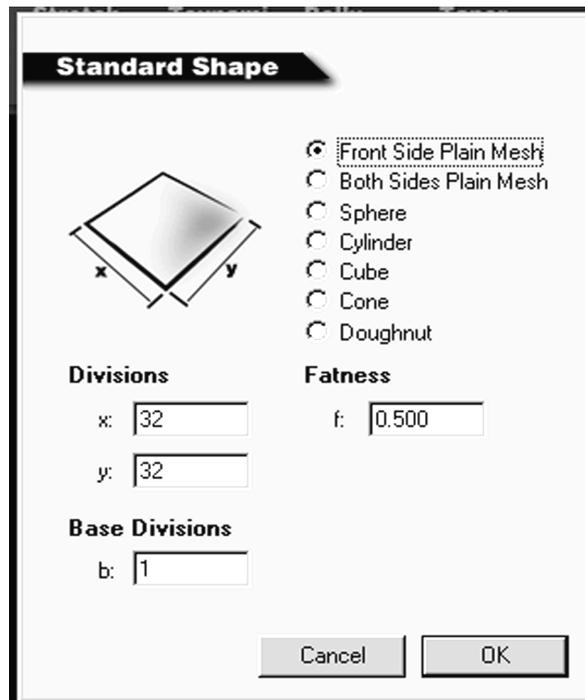


figure 14.5: The Standard Shape Settings Panel

When you select one of these shapes, a representation of the shape appears in the space to the left of the object list. Depending on the shape, you will also see several dimensions listed, such as x, y or b. You can set these dimensions to whatever value you like, in each case, higher values divide the object into more parts, which makes for a smoother object.

Divisions (x)	Determines the number of divisions in the x dimension, typically the width or circumference of the object.
Divisions (y)	Determines the number of divisions in the y dimension, typically the height of the object.
Base Divisions (b)	Determines the number of radial divisions the Cone and Cylinder objects.
Fatness (f)	Controls the thickness of the Doughnut (mmmm, doughnuts) object.
Front Side Plain Mesh	Creates a simple, one-sided flat square in the 3D workspace. It's important to note that this is a 2-dimensional object, and since it only has one side, it will disappear if you look at the underside. You might use this to form the top of a object which is never visible from the inside, such as a closed box, for example.
Both Sides Plain Mesh	Creates a simple, two-sided flat square in the 3D workspace. Note that this is also a 2-dimensional object, but is visible from both sides.
Sphere	Creates a Sphere in the 3D workspace. Use this Sphere (instead of the primitive) if you need a smoother object with more polygons.
Cylinder	Creates a cylinder in the 3D workspace. Use this cylinder (instead of the primitive) if you need a smoother object with more polygons.
Cube	Creates a cube in the 3D workspace. Use this Cube (instead of the primitive) if you need a smoother object with more polygons.
Cone	Creates a cone in the 3D workspace
Doughnut	Creates a doughnut (mmmm, doughnuts), which is also known as a torus, in the 3D workspace.
Cancel/OK	Press Cancel to continue working in Amorphium without keeping the new Standard Shape, or OK to create the new shape in the 3D workspace.

FontMan Selecting **FontMan** from the New menu opens the FontMan Panel (*figure 14.7*), which allows you to create 2D or 3D text using any TrueType font installed on your computer.

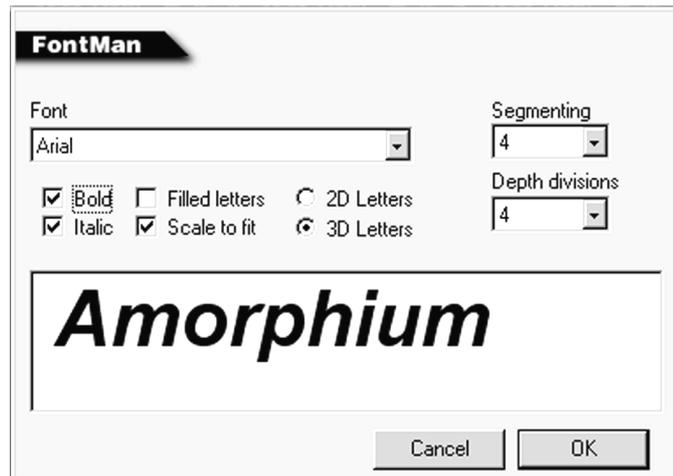


figure 14.7: The FontMan Panel

- Text Box** The text box at the bottom of the FontMan panel displays any text you type in in whatever font or style you choose.
- Font List** This menu contains all the fonts available for use in Amorphium. When you select a font and type some text into the text box, the text appears in the selected font.
- Bold** Check this option to use the bold version of the selected font. Any text already in the text box, or any more you type will be affected.
- Italic** Check this option to use the italic version of the selected font. Any text already in the text box, or any more you type will be affected.
- Filled Letters** Check this option if you want Amorphium to create solid letters. For example an “o” will be become a solid disc, with no hole in the center.
- Scale to Fit** This option tells Amorphium to make all the text visible in the 3D workspace when it is created.
- 2D/3D Letters** Allows you to create the text as either a 2D or 3D object.

- Segmenting Determines the number of polygons along the faces of the text. More segmenting means more polygons and thus a smoother appearance.

- Depth Divisions Determines the number of divisions along the depth of 3D text.

- Cancel/OK Press **Cancel** to continue working in Amorphium without keeping the new text, or **OK** to create add it to the 3D workspace.

- Mesh Man Selecting **MeshMan** from the New menu opens the MeshMan panel (*figure 14.8*).

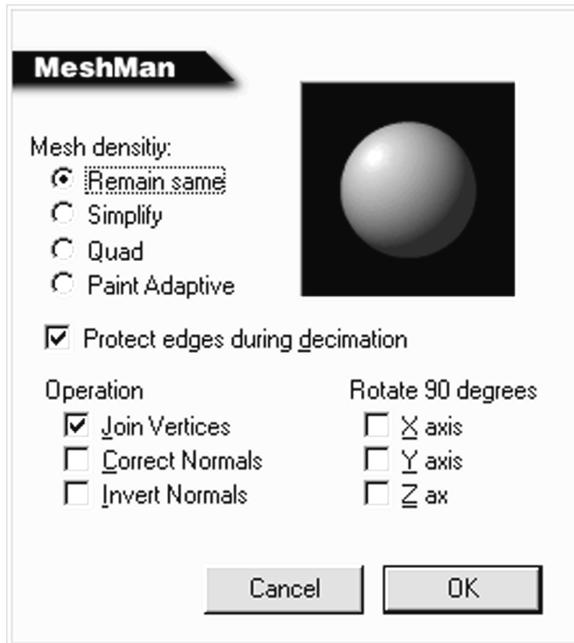


figure 14.8: The MeshMan Panel

MeshMan, which is short for Mesh Manipulation, creates a new object based on the object currently in the 3D workspace. It increases or decreases the number of polygons in the object (the object's mesh density), can modify the objects normals, or perform a single rotation of 90 degrees on any axis.

Mesh Density Options

Remain	Leaves the mesh density undisturbed so that you can just use the Operation or Rotate 90 Degrees features.
Simplify	Selecting this option will cause MeshMan to reduce the number of polygons in the object by a factor of four. This will create a rougher object.
Quad	Selecting this option will increase the number of polygons by a factor of four, making for a smoother object.
Paint Adaptive	Selecting this option lets you control the mesh by painting on it. You can simultaneously simplify, quad and leave the object as is depending on the colors you paint it. Here's how it works: <ul style="list-style-type: none"> • To Simplify any area of the object, paint it black • To Quad an area, or areas of the object, paint them white • To make an area, or areas Remain the Same, paint them gray.
Protect Edges During Decimation	Prevents MeshMan from removing polygons along the edge of an object. The edges are critical areas, by protecting them whenever you use MeshMan, you will end up with smoother objects.

Operations

Join Vertices	This option knits together the vertices of the model. Use it if an imported model breaks apart when you morph it, or apply brush tools.
Correct Normals	can be used on models that you have imported into Amorphium if parts of these models shade black.
Invert Normals	can be used on models that you have imported into Amorphium if these models won't shade at all.
Rotate 90 Degrees	These options apply 90 degrees of rotation to the object along the axes you select: x, y or z.
Group/Ungroup	Group/Ungroup allows you to put back together or break apart any object you've imported into Amorphium which includes a built-in hierarchy.

Some modeling and animation applications allow you to group models together in a parent/child relationship. Amorphium will treat these hierarchies of models as a single model unless you **Ungroup** them. You can Ungroup the models, perform operations on them individually, then **Group** them back

together when you are finished. This makes it quite simple to treat different parts of a complex object one at a time, using entirely different tools on each part.

A good way to think of Group/Ungroup is like having an option to take apart a plastic airplane kit after it has been glued together, so you can paint the individual pieces with different colors and textures.

14.5 Open

When you want to load a model into Amorphium, click on the word **Open**, located under the 3D workspace. This brings up the **Open Object** window (figure 14.9), giving you access to any Amorphium format (.cmf) models on your computer's hard drives, CD-ROM drive, network connections, etc.



figure 14.9: The Open Object Window (PC version)

To see a preview of an object, click on it in the file area of the window—you will see the preview, plus number of triangles, vertices, any textures, and a description, if you saved it with one. The open command is only for models

saved in Amorphium's **cmf** format. To load models saved in other formats, use the **Import Object** panel, found under the **Project** menu.

14.6 Save

When you want to save the object in the 3D workspace to your computer's hard drive, click on the word **Save**, located under the 3D workspace. This opens the **Save Object** window (figure 14.10).

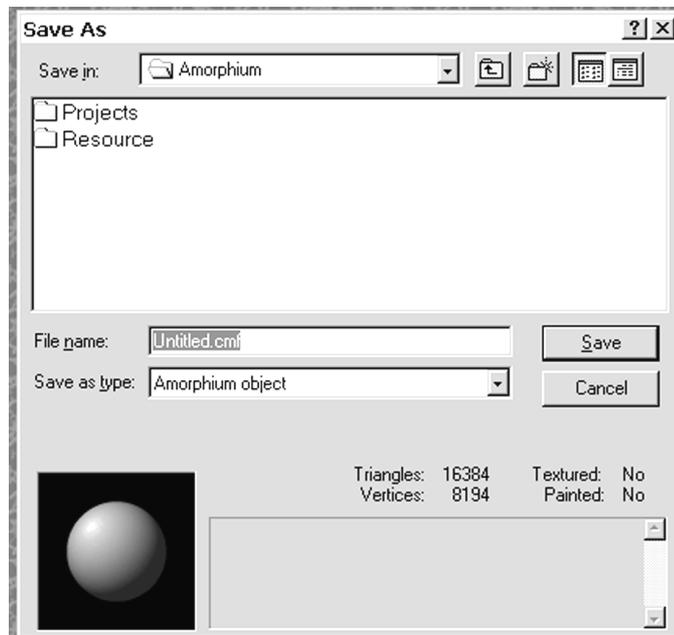


figure 14.10: The Save Object Window (PC version)

From here, name the object and pick a directory on your computer's hard drive to save it in. You will see a preview of the object, as well as other important information about it. Before you save it, you may also type in a description of the object in the box next to the preview.

Objects are saved in Amorphium's **cmf** format. If you want to save an object with a different format, choose the **Export Object** panel, available on the **Project** menu.

14.7 Delete

To delete the object in the 3D workspace, click on the word **Delete** located under the 3D workspace. If there are unsaved changes on the object, Amorphium will offer you a chance to save it first. Delete affects only the object currently visible in the 3D workspace.

14.8 Info

To find information about the current object, click the word **Info** found under the 3D workspace. This opens the **Object Info** panel (figure 14.11).

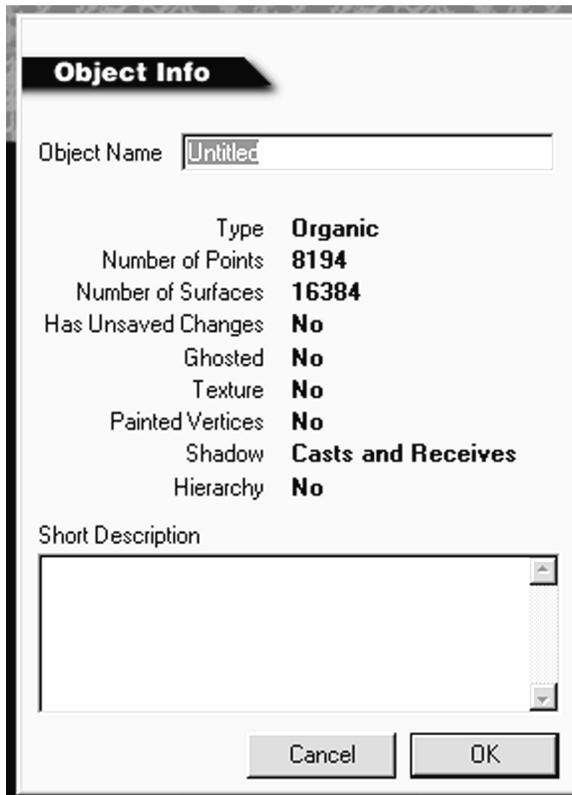


figure 14.11: The Object Info Panel

Here you will find basic data on the object. This includes number of vertices and polygons that make it up, the objects name, and a short description, if you want to create one.

14.9 Drawing & 3D Acceleration

One of the ways Amorphium provides such a fast, responsive modeling experience, is through the use of its highly-optimized drawing engine. Amorphium can actually use several different drawing engines, and these engines, and their settings are found on the **Drawing Options** menu (*figure 14.12*).

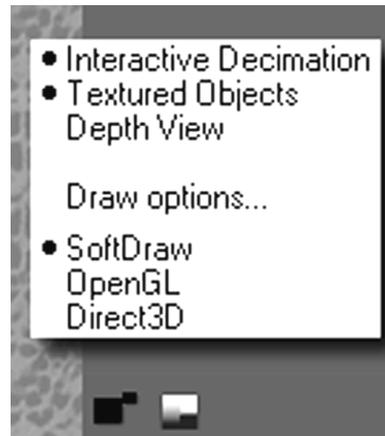


figure 14.12: The Drawing Options Menu (PC version)

Drawing Engines	The drawing engine is the determines how Amorphium updates the 3D workspace while you are doing things like sculpting or moving an object, or applying one of the interactive tools.
SoftDraw	This is Amorphium's default drawing engine. It was developed specifically for Amorphium, and will provide you with the fastest response in almost all modeling situations.
OpenGL	OpenGL can sometimes provide faster response when banking and rotating objects, but is slower than SoftDraw for sculpting.
Direct3D (PC Only)	Often provides good performance, but is highly dependent on the video card in your PC.

**QuickDraw 3D
(Mac Only)**

Good overall performance, but depends heavily upon the graphics card installed in your system.

Object Drawing Options

At the top of the menu are found settings that control how objects are drawn on the Amorphium screen. These options affect all objects and are the same regardless of the drawing engine you have selected.

Interactive Decimation

Selecting this option tells Amorphium to temporarily reduce the number of polygons in an object when any of Amorphium's interactive tools are applied to it. This increases performance, and has no permanent effect on the object.

Textured Objects

Selecting this option instructs Amorphium to draw any textures you may have applied to your objects (*Chapter 24*).

Depth View

The **Depth View** option toggles the drawing mode of the 3D workspace from **Normal Shading** to **Depth Shading**. In **Depth Shading**, parts of the object that are closer to you appear brighter, while those farther away appear darker—regardless of the positioning of the light.

Draw Options for PC

If you are using Amorphium on a PC (*PCs are cool!*), selecting **Draw Options**, opens a panel (*figure 14.13*) which allows you to set options for the **OpenGL** and **Direct3D** drawing engines.

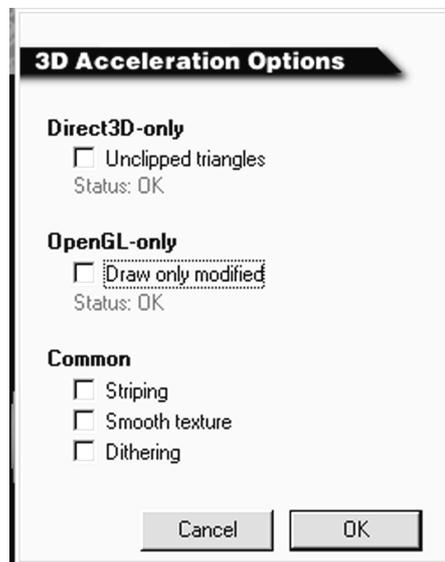


figure 14.13: The 3D Acceleration Options Panel for the PC Version of Amorphium

**Draw Options
for Mac**

On the other hand, if you are using Amorphium on a Mac (*Macs are cool!*), selecting Draw Options, opens a panel (*figure 14.13*) which allows you to set options for the QuickDraw3D drawing engine.

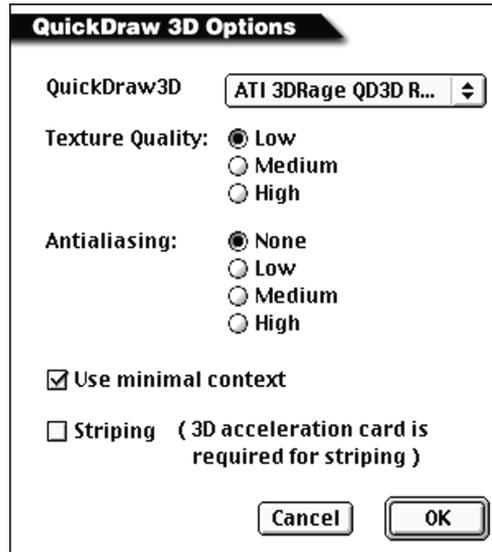


figure 14.14: The Draw Options Panel for the Mac Version of Amorphium



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Chapter 15: View Controls

15.1 Move&Zoom

The Move&Zoom tools (*figure 15.1*) are used to manipulate the object in the 3D workspace.



figure 15.1: The Move & Zoom Tools

Moving an Object

To move an object around on the 3D workspace:

- Move the pointer over the **Move** tool (shaped like a plus sign).

The pointer will turn in to a four-headed arrow (resembling the Move tool itself), indicating that you can move the object by moving the mouse up/down and left/right.

- Click and hold the mouse button, then move the mouse, paying attention to the object in the 3D workspace.
- Release the mouse button when the object is positioned to your liking.

That takes care of moving the object around in the plane of the monitor (up/down, left/right), but if we want to move the object closer/further away, we need to use the Zoom tool.

The Zoom tool—below and to the left of the Move tool—is used to zoom the object in and out. This will have the apparent effect of making the object larger or smaller.

Zooming an Object

To zoom in or out on an object:

- Move the pointer over the **Zoom** tool (the two-headed arrow pointing into the screen).

The pointer will turn in to a two-headed arrow (somewhat reminiscent of the Zoom tool itself), indicating that moving the mouse up and down will change the zoom.

- Click and hold the mouse button, then move the mouse up or down, paying attention to the object in the 3D workspace.
- Release the mouse button when the object is as close or far away as you want it.

Move & Zoom Menu

The white triangle to the upper right of the **Move** tool contains a menu (*figure 15.2*) with other ways of moving objects.



figure 15.2: The Move&Zoom Menu

Fit Object	Zooms in on the object as far as possible, while keeping the object entirely visible in the 3D workspace.
Reset View	Returns the 3D workspace to its default position, discarding any Move or Zoom commands.
Reset All Views	Works the same way as Reset View , but also resets the Dual View .

15.2 Rotate&Bank

The Rotate&Bank tools (*figure 15.3*) allow you to interactively rotate the object in the 3D View.



figure 15.3: The Rotate&Bank Tools

Rotating an Object

To rotate an object on the 3D workspace:

- Move the pointer over the **Rotate** tool.

The pointer will turn in to a four-headed arrow, indicating that moving the mouse up/down and left/right will rotate the object.

- Click and hold the mouse button, then move the mouse, paying attention to the object in the 3D workspace.
- Release the mouse button when the object is positioned to your liking.

Rotation Shortcut!

There is a handy shortcut for rotating an object without using the Rotate tool. If you press the **control (ctrl)** on your keyboard, and then click anywhere in the 3D workspace, you will rotate the object, instead of brushing it. Just release the control key when you have finished rotating the object.

That takes care of rotating the object around the **x-** and **y-**axes. Rotating the object around the **z-axis** (imagine a line going straight into your screen) is called banking, and is controlled by the **Bank** tool (the curved arrow just below the **Rotate** tool).

Banking an Object

To bank an object:

- Move the pointer over the **Bank** tool.

The pointer will turn in to a horizontal two-headed arrow, indicating that moving the mouse left and right will bank the object.

- Click and hold the mouse button, then move your mouse left and right, paying attention to the object in the 3D workspace.
- Release the mouse button when the object is oriented properly.

Rotate & Bank Menu

The white triangle to the upper right of the **Rotate** tool contains a menu (*figure 15.3*) with other ways of moving objects. The upper tool, **Rotate**, is used to rotate the object on its X and Y axes. The **Bank** tools rotates the object on its Z axis. Beneath the white arrow is a pull-down menu that controls the views and the Potter's Wheel modes.

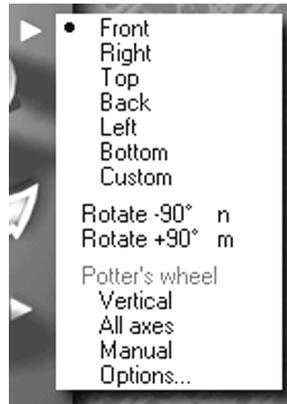


figure 15.4: The Rotate&Bank Menu

Set View The first seven items in this menu allow you to set your point of view of the 3D workspace. Note that these options are also available by clicking the tab in the upper left of the 3D workspace (*figure 15.5*).

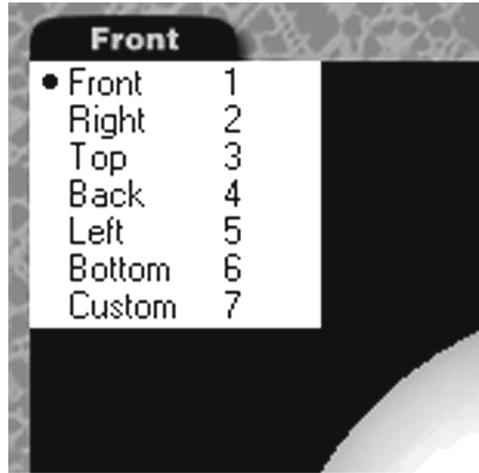


figure 15.5: Setting the View with the Tab at the Top of the 3D Workspace

- Front** Amorphium opens with the view set to **Front**. This is shown in the small tab at the top left of the 3D workspace. Select with the keyboard short cut **1**.
- Right** View the object from its right side. Select with the keyboard short cut **2**.
- Top** Sets the view to look down on the object from above. Select with the keyboard short cut **3**.
- Back** View the object from behind. Select with the keyboard short cut **4**.
- Left** View the object from its left side. Select with the keyboard short cut **5**.
- Bottom** View the object from below. Select with the keyboard short cut **6**.
- Custom** Any view other than one of the above six views. In other words, if you **Move**, **Zoom**, **Rotate** or **Bank** the object, you create a custom view. You can select this custom view with the keyboard shortcut **7**.
- Rotate - 90°** Rotates the view 90° counter-clockwise. Select with the keyboard short cut **n**.
- Rotate + 90°** Rotate the view 90° clockwise. Select with the keyboard short cut **m**.

15.3 Potter's Wheel

The Potter's Wheel is an extremely cool feature that causes the object in the 3D workspace to rotate continuously, like—well, like a piece of clay on a potter's wheel.

What makes this so cool is that you can paint and sculpt interactively while the object spins, which is great for painting and brushing. It is therefore possible to paint a spiral of color down the side of an object, for example

There are several settings for the Potter's Wheel feature:

- Vertical** Makes the object to begin spinning like a top (around its y-axis).
- All Axes** Causes the object to spin on all of its axes.
- Manual** Sets the object to spin only when you are brushing.
- Options** Selecting Options brings up the Potter's Wheel panel (*figure 15.6*).

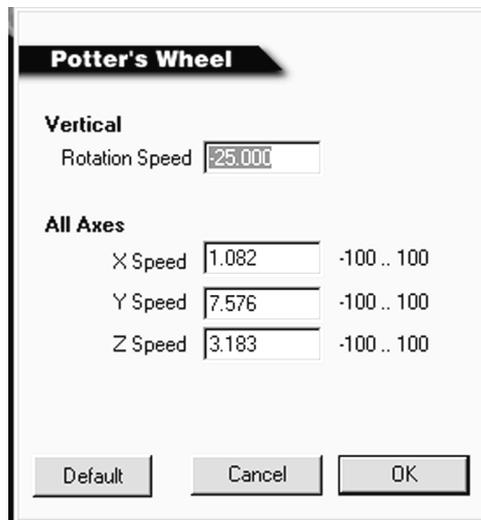


figure 15.6: The Potter's Wheel Panel

- Vertical** Sets the speed of rotation around the y-axis in degrees per second. The object spins from right to left for negative numbers, and from left to right with positive numbers.

All Axes	Allows you to set the speed of rotation, in degrees per second, around each of the x-, y- and z-axes when you are using the All Axes setting. You can enter values from between -100 to +100 for each.
Default	Sets all parameters to their default values.
OK/Cancel	OK closes the panel, accepting any changes you have made; Cancel closes the panel and ignores any changes.

15.4 Light

Amorphium uses a single light which you can position with the hemisphere-shaped Light tool (*figure 15.7*).

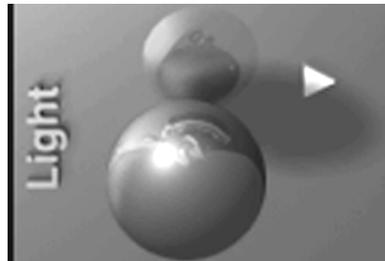


figure 15.7: The Light Tool

The current position of the light is represented by the highlight which appears on the Light tool.

Positioning the Light

The can be moved much the same way that an object is moved:

- Move the pointer over the **Light** tool.

The pointer will turn in to a four-headed arrow, indicating that the light can be positioned by moving the mouse up/down and left/right.

- Click and hold the mouse button, then move the mouse, paying attention to both the object in the 3D workspace, and the highlight on the Light tool itself..

Release the mouse button when the Light is positioned to your liking.

Light Menu

The white triangle to the upper right of the Light Tool provides you with access to the **Light Menu** (figure 15.8) which contains options for positioning the light.



figure 15.8: The Light Menu

You have the choice of moving the light to one of six preset positions: **Front**, **Right**, **Top**, **Back**, **Left**, and **Bottom**—with these position corresponding to the object views of the same name (see section 15.2).

Light Locked

Allows you to lock the light to its current position with respect to the object in the 3D workspace. That is, when you rotate the object, the light will rotate with it.

15.5 Lock Axes

The Lock Axes tools (figure 15.9), allow you to limit the rotation of an object to the selected axis.



figure 15.9: The Lock Axes Tools

For example, if you select the **Y** axis, then use the **Rotate Tool**. You will find that the object will only rotate around the **Y** axis, no matter how you move the mouse. This can be quite useful when you are doing precise work.

15.6 Dual View

The Dual View menu (figure 15.10), is accessible from the button in the bottom right-most corner of the Amorphium screen.



figure 15.10: The Dual View Menu

Selecting **Front**, **Right**, **Top**, **Back**, **Left**, **Bottom** or **Custom**, opens an additional, smaller 3D workspace to the right the main 3D workspace.

For example, If we are currently viewing the 3D workspace in **Custom** view, selecting **Top** from the Dual View menu opens the Dual View workspace in

Top view, next to the 3D workspace which remains in Custom view (figure 15.11).



figure 15.11: Dual View -Custom and Top

This can be a very useful tool when you need to see a certain part of an object while working on another.

Changing Views

Once the Dual View Workspace is open, you can select different views for it by clicking on the tab at the top, and selecting a different view from the menu which appears—this works just like the 3D workspace (see section 14.1, *3D Workspace*).

Chapter 16: Brushes & Brush Modifiers

16.1 Painting and Sculpting

Amorphium gives you not only the ability create 3D sculptures, but also to paint them (as well as other cool things—that's for other chapters, though!) . It's also a very simple matter to switch between painting and sculpting at any time. The tools that allow you to do this are the **Brushes** themselves (figure 16.6), and the **Brush Tools** (figure 16.5).

Sculpting

When you want to sculpt an object, you'll use the **Tools&Distorts** tools. These tools are visible when you first start Amorphium. If they are not visible:

- Click **Tools&Distorts** at the top of the Amorphium screen (figure 16.1).



figure 16.1: The Tools&Distorts Button

You should then see the Tools&Distorts tools (figure 16.2).

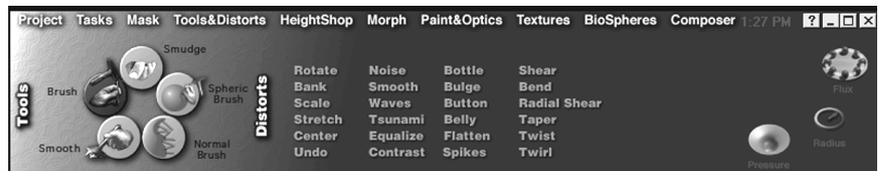


figure 16.2: The Tools&Distorts Tools

At this point, the tools you need to begin sculpting are all available. The next step is to select one of the **Brush Tools** (figure 16.5), and a **Brush** (figure 16.6), and you are ready to begin sculpting the object in the 3D workspace.

Painting

When you are ready to paint the object, you'll want the **Paint&Optics** tools:

- Click the **Paint&Optics** button at the top of the Amorphium screen (figure 16.3).

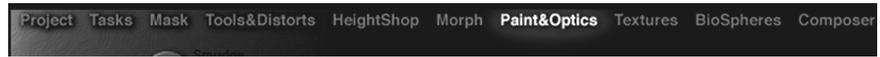


figure 16.3: The Paint&Optics Button

That will display the **Paint&Optics** tools (figure 16.4).

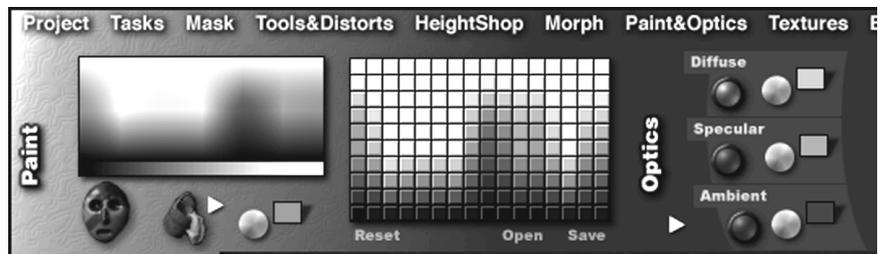


figure 16.4: The Paint&Optics Tools

When you open these **Paint&Optics** tools, the **Brushes** immediately switch functions from sculpting to painting. They can now be used to apply color to the object in the 3D workspace rather than change its shape.

You can switch between sculpting and painting at any time just by clicking either the **Tools&Distorts** button, or the **Paint&Optics** button.

Next, we'll take a closer look at the **Brush Tools** and **Brushes**.

16.2 Brush Tools

There are five **Brush Tools** (figure 16.5) which, together with the **Brushes**, allow you to sculpt objects in Amorphium.

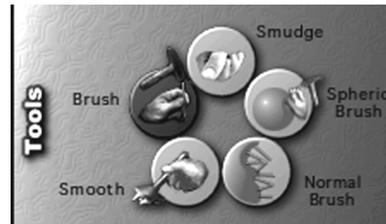


figure 16.5: The Brush Tools

In essence, the **Brush** provides the shape, and the **Brush Tool** describes how that shape will be applied to the object. That's all there is to it. Let's get to know the five **Brush Tools** a little better.

Brush **Brush** is the default Brush Tool. When you It allows you to draw across the surface of a three-dimensional object, changing the objects geometry as you go. The shape of the change is a function of which brush you select, the brush's radius, pressure, flux, the brush mode, tilt, symmetry, and any masks or snaps you may have applied to the object. Brushing takes place perpendicular to the view plane.

Spheric Brush is nearly identical to Brush except that brushing takes place in a direction toward the center of mass of the object.

Normal Brush Let's just say this straight out. **Normal Brush** didn't get its name because it's "ordinary" or "average." To understand it properly, we need to grasp a concept which appears frequently in 3D modeling and animation: the concept of the **Surface Normal**.

A **Surface Normal** is an imaginary line which sticks straight out (perpendicularly) from the center of a polygon. Remember that objects are made up of polygons. The purpose of a **Surface Normal** is to show us exactly which direction in 3D space the polygon is facing.

Now that we know about **Surface Normals**, it's easy to explain what the **Normal Brush** does—it always sculpts straight into (perpendicularly) any surface across which it is moved. Think of a caterpillar crawling over every inch of a

rock, then later flying straight over the same rock as a butterfly and you'll see the difference between **Normal Brush** and **Brush**.

Smudge Smudge works a little differently from **Brush**, **Spheric Brush** and **Normal Brush** in that it pushes on the surface of the object rather than sculpting it. Imagine pushing your thumb along the surface of a block of molding clay and you'll—that's just how Smudge affects an object.

Smooth **Smooth** provides you with a very useful touchup function. Use it to smooth over unwanted creases or other blemishes in an object's surface.

16.3 Brushes

The **Brushes** (*figure 16.6*), on the right side of the screen, are a set of shape tools that work with the **Brush Tools** to sculpt objects with the **Tools&Distorts** tools, and paint them with the **Paint&Optics** tools.



figure 16.6: Amorphium's Brushes

In addition, brushes are used to modify texture maps, and with the **Morph** and **HeightShop** features of Amorphium as well.

Brush Snapping

To aid in using the brushes, Amorphium supports snap points. These points are added and removed from an object by holding down the **Alt** key on the **PC** or **Option** on the **Macintosh** and clicking on the surface of the object.

A black dot will appear where you click. As you paint or brush on the surface, your cursor will change (a small circle is added to the lower right portion of the cursor) when you move over a snap point. Amorphium will attempt to brush or paint as close to the snap point as possible.

16.4 Brush Pressure, Radius & Flux

These tools are used to set the characteristics of the brushes. The tools work by placing the cursor over them, pressing the mouse button, and dragging left or right. The tools all have interactive feedback. The Pressure and Radius tools are themselves modified. The Radius tool indicates change with a circle placed over the center of the 3D view.

Pressure Pressure is used to control how much the brush pulls or pushes on the object.

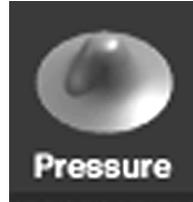


figure 16.2: The Brush Pressure Tool

Set the brush pressure by clicking on it and moving the mouse left or right as indicated by the arrow cursor. You will see a number appear above the Pressure tool (*figure 16.3*).

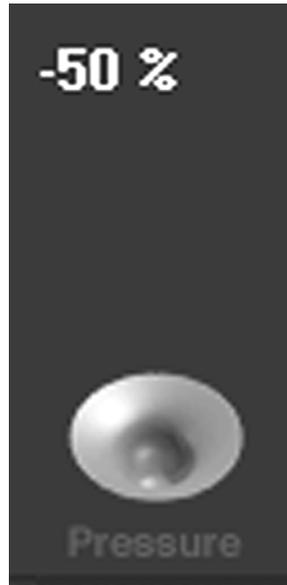


figure 16.3: Setting the Brush Pressure

This number indicates the current pressure, and the pressure icon itself changes to indicate this pressure. Negative pressure pushes in on the object, Positive pressure pulls out on the object.

Radius Radius sets the radius of effect of the brush.



figure 16.4: The Brush Radius Tool

When you set the radius of the brush, a number appears above the radius tool as with the pressure tool, and the actual radius appears as a circle in the 3D workspace (*figure 16.5*).

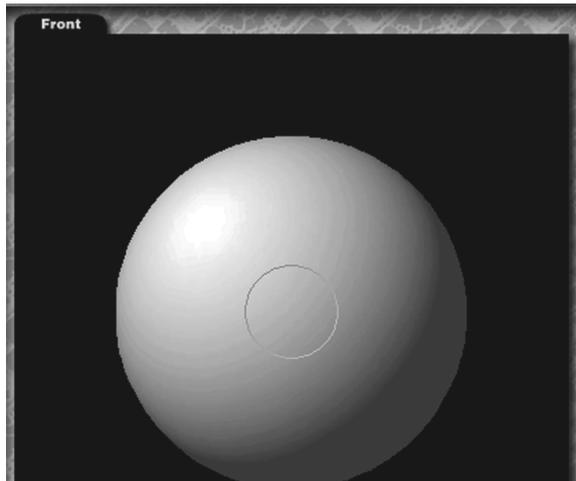


figure 16.5: Setting the Brush Radius

Flux Flux controls the flow pressure or paint from the brush.

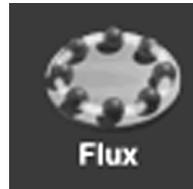


figure 16.6: The Brush Flux Tool

16.5 Brush Mode

The Brush Mode tools (*figure 16.7*) show how the brushes behave while in Tools&Distorts mode. There are three modes.



figure 16.7: The Brush Mode Tools

Front The **Front** Brush Mode sets the brush to act on the front surface only of the object in the 3D workspace.

Both Sides The **Both Sides** Brush Mode sets the brush to act in the same direction on the front and back surface of the object it is applied to. It pushes in on one side while pulling out the other.

Mirror The **Mirror** Brush Mode sets the brush to act in opposite directions on the front and back surface of the object it is applied to. It pushes in on both sides at once or pulls out on both sides at once.

16.6 Symmetry & Tilt

Symmetry

The Symmetry tool (*figure 16.8*) modify the drawing behavior of the brushes.

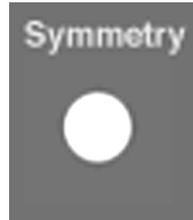


figure 16.8: The Brush Symmetry Tool

Instead of brushing a single stroke, multiple strokes in the patterns shown below will be drawn.

When you click on the Symmetry Tool, the Brush Symmetry Options pop-up menu (*figure 16.9*) will appear.



figure 16.9: The Brush Symmetry Options Pop-up Menu

Select the type of symmetry you wish to use by moving your cursor over it and releasing the mouse button. The symmetry tool will reflect the type of symmetry you have selected (*figure 16.10*).

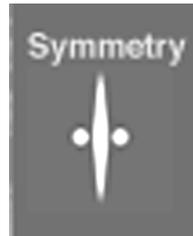


figure 16.10: 2-Way Mirror Symmetry Selected

Tilt Tilt causes the brush to simulate the behavior of an airbrush, even if you are not using a graphics tablet with an airbrush. The action of the brush will be more concentrated at the initial point of contact but will spread out widely in the direction of tilt.

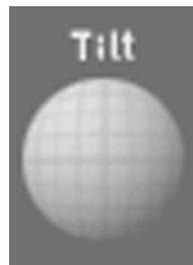


figure 16.11: The Brush Tilt Tool

Setting the Tilt To set the tilt, click on the Tilt tool. A sphere with a movable point will appear (figure 16.12).

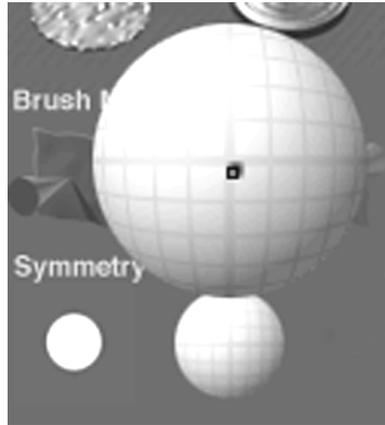


figure 16.12: Setting the Brush Tilt

Move the point to the desired location, then release the mouse button.

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Chapter 17: Tools & Distorts

17.1 Introduction

When you first open Amorphium, the Tools&Distorts functions are displayed at the top of the interface (*figure 17.1*).

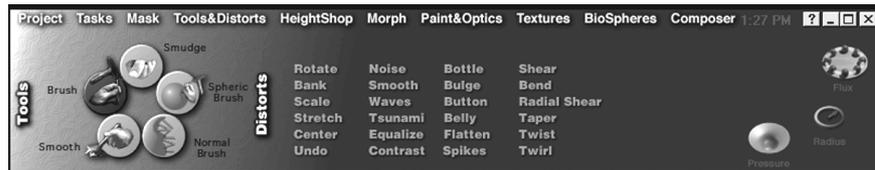


figure 17.1: Amorphium's Tools&Distorts

17.2 BrushTools

There are five **Brush Tools** (*figure 17.2*) which, together with the **Brushes**, allow you to sculpt objects in Amorphium.

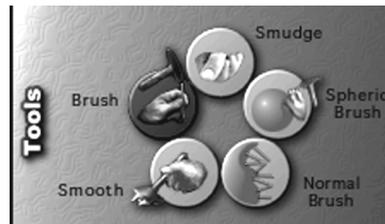


figure 17.2: The Brush Tools

Brush **Brush** is the default Brush Tool. You use it for sculpting by clicking the mouse button and dragging the pointer across objects. The shape of the sculpting is a function of which brush you select, the brush's radius, pressure, flux, the brush mode, tilt, symmetry, and any masks or snaps you may have applied to the object. Brushing takes place as if the brush were mounted on a straight rail in front of the object—all sculpting occurs in the same direction regardless of which part of the object is being sculpted.

Spheric Brush **Spheric Brush** is closely related to **Brush** except that the brush sculpts towards the center of the object, as if it were attached to it by a string. No mat-

ter which part of the object you are sculpting, the brush always points to the center.

Normal Brush

Let's just say this straight out. **Normal Brush** didn't get its name because it's "ordinary" or "average." To understand it properly, we need to grasp a concept which appears frequently in 3D modeling and animation: the concept of the **Surface Normal**.

A **Surface Normal** is an imaginary line which sticks straight out (perpendicularly) from the center of a polygon. Remember that objects are made up of polygons. The purpose of a **Surface Normal** is to show us exactly which direction in 3D space the polygon is facing.

Now that we know about **Surface Normals**, it's easy to explain what the **Normal Brush** does—it always sculpts straight into (perpendicularly) each surface across which it is moved.

To envision the difference between **Normal Brush** and **Brush**, just think of how a caterpillar moves vs. a butterfly—first crawling over every inch of a rock, then later flying over it in a straight line.

Smudge

Smudge works a little differently from **Brush**, **Spheric Brush** and **Normal Brush** in that it pushes on the surface of the object rather than sculpting it. Imagine pushing your thumb along the surface of a block of molding clay and you'll—that's just how **Smudge** affects an object.

Smooth

Smooth works in a similar manner to **Smudge**, but works better for touching up an object. Use it to smooth over unwanted creases or other blemishes in an object's surface.

17.3 Distorts

The Distorts (*figure 17.3*) give you the ability to deform an entire object at once, with interactive control.



figure 17.3: The Distorts

Using the Distorts

To use one of the distorts:

- Move the pointer over one of the distorts (Waves, for example).

The distort will highlight, and the pointer will turn into either a two- or four-headed arrow, which indicates which directions you can move the mouse to apply the distort.

- Click and hold the mouse button, and move the pointer in one of the directions indicated by the pointer (up and down and/or left and right).

Watch the object in the 3D workspace as you apply the distort. The object, along with its materials and texture, is modified interactively as you drag the mouse. The percentage of application is displayed in the upper right-hand corner of the Amorphium screen.

Distorts may be combined in to create very imaginative effects. Starting with simple primitives, and doing nothing else but applying distorts can yield some very interesting objects.

Rotate Rotates the object on its X and Y axes. This functions in the same way as the **Rotate** tool (*Chapter 15, section 2*).

Bank Rotates the object on its Z axis. This functions in the same way as the **Bank** tool (*Chapter 15, section 2*)

Scale Scale changes all proportions of the object equally. In other words, if you scale a sphere you will end up with a smaller or larger sphere. Similarly, if you scale a penguin you will end up with a smaller or larger penguin.

Stretch Stretch works in two dimensions--move the mouse up or down to make the object taller or shorter and move the mouse left or right to make the object thicker or thinner, or any combination thereof. You will see two percentage numbers, one for each dimension.

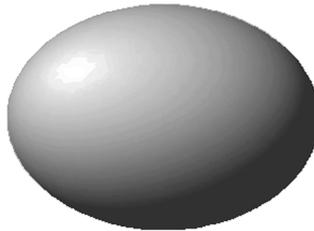


figure 17.4: Sphere with +25% Wide, -25% Tall Stretch Applied

Center Moves the object toward the center of the 3D workspace.

Undo Undo interactively removes the effects of the last command. The amount that the effect can be undone is between 0 and 100%. This is particularly handy if you have applied an effect that you don't really want to completely undo—you'd just like to reduce its intensity.

Smooth Smooths out the creases in the object. This distort is essentially the opposite of Noise.

Waves

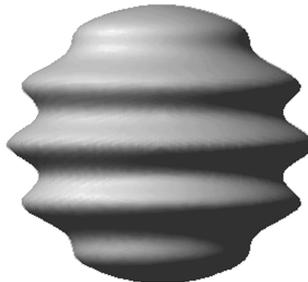


figure 17.5: Sphere with +20% Waves Applied

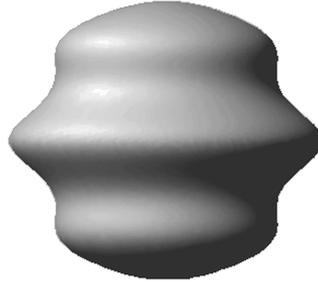
Tsunami

figure 17.6: Sphere with +20% Tsunami Applied

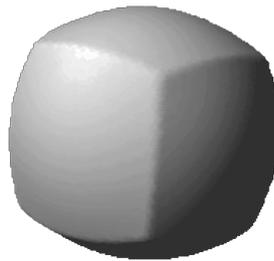
Equalize

figure 17.7: Cube with +75% Equalize Applied

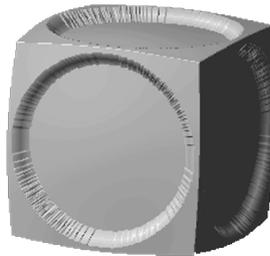
Contrast

figure 17.8: Cube with +25% Contrast Applied

Bottle

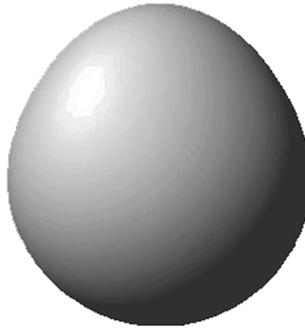


figure 17.9: Sphere with +20% Bottle Applied

Bulge

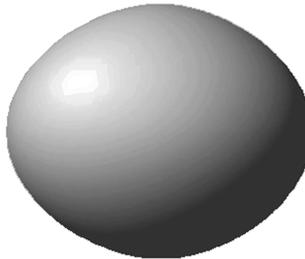


figure 17.10: Sphere with +20% Bulge Applied

Button

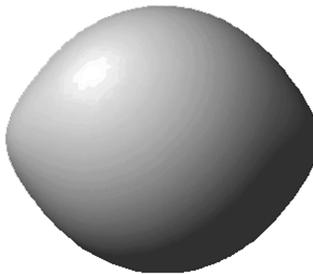


figure 17.11: Sphere with +20% Button Applied (Right View)

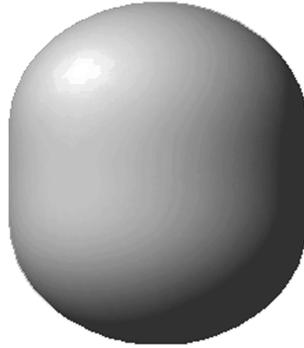
Belly

figure 17.12: Sphere with +20% Belly Applied

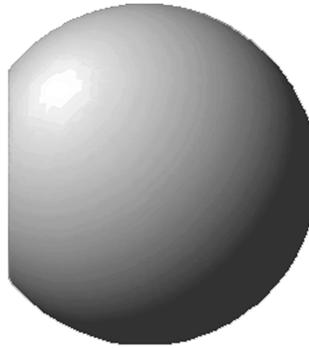
Flatten

figure 17.13: Sphere with +20% Flatten Applied (Right View)

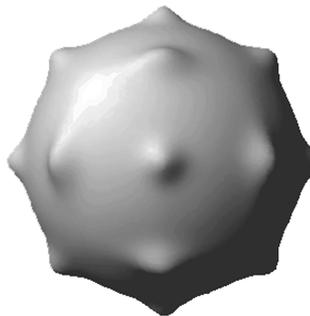
Spikes

figure 17.14: Sphere with +20% Spikes Applied

Shear

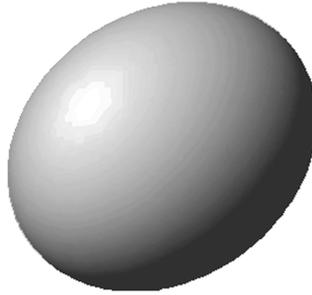


figure 17.15: Sphere with +20% Shear Applied

Bend

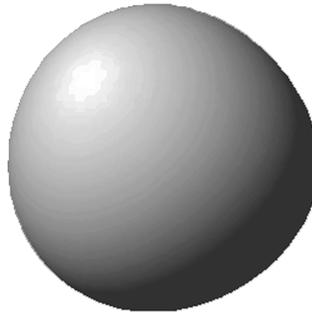


figure 17.16: Sphere with +20% Bend Applied

Radial Shear

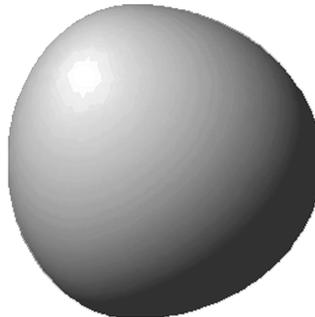


figure 17.17: Sphere with +20% Radial Shear Applied

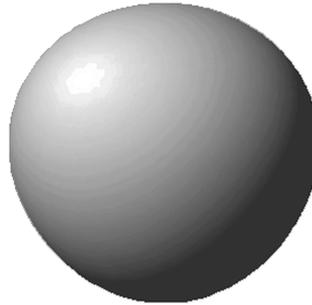
Taper

figure 17.18: Sphere with +20% Taper Applied

Twist

figure 17.19: Cube with +25% Twist Applied

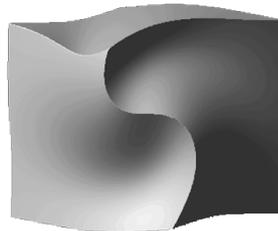
Twirl

figure 17.20: Cube with +50% Twirl Applied

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Chapter 18: Project Menu

18.1 Introduction

The Project menu (*figure 18.1*) contains the basic commands for saving and loading project files, and importing and exporting 3D models, and setting Amorphium's Preferences.

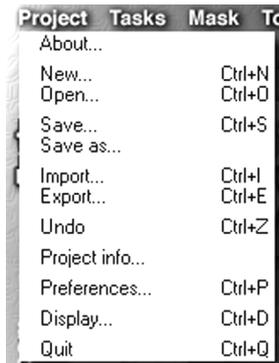


figure 18.1: The Project Menu

18.2 About

About brings up a box (*figure 18.2*) that tells you about Amorphium and its creators.



figure 18.2: Amorphium's About Box

18.3 New

New creates a new Amorphium project.

What is a Project?

An project contains information about all the objects you have created in or loaded into Amorphium, their textures and optic properties, and composer information. For those familiar with 3D modeling & animation, an Amorphium project can be thought of as a **scene file**.

Important!

Before you select **New**, be sure to save the current project if you want to keep any work you have done.

18.4 Open

Open loads an existing Amorphium project..

18.5 Save

Save saves the current project.

Project Contents

When you save a project, Amorphium creates a **Project** folder. In that folder, is the actual project file and two other folders, **Objects** which contains all the objects in the project, and **Textures** which contains any background pictures and textures that you have applied to the objects.

When you save a project, you will be asked to provide names for any models created in Amorphium that are currently called **Untitled**. A project file will be written out and any models created in Amorphium will be saved as separate 3D files in Amorphium's native 3D format, **CMF**. The project files on the PC have the suffix, **.CMA**

18.6 Save As

Save As lets you save a project with a different name. For example, if you have a project called **Cheese** that you modify, you might use **Save As** to save the new project as **Cheese 2**, thus preserving the original **Cheese**, in case you need to go back to it.

18.7 Import

Import allows you to bring in a 3D model created in another 3D program for use in Amorphium. Amorphium can import objects created in any of the following formats:

- **FACT** ElectricImage
- **LWO** Lightwave
- **DXF** AutoDesk
- **3DS** 3D Studio
- **OBJ** Wavefront

Once you have selected an object, you will see the **Import MeshMan** panel (figure 18.3).

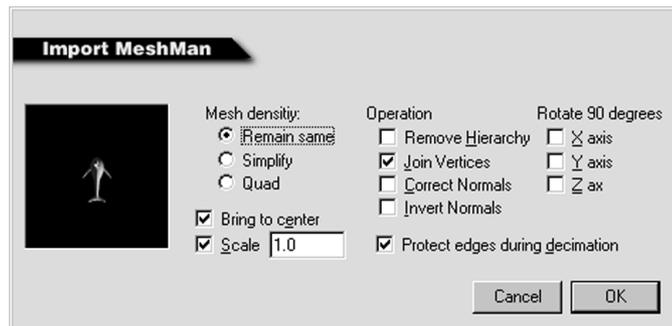


figure 18.3: The Import MeshMan Panel

Mesh Density

- | | |
|-----------------|---|
| Remain | Leaves the mesh density undisturbed so that you can just use the Operations or Rotate Around Axis features. |
| Simplify | Selecting this option will cause MeshMan to reduce the number of polygons in the object by a factor of four. This will create a rougher object. |
| Quad | Selecting this option will increase the number of polygons by a factor of four, making for a smoother object. |
| Bring to Center | Centers the imported object in the 3D workspace. |

Scale Scale can be used to make the object larger or smaller if it comes in a size much too small or large for the 3D workspace.

Operation

Remove Hierarchy Creates a single object from any object with inherent heirarchy. You should leave this option checked for most objects.

Join Vertices This option knits together the vertices of the model. Use it if the model breaks apart when you morph it, or apply brush tools.

Correct Normals The Correct Normals option should be used on imported objects if parts of them shade black.

Invert Normals Use the **Invert Normals** option on models that you have imported into Amorphium if these models won't shade at all.

Rotate Around Axis These options apply 90 degrees of rotation to the object along the axes you select: x, y or z.

18.8 Export

Selecting Export opens the **Export Object** panel (figure 18.4).

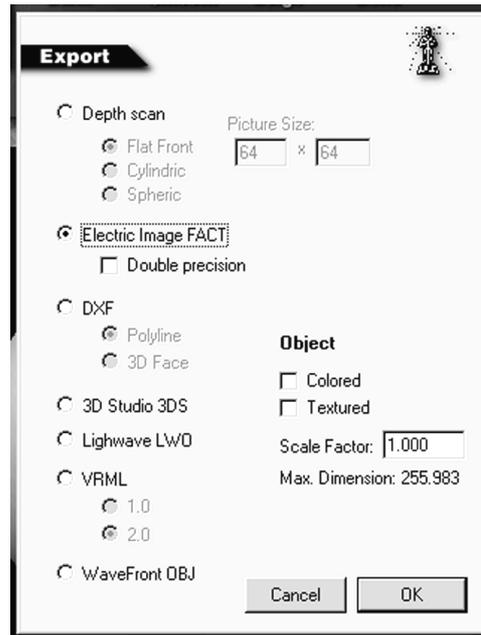


figure 18.4: The Export Object Panel

Amorphium will export objects in any of the following formats:

- Depth Scan** Depth Scan exports a black-and-white image of the object as it appears from the **Front** view of the 3D workspace, rather than an actual 3D object. This is very useful for constructing images for Height Mapping. You can save the image in any of the image formats Amorphium supports.
- Flat Front** Use this option if you plan to use the Depth Scan as a map on a flat object.
- Cylindric** Select this option if you want to use the Depth Scan as a map for a roughly cylindrical object.
- Spheric** Select this option if you want to use the Depth Scan as a map for a roughly spherical object.

Picture Size	This determines the size of the saved images in pixels. The first number is the width of the image, and the second is the height.
Electric Image FACT	Selecting this item will cause Amorphium to save the object in the FACT format for use in Electric Image.
DXF	Selecting this item will cause Amorphium to save the object in the DXF format for use in AutoCad.
3D Studio 3DS	Selecting this item will cause Amorphium to save the object in the 3DS format for use in 3D Studio.
Lightwave	Selecting this item will cause Amorphium to save the object in the LWO format for use in LightWave 3D.
VRML	Selecting this item will cause Amorphium to save the object in a format for use in internet-based 3D applications.
Wavefront OBJ	Selecting this item will cause Amorphium to save the object in the OBJ format for use in Wavefront.
Object	These settings give you more control over the exported object. All options are not available for each object format—unavailable options will appear ghosted-out.
Colored	Color information—any painting you have done on surface of the object is exported with the object. This option is only available for objects exported to the Electric Image FACT or VRML formats.
Textured	Selecting this option means that textures and texture placement and deformation information is exported with the object. This option is only available for objects exported to the Electric Image FACT or VRML formats.
Scale Factor	This number determines the scale (size) of the exported object. 1.000, the default value exports the object with no scaling. A value of 2.000 means the object will be exported double size, and a value of 0.500 exports the object at half size.

18.9 Undo (Ctrl+z) PC; (Apple Key+z)

Undo completely removes the effect of the last operation. Amorphium also gives you an interactive Undo, which allows you to partially undo the last command (*Chapter 13, section 2*).

18.10 Project Info

Selecting Project Info opens the **Project Info** panel (*figure 18.5*).

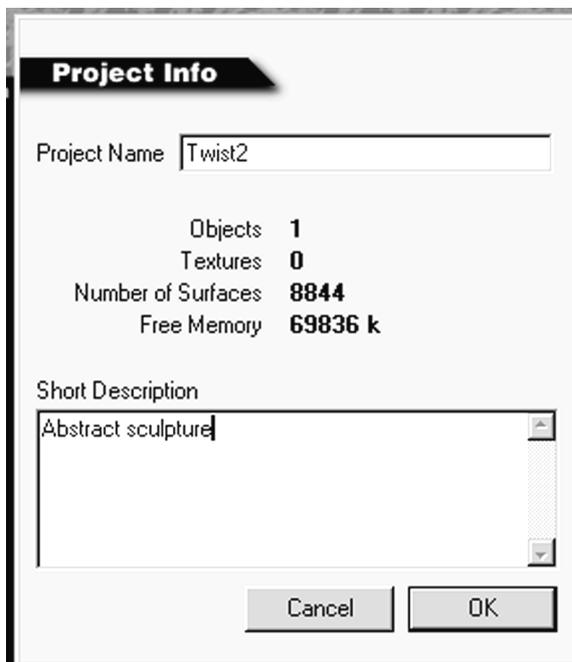


figure 18.5: The Project Info Panel

Here you will find basic information about the project including: number of vertices, polygons, and textures. You can change or specify the project name and store comments about the project.

18.11 Preferences

Choosing this menu item opens the Preferences panel (*figure 18.6*) where you can set basic default operating conditions for Amorphium.

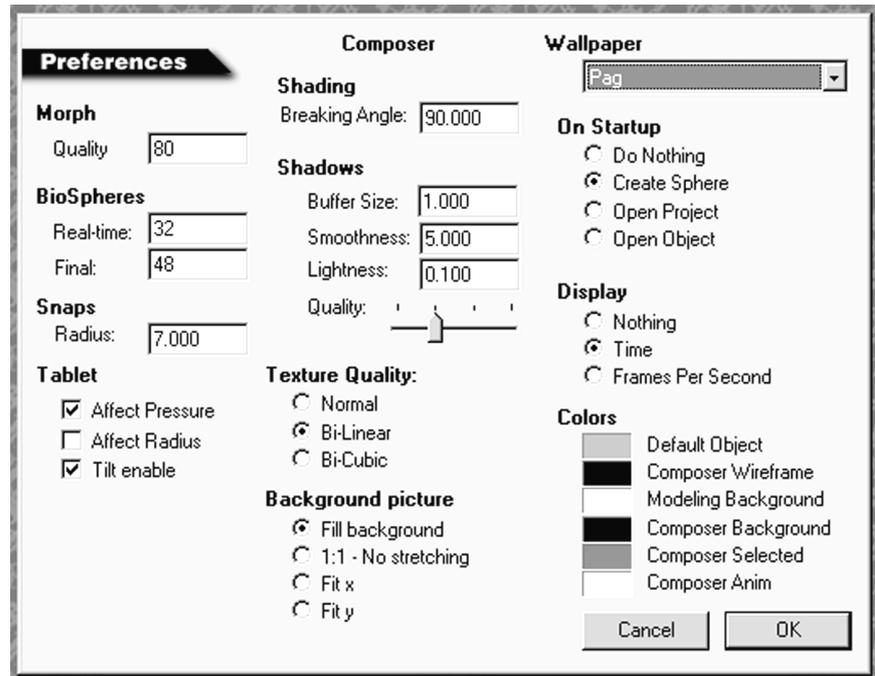


figure 18.6: The Preferences Panel

Morph Sets the quality of the ShapeMorph feature. Higher numbers mean more quality but less interactivity.

BioSpheres

Real Time Sets the resolution (complexity) of the metaballs drawn in the interface. Larger numbers create smoother metaballs but may slow down the interface.

Final Sets the resolution of the metaballs drawn in the rendered images/animations. Larger numbers give better looking images, but may cause longer rendering time.

Snaps Sets the radius (in pixels) around snap point that Amorphium uses to decide that the snap is active.

Tablet	Although it is certainly not required, some people may prefer to control Amorphium with a graphics tablet and pen rather than the mouse. These Tablet Preferences allow you to specify how the graphics tablet will respond in Amorphium.
Affect Pressure	Determines whether Amorphium uses a graphics tablet's (if you are using one) pressure sensitivity to affect the amount of push or pull in Tools&Distorts mode.
Affect Radius	Determines whether Amorphium uses a graphics tablet's (if you are using one) pressure sensitivity to affect the radius of the brush.
Tilt Enable	Determines whether Amorphium uses the tablet's pen tilt sensing abilities to change the tilt setting in Amorphium.
Shading	When a Vertex (the place where two or more polygons meet) Normal differs from the Surface Normal by the amount shown in the Breaking Angle box, then the Face Normal is used for shading that vertex.
Shadows	The Shadows Preferences control how Amorphium deals with shadows in pictures you render from Composer.
Buffer Size	Controls the amount of memory allocated for the shadow. If you decide to render at large resolutions (>2000 across) you may have to increase this value to maintain smooth shadows.
Smoothness	You can adjust this number if the edges of your shadows appear to be rough (aliased). Larger numbers will smooth out the edges of the shadows.
Lightness	The shadow can appear light or dark. The greater this number (up to 1.000), the lighter the shadows will be.
Quality	Lets you trade off the continuity of the shadow with the time it takes to render it. Setting the slider to Max will give smoother, more continuous shadows but will take longer to render than Min .
Texture Quality	Texture Quality gives you ability to control how any textures you have applied to an object will appear when you render the object.
Normal	This option provides for the fastest rendering, but individual pixels in the texture may be visible.

Bi-Linear	Blends the colors of the two neighboring pixels in the texture. This softens the look of the texture map.
Bi-Cubic	Performs spline smoothing of the texture. Looks better than Bi-Linear but takes longer to render.
Background	Controls how the background image (if you are using one) will appear when rendered.
Fill Background	Stretches the background image in the X and Y directions to completely fit the background.
1:1-No Stretching	Places the background image in the center of the background. If the background image is larger than the rendered image size, only the centermost portions are visible. If smaller than the rendered image size, black will appear around it.
Fit X	Stretches the background image horizontally to fill the background.
Fit Y	Stretches the background image vertically to fill the background.
Wallpaper	Wallpaper refers to the pattern drawn in the portion of the interface between the 3D workspace and the surrounding tools. Amorphium gives you six patterns to choose from: Gray , Cro , FlowerPower , Amorphium , BeautifulHead and Pag .
On Start-Up Do	These Preferences allow you to set Amorphium's behavior each time you start the program.
Nothing	Amorphium will open normally, but will not load an object into the 3D workspace.
Create Sphere	Each time you open Amorphium, a sphere will automatically be created in the 3D workspace. This is the default setting.
Open Object	When Amorphium is started, it will automatically show the Open Object window, from which you can select an Amorphium format object to load into the 3D workspace.
Open Project	When Amorphium is started, it will automatically show the Open Project window, from which you can select a project you want to work with.

Colors	The Colors Preferences set the default colors of various things you will work with in Amorphium. The current color for each setting is displayed next to that setting. To change one of the colors, click on it. This will open up a color palette from which you can choose the new color.
Default Object Color	Sets the color of objects when initially created or imported.
Modeling Background Color	Sets the color of the 3D workspace.
Composer Background Color	Sets the color of the background of the Composer workspace.
Composer Wireframe Color	Sets the color used to draw the object's wireframe in the Composer workspace.
Composer Selected Color	Sets the color of the currently selected object in the Composer workspace.
Composer Anim Object Color	Sets the color of the object in the Composer workspace that is being animated.
Display	Display enables you to display a counter in the upper right hand corner of the Amorphium screen.
Current Time	Uses the clock in your computer to display the time of day.
Nothing	Turns off the display.
Frames Per Second	The display speed, in frames per second, of the drawing engine currently in use.

18.12 Display

At some point, you may find it useful view an image (perhaps for a texture or a Height map) at its full resolution. Display gives you that ability. Selecting Display opens a window which allows you to select any image on your hard drive, and display it at its full size. To close the image and return to the Amorphium screen, just click the mouse button.

18.13 Quit

Quit closes Amorphium. Amorphium will remind you of any unsaved changes in your work, and give you a chance to save them before shutting down.

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Chapter 19: Tasks

19.1 Introduction

Clicking on the **Tasks** button at the top of the Amorphium screen displays the Tasks tools (*figure 19.1*).



figure 19.1: The Tasks Tools

Tasks provides you with a method for recording each step that you take in Amorphium while you are creating an object. When you turn it on, Amorphium keeps track of all the steps you take on the object in the 3D view: The brush strokes, painting, texture modification, distorts, etc. Each step will be displayed in the task list (on the right hand side of the interface).

19.2 Task List

The Task List (*figure 19.2*) contains all the individual operations that together make up the script.



figure 19.2: The Task List

The steps in the task list are recorded in chronological order, with the most recent steps appearing at the bottom of the list. When there are more steps than can be displayed in the Task List at one time, you can use the scroll bar to the right of the Task List to reveal the other steps.

To select an individual step, move the pointer over it and click the mouse button. The step will be highlighted indicating that it is selected.

19.3 File

The File tools (*figure 19.3*) allow you to save and open tasks on your computer hard drive. Amorphium tasks have the file extension `.tsks`.

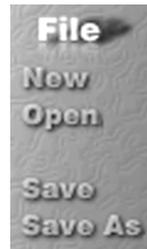


figure 19.3: The File Tools

- New** Click **New** button to create a new task. When you begin a new task, the task list will appear blank, and each individual step will appear as you work.
- Open** Click the **Open** button to load an existing task from your computer hard drive into the **Task List**. Once the task is opened, you can use any of the **Replay** tools to play it back.
- Save** Click the **Save** button to save the contents of the **Task List** as a task. A **Save File** window will appear over the Amorphium screen, from which you can select a folder on the hard drive and a name for the saved task.
- Save As** Select **Save As** to save a task under a different name or to a different location on the computer's hard drive.

19.4 Record

This group of tools (*figure 19.4*) allow you to create a task by beginning, pausing and ending the recording of individual tasks.



figure 19.4: The Record Tools

Record Indicator

Pressing **Record** causes Amorphium to begin keeping track of everything you do to an object in the 3D workspace.

While you are recording, you will see steps added to the **Task List**, and you will also see a red line under the **Tasks** button (*figure 19.5*) to indicate that recording is active.

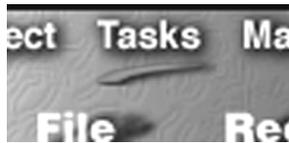


figure 19.5: The Record Indicator

Pause Any steps you take while Pause is on will not be added to the **Task List**. Click **Pause** again when you are ready to begin recording again. When you click **Pause** the red line which indicates recording is on (*figure 19.5*) will appear dimmer, indicating that steps are not being recorded.

Stop Clicking the **Stop** button turns off task recording. Any steps already in the **Task List** will remain unless you create a new Task, or open an existing one. You can resume recording at anytime and new steps will be added after the previous ones.

19.5 Replay

The **Replay** tools (*figure 19.6*) provide you with options when you play back a script.



figure 19.6: The Replay Tools

All Steps Selecting **All Steps** will cause Amorphium to replay every step in the Task List in chronological order.

To This Step To use this option, select the step in the task list that you wish to be the **last step performed**. Then click **To This Step** to replay until it reaches that step.

From This Step To use this option, select the step in the task list that you wish to be the **first step performed**. Then click **From This Step** to replay the task from that step until it reaches the end or you click **Stop**.

Only This Step To use this option, select the step in the task list that you wish to replay, then **Only This Step**. The step you have selected will be performed.

19.6 Replay Intensity

The **Replay Intensity** tool (*figure 19.7*) sets the strength of each step.



figure 19.7: The Replay Intensity Tool

Default is 100%, but you can put your cursor over the shaded ball, hold down the mouse button and drag to set a lower intensity.

19.7 Edit Task Step

When you click the **Edit Step...** button, the **Edit Task Step** panel (*figure 19.8*) appears.

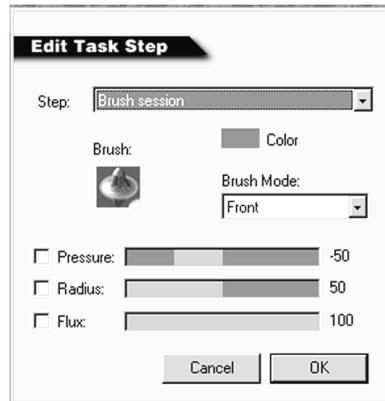


figure 19.8: The Edit Task Step Panel

Amorphium allows you to edit individual steps in a tasks—this is accomplished from **Edit Task Step** Panel.

In this panel you can change which **Brush** was used, the color of the brush (for painting), the value of **Pressure**, **Radius** and **Flux** (click on the respective checkbox to enable the change), the **Brush Mode**, and the type of step.

Delete Step

An individual step can be deleted from a task by selecting the step in the **Task List** and then clicking **Delete Step**.



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Chapter 20: Masks

20.1 Introduction

Clicking on the **Mask** button at the top of the Amorphium screen displays the Mask tools (*figure 20.1*).



figure 20.1: The Mask Tools

Masking can be a great time-saver. The way a mask works is by allowing you to select a very specific area of an object to work with, and to protect all other areas from any operations you may perform.

You can apply as many masks as you like to an object, and add masks to it at any time you wish. For example, you might apply one mask to protect a portion of the object while you sculpt the rest; later on, you might paint a different part of the object and then protect it with a different mask while you apply a texture everywhere else on the object. The possibilities are endless.

Important Note!

If you find that an object is behaving strangely when you try to use Amorphium's other tools on it, you should open the **Mask** tools to check to see if you have forgotten to turn off a mask you might have been working with.

Mask Colors

When you open the **Mask** tools, the object in the 3D workspace will appear in white. When masking, **White** indicates areas of the object that have not been masked, while **Red** indicates areas that have been masked.

Areas of an object that are masked will not be affected by Amorphium's tools. If you paint a large red circle on the middle of a sphere, for example, and then open the **Paint&Optics** tools (*Chapter 23*), you will not be able to apply paint to that part of the object, no matter how you try.

20.2 Mask/Unmask All

These tools (*figure 20.2*) provide global mask operations.



figure 20.2: The Mask/Unmask All Buttons

Mask All Mask All protects the entire object at once—it functions like the **Paint Bucket** (*Chapter 23, section 1*). **Mask Bucket?** When you apply **Mask All**, the object in the 3D workspace becomes completely red no tools will affect the object.

Unmask All Unmask All reverses the effect of **Mask All**—the object in the 3D workspace becomes entirely white, and all tools will affect it as normal.

20.3 Mask/Unmask Shapes

The Mask/Unmask shapes (*figure 20.3*) allow you to choose the area of the object that you wish to work on or protect.

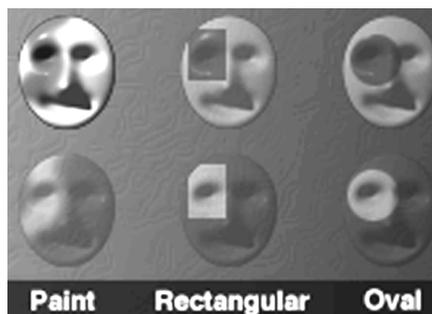


figure 20.3: The Mask/Unmask Shapes Buttons

Paint **Paint Mask** lets you use any of Amorphium's **Brushes** (*Chapter 16, section 3*) to manually paint a mask on an object. The areas you mask will appear red. The **Brush Modifiers** (*Chapter 16, section 4*) behave as normal when you create a mask with **Paint Mask**.

Paint Unmask does just the opposite—it removes the mask from an object using the selected brush. The parts of the object from which you remove the mask will turn from red to white.

Rectangular **Rectangle Mask** lets you drag a rectangle over the object to create a Mask. Everything under the rectangle will be masked and turn red.

Rectangle Unmask un.masks any masked region of the object under a rectangle you drag out.

Oval **Oval Mask** lets you drag an oval over the object to create the mask. Everything under that oval will be masked and turn red.

Oval Unmask un.masks any masked region of the object under the oval you drag out.

20.4 Invert/Smooth

The **Invert** and **Smooth Mask** tools (*figure 20.4*) allow you to alter any masks currently applied to the object.



figure 20.4: The Invert and Smooth Mask Tools

Invert Invert Mask reverses the mask so that all areas of the object which are masked (red) become unmasked (white), and all unmasked areas become masked.

Smooth Smooth softens the transition at the borders of the masked and unmasked regions.

20.5 Displace

The **Displace Mask** tools (*figure 20.5*), allow you to move the unmasked parts of the object with respect to the masked parts.



figure 20.5: The Displace Mask Tools

These tools function like the **Move&Zoom** tools (*Chapter 15, section 1*), allowing you to move the unmasked areas of the object in the x and y axes (left-right, up-down) and the z axis (in-out)

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Chapter 21: Height Shop

21.1 Introduction

Clicking on the HeightShop button at the top of the Amorphium screen displays the HeightShop tools (*figure 21.1*).



figure 21.1: The Height Shop Tools

The purpose of Height Shop is to enable you to emboss your Amorphium objects using a two-dimensional image. Height Shop can be a fantastic way to create amazingly sophisticated objects in a matter of mere seconds.

21.2 Current HeightShop Image

The **Current HeightShop Image** (*figure 21.2*) is the image that will be used for the Height Shop map.



figure 21.2: The Current Height Shop Image

If no image has been loaded the **Current HeightShop Image** appears solid black.

Only the luminance (brightness) information is used for the Height Shop Map, so the **Current Height Shop Image** always appears in black-and-white.

Open Use the **Open** button to select an image from your computer's hard disk to use for the Height Shop map.

Remove Remove clears the **Current HeightShop Image**, which will become solid black until another image is loaded.

21.3 Mapping Options

The **Mapping** options (*figure 21.3*) allow you to determine how the image will be applied to the object.



figure 21.3: The Mapping Options

Rectangular Select the **Rectangular Mapping** option when the shape of the object to which the HeightShop map will be applied is closest in shape to a cube.

Cylindrical Select the **Cylindrical Mapping** option when the shape of the object to which the HeightShop will be applied is closest in shape to a cylinder.

Spherical Select the **Spherical Mapping** option when the shape of the object to which the HeightShop will be applied is closest in shape to a sphere.

21.4 Channels

The **Channels Options** (figure 21.4), allow you to determine which parts of the image will be used when the Height Map is applied.

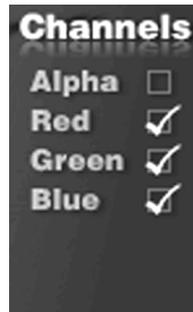


figure 21.4: The HeightShop Channels

Any image color image can be separated into separate channels. In other words, for each pixel in the image there will be a Red, Green, Blue and (sometimes) Alpha value that will determine that pixel's overall appearance within the image. Amorphium allows you to apply the channels of an image individually or in groups of two or more.

- Alpha** Selecting **Alpha** applies transparency information from the image to the Height Map. In other words, alpha information can make parts of the HeightShop map transparent as it applied to an object.
- Red** Selecting **Red** means that the information in the red channel of the Height Shop Image will be used when the Height Shop is applied to the object.
- Green** Selecting **Green** means that the information in the green channel of the Height Shop Image will be used when the Height Shop is applied to the object.
- Blue** Selecting **Blue** means that the information in the blue channel of the Height Shop Image will be used when the Height Shop is applied to the object.

21.5 FX

The FX controls (*figure 21.5*) allow you to make adjustments to the **Current HeightShop Image** before it is applied to the object in the 3D workspace.



figure 21.5: The Height Shop FX Options

The FX controls are used by moving the pointer over the desired control, clicking and holding the mouse button and dragging the mouse left and right.

Brightness

The **Brightness** button allows you to make the texture map lighter or darker in color. The range of **Brightness** values is **-100%** to **+100%**.

Contrast

The **Contrast** button sets the ratio of bright to dark in the image. It can help bring out extra details in dark images. The range of **Contrast** values is **0%** to **+100%**.

21.6 Apply

The **Apply** button (*figure 21.6*) is used to interactively apply the **Current HeightShop Image** to the object in the 3D workspace.



figure 21.6: The Apply Button

To use it, move the pointer over the button—the pointer will turn into a left-right arrow. Then click and drag the mouse left or right.

The HeightShop map can be applied from a range of **-100%** to **+100%**. With negative values, the object becomes smaller, and with positive values, it becomes larger.

**Important
Note!**

If you release the mouse button and then click it again, you will be applying the Height Map for a second time, not continuing the original application.

21.7 Adding a Height Shop Map

To apply a HeightShop Map to an object.

The first step is to select an image to use for the Height Shop Map.

- Click on the **Open** button beside the **Current Height Shop Image** (*figure 21.2*).

The next step is to decide which of the four channels in the image to use.

- From the **Channels** tools (*figure 21.4*) select any or all of the **Alpha**, **Red**, **Green** and **Blue** Channels to use for the Height Shop Map.

Next, make any necessary adjustments to the image.

- Use the **FX** controls (*figure 21.5*) to adjust the **Brightness** and/or **Contrast** of the image.

At this point, you are ready to apply the map to the object—to do this you have two choices:

- Click the **Apply** button and drag the mouse left or right—this will apply the **Current Height Shop Image** to the entire object interactively.

The other choice is to

- Select a **Brush** (*Chapter 16, section 3*) and paint the image onto the surface of the Object.

As you brush over the surface, the image will be brought out in 3D.

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Chapter 22: Morph

22.1 Introduction

Clicking on the **Morph** button at the top of the Amorphium screen displays the Morph tools (*figure 22.1*).



figure 22.1: The Morph Tools

Morphing is a wonderful feature that essentially lets you turn one object into another, and lets you make an animation out of the change. In fact, Amorphium allows you to interactively morph between three different objects: the objects in the left and right morph windows, and the object in the 3D workspace can all act as **Morph Targets**.

22.2 Morph Modes: Basic & Shape Morphing

The Morph tools function in one of two different ways—depending on the objects you are working with—**Basic Morphing** and **Shape Morphing**.

Basic Morphing

Basic Morphing takes place when the targets have the same number of polygons and vertices. All of the **Organic** objects (*Chapter 14, section 2*) meet this criteria.

Basic Morphing also works when you work with objects derived from the same original object. For example, you could load in an object, make a copy of it, and then use the **Brush** (*Chapter 16*) or **Distort** (*Chapter 17*) tools on it. You then can use Basic Morphing between the original object and the copy.

**Shape
Morphing**

Shape Morphing occurs when the targets have a different number of polygons and/or vertices. Amorphium attempts to build a mapping between the vertices of one object and the vertices of the other. When Shape Morphing begins there will be a slight delay as Amorphium builds this mapping. Once the mapping is complete, you can interactively morph as with **Basic Morphing**.

22.3 Morph Windows

The **Morph Windows** (figure 22.2) are where you load objects to be used as **Morph Targets**.



figure 22.2: A Morph Window

There is a **Left Morph Window** and a **Right Morph Window**—between them you will find the **Morph Target Controls**.

**Loading an
Object**

To load an object into a **Morph Window**, click on the **Choose** button above it. A pop-up menu will appear with a list of objects. Highlight the object you want, and release the mouse button. The **Morph Windows** can be cleared by clicking the **Remove** button over the appropriate window.

22.4 Morph Optics

The **Morph Optics** option (*figure 22.3*) is a checkbox appearing over the **Morph Target Controls**.



figure 22.3: The Morph Optics Option

Select the option by clicking on the box so that a checkmark appears.

Turning **Morph Optics** on tells Amorphium to morph the surface attributes of the object as well as the shape as you drag the **Morph Target Controls**.

This means that you have the option of having any paint or texture information being transferred to while you morph.

22.5 Morph Target Controls

To perform the actual morph, you will use the **Morph Target Controls** (*figure 22.4*).

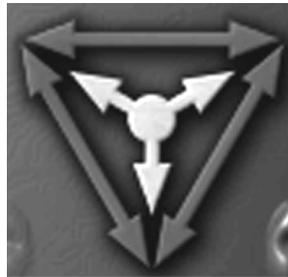


figure 22.4: The Morph Target Controls

There are actually four different **Morph Target Controls**, whose functions are detailed below. Each is used the same way—move the pointer over the desired control; it will turn into a two- or four-headed arrow. Click and drag the mouse button in the directions indicated by those arrows to interactively perform the morph.

- Left-Right** The Left-Right Morph Target Control (the top side of the triangle) morphs between the objects in the Left and Right Morph Windows. The results appear in the 3D workspace.
- Left-Work-space** The Left-Workspace Morph Target Control (the left side of the triangle) morphs between the objects in the Left Morph Window and the 3D workspace. The results appear in the 3D workspace.
- Right-Work-space** The Right-Workspace Morph Target Control (the right side of the triangle) morphs between the objects in the Right Morph Window and the 3D workspace. The morphed object appears in the 3D workspace.
- Left-Right-Workspace** The Left-Right-Workspace Morph Target Control (the three pointed arrow inside the triangle) morphs between the objects in the Left Morph Window, Right Morph Window and the 3D workspace, allowing you to combine all three into a new object which you will see changing in the 3D workspace as you drag the control.

22.6 Morph Fusion

Morph Fusion is a feature which allows you to emboss the shape of the object in one of the **Morph Windows** onto the object in the **3D workspace**. Click on one of the small faces next to the **Left** or **Right Morph Windows** (*figure 22.5*) to select which one to use for **Morph Fusion**.

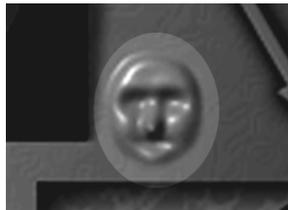


figure 22.5: Morph Fusion Switch

Then just select one of the **Brushes** (*Chapter 16, section 3*) and click and drag on the object in the **3D workspace**.

22.7 Sample Morph

Here is a sample morph that will quickly get you up to speed with the Controls.

Begin with a new project, so that a default Sphere is loaded into the 3D workspace, then:

- Click the **Choose** button over the **Left Morph Window**, and select **Cylinder** from the menu which appears.

You should now see a **Cylinder** in the **Left Morph Window**.

- Click the **Choose** button over the **Right Morph Window**, and select **Tetrahedron** from the menu which appears.

At this point you should see a **Sphere** in the **3D workspace**, a **Cylinder** in the **Left Morph Window**, and a **Tetrahedron** in the **Right Morph Window**.

Move your pointer over the **Left-Right-Workspace Morph Target Control** (figure 22.6) so that it is highlighted, and the pointer turns into a four-headed arrow.

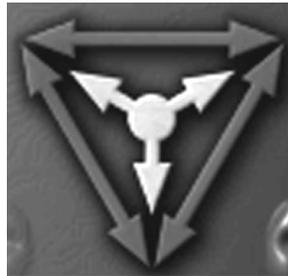


figure 22.6: The Left-Right-Center Morph Target Control Highlighted

- Click and hold the mouse button, then drag the mouse to morph between the three shapes.

The object in the 3D workspace will interactively change from a sphere to a cylinder to a tetrahedron and back.

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Chapter 23: Paint&Optics

23.1 Introduction

Clicking on the **Paint&Optics** button at the top of the Amorphium screen displays the Paint&Optics tools (*figure 23.1*).

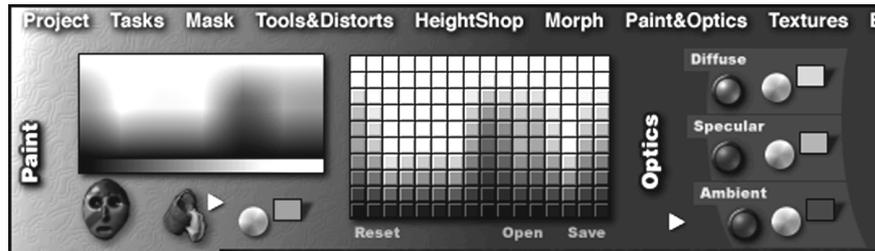


figure 23.1: The Paint & Optics Tools

These tools allow you to paint your objects and to change the way they react to light.

23.2 Paint Tools

These are the tools you will use when you want to paint an object. You will be able to make the object paintable, and pick colors and even add several special Paint FX. The paint tools work with the **Brushes** (*Chapter 16, section 3*) and **Brush Modifiers** (*Chapter 16, section 4*).

Palette The **Palette** (*figure 23.2*) allows you to set the **Current Paint Color**.

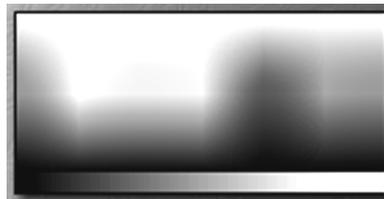


figure 23.2: The Palette

As your pointer passes over the Palette, it will change to an eyedropper. Now if you click and hold the mouse button, and drag the mouse over the Palette, the **Current Paint Color** will change correspondingly. Just release the mouse button when you see the color you want.

Color Swatch

The Color Swatch (*figure 23.3*) is useful for conveniently store frequently used colors.

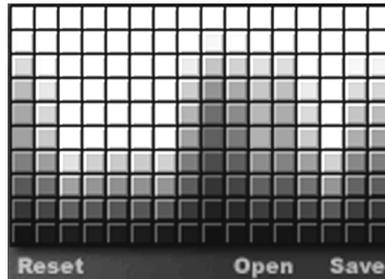


figure 23.3: The Color Swatch

There are 160 individual boxes in the Color Swatch, each of which can contain a different color. To copy a color from the **Color Swatch** to the **Current Paint Color**, move the pointer over the desired color, and click the mouse button.

Copying a Color

To copy the **Current Paint Color** to the **Color Swatch**, move your pointer over the a box you want to change, hold down the **Alt** key (**Option** on the Mac), and click the mouse button.

Changing the Swatch

The **Color Swatch** can be saved, to disk or loaded from disk using the **Save** and **Open** buttons under the Swatch. The Swatch can be reset to its default colors using the **Reset** button. The Swatch file extension is **.COL**.

Paint Object Switch

The multi-colored mask (*figure 23.4*) is the Paint Object Switch.



figure 23.4: The Paint Object Switch

Click this switch to enable painting for the object in the 3D workspace.

Current Color

The Current Paint Color (*figure 23.5*), is set with the **Palette**, the **Color Swatch**, or the **Color Wheel** next to it.

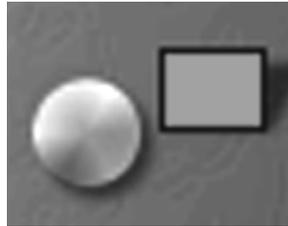


figure 23.5: The Current Paint Color and Color Wheel

Setting the Current Paint Color

Clicking and holding on the **Current Paint Color** will bring up a copy of the **Palette**, and pointer changes to an eyedropper. You can select a color from the **Palette** or move the eyedropper into the 3D workspace to pick a color directly from the object's surface. The **Current Paint Color** will change color as you drag over the object. Release the mouse button when the **Current Paint Color** indicates the color you want.

Paint Bucket

The **Paint Bucket** (*figure 23.6*) is used to paint the entire object at once, rather than with one of the brushes.

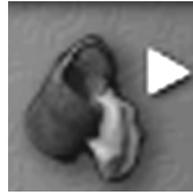


figure 23.6: The Paint Bucket

The object in the 3D workspace will be painted with the **Current Paint Color**.

Paint FX Menu

The white triangle next to the **Paint Bucket** (*figure 23.6*) gives you access to the **Paint FX** pop-up menu (*figure 23.7*).



figure 23.7: The Paint FX Pop-up Menu

The **Paint FX** create nice organic effects like **Marble** and **Veins** by combining the **Current Paint Color** with whatever color is already on the object. **Noise**

23.3 Optics Tools

The **Optics** tools (*figure 23.8*) allow you to control how an object responds to the light in a scene.



figure 23.8: The Optics Tools

Diffuse Diffuse controls the response your object has to light. Clicking the mouse button while the pointer is over the **Diffuse Level** button (the green sphere under the word **Diffuse**), and dragging left and right will increase or decrease an object's overall response to the light in the scene.

Changing
Diffuse Color

The **Current Diffuse Color** appears to the right of the **Color Wheel**. Clicking on the **Color Wheel** next to the **Diffuse Level** control will open the System Palette for your computer, or clicking directly on the **Current Diffuse Color** will open a pop-up Palette. Use either Palette to set the underlying color of your object.

Specular Specular controls the highlight on your object. Clicking the mouse button while the pointer is over the **Specular Level** button (the green sphere under the word **Specular**), and dragging left and right will increase or decrease the specular highlights of an object.

Changing
Specular Color

The **Current Specular Color** appears to the right of the **Color Wheel**. Clicking on the **Color Wheel** next to the **Specular Level** control will open the System Palette for your computer, or clicking directly on the **Current Specular Color** will open a pop-up Palette. Use either Palette to set the color of the highlights on your object.

Ambient Ambient controls the response your object has to the ambient light in the scene. While Amorphium has a single light that you control, there is a bit of extra light, ambient light, that fills the entire environment.

Clicking the mouse button while the pointer is over the **Ambient Level** button (the green sphere under the word **Ambient**), and dragging left and right will increase or decrease the overall level of ambient light in the scene.

Changing Ambient Color

The **Current Ambient Color** appears to the right of the **Color Wheel**. Clicking on the **Color Wheel** next to the **Ambient Level** control will open the System Palette for your computer, or clicking directly on the **Current Ambient Color** will open a pop-up Palette. Use either Palette to set the color of the ambient light in the scene.

23.4 Optics Options Menu

The white triangle under the **Optics Tools** brings up the **Optics Options** pop-up menu (figure 23.9).



figure 23.9: The Optics Options Menu

This menu allows you to control how your objects respond to shadows, and to Save and Load Optics properties.

Object Casts Shadow

When Amorphium renders a scene, you have the ability to specify how the objects in that scene will respond to shadows. The **Object Casts Shadows**

option allows you to determine whether an object will cast shadows onto other objects when it is rendered.

**Object
Receives
Shadow**

The **Object Receives Shadow** option determines whether an object will be affected by shadows cast by other objects in the rendered scene. The **Cast/Receive** options work independently of each other, so both can be on or off, or one on while the other is off.

Open Optics

Loads **Optics** settings (the color and levels of **Ambient**, **Specular**, **Diffuse** and **Cast/Receive Shadow** settings for an object) from a file of type **.CMO** onto the object in the 3D workspace.

Save

Saves out the **Optics** settings of the object in the 3D workspace to a file on your computer hard drive. Amorphium **Optics** files are saved with the **.CMO** extension.

Copy Optics

Copy Optics places the **Optics** settings (the color and levels of the **Ambient**, **Specular**, **Diffuse** and **Cast/Receive Shadow** settings) of the object in the 3D workspace in the internal clipboard of your computer. Very useful when you want to apply the same optics settings to several objects.

Paste Optics

Paste Optics copies any **Optics** settings you may have placed on the computer's clipboard with the **Copy Optics** command onto the object in the 3D workspace, replacing that object's current **Optics** settings .

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Chapter 24: Textures

24.1 Introduction

Clicking on the **Textures** button at the top of the Amorphium screen displays the Textures tools (*figure 24.1*).



figure 24.1: The Textures Tools

Textures are two-dimensional pictures that you can use to change the color of a three-dimensional Amorphium object.

For example, let's think of a good old basic sphere. You could paint it using the **Paint&Optics** tools (*Chapter 23*), or you could apply a texture—which is like taking a photograph and pasting it on the surface of the sphere. Amorphium allows you to add a single texture to the surface of each 3D object.

24.2 Opening a Texture

At the upper left side of the Amorphium screen, you will see a box (*figure 24.2*). This box displays the **Current Texture**. When you start Amorphium, this box appears black, indicating that no texture has been loaded.

To open a texture, click the **Open** button at the bottom of the right side of the **Current Texture** (figure 24.2).



figure 24.2: The Current Texture along with the Open and Remove Buttons

An **Open File** window will appear from which you can select an image to use for your texture. Amorphium will use any of the following image formats as textures:

- Image
- PICT (Macintosh only)
- GIF
- TIFF
- PNG
- BMP (PC only)

Once you have selected an image, it will be applied to the object in the 3D workspace according to the Mapping settings, and appear as the **Current Texture** (figure 24.3).

**Important
Note!**

If the **Drawing Options** aren't set to **Textured Objects**, you won't be able to see any textures on your objects. See *Chapter 14, section 9* for details.

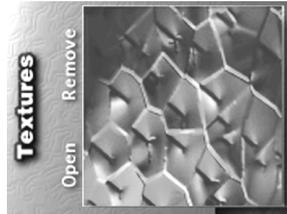


figure 24.3: A Texture Loaded

**Removing a
Texture**

To remove a texture, click the **Remove** button to the left of the **Current Texture**. The texture will be removed from the object in the 3D workspace, and the **Current Texture** will return to black.

**Positioning a
Texture**

To change the position of the texture on the surface of the object interactively, click and drag on the **Current Texture**. As you drag left/right, up/down, the texture's position on the 3D object will update in real-time.

24.3 Texture Mapping Options

Amorphium provides you with several texture **Mapping** options (figure 24.4) which determine how the texture will be applied to your object.



figure 24.4: The Texture Mapping Options

Mapping Buttons

Amorphium provides you with three different ways of applying a texture to an object—**Rectangular**, **Cylindrical** and **Spherical**. These options are chosen from the green buttons on the left side of the Mapping Options (figure 24.5).



figure 24.5: Rectangular, Cylindrical and Spherical Mapping Buttons

- Rectangular** Select the **Rectangular Mapping** option when the shape of the object to which the HeightShop map will be applied is closest in shape to a cube.
- Cylindrical** Select the **Cylindrical Mapping** option when the shape of the object to which the HeightShop will be applied is closest in shape to a cylinder.
- Spherical** Select the **Spherical Mapping** option when the shape of the object to which the HeightShop will be applied is closest in shape to a sphere.
- Mirror** **Mirror** causes the texture to be reflected as if in a mirror when the texture size is smaller than the object size. Copies of the image are right-side-up if this option is turned off.
- Turbulence** **Turbulence** adds noise to the map. To use it, click on the **Turbulence** button and drag to the left or right. The range of values is 0-100%.
- Scale** **Scale** interactively changes the size of the texture with respect to the object. To use it, click on the **Scale** button and drag to the left or right. The range of values is 0-100%. As you scale the texture smaller, multiple copies will appear on the object. This is not the case if an Alpha channel is used to mask part of the map (see Alpha below).
- Paint Texture** **Paint Texture** copies the colors in the texture map to the paint layer of the model. After you have pressed the **Paint Texture** button, remove the texture map. You will then see the paint layer with the colors of the map applied. You can now go into the **Paint&Optics** mode and paint over the map.

Liquifying a Texture

Amorphium offers you one other really cool way to control a texture. Once the texture is applied to an object, you can use any of Amorphium's **Brushes** (*Chapter 16*) to move the texture around as if the texture were turned to liquid on the object's surface.

24.4 Texture Alpha Channel

Amorphium gives you the ability to use an Alpha (transparency) channel when texture mapping. This feature is controlled with the **Alpha** channel options (*figure 24.6*).



figure 24.6: The Alpha Channel Options

Use

Uses the Alpha channel of the image to apply the texture map to the object. This has the effect of making the texture blend with whatever surface characteristics the object already possesses, depending on the actual alpha value of each pixel.

Invert

Invert the values of each pixel of the alpha channel. The most transparent parts of the map become the most opaque, and vice versa.

24.5 Texture FX

You might find yourself needing to adjust some aspect of a texture in order to make it just right, and for just that reason, Amorphium offers you the texture FX controls (*figure 24.6*).



figure 24.6: The Texture FX Controls

These controls are operated by clicking on them and dragging the mouse left and right.

- Opacity** Opacity controls the transparency of the texture on the object. When set to less than 100%, you can see the object's diffuse and Paint colors underneath.
- Lightness** The **Lightness** button allows you to make the texture map lighter or darker in color.
- Contrast** The **Contrast** button sets the ratio of bright to dark in the map. It can help bring out extra details in dark maps.
- Hue Rotate** The **Hue Rotate** button changes the overall colors used. As you drag the mouse you will see the texture cycling through all the colors of the rainbow.
- Saturation** The **Saturation** button sets the overall intensity of the colors in the texture. Low Saturation values mean mostly gray colors, while high values produce more cartoon-like colors.

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Chapter 25: BioSpheres

25.1 Introduction

In addition to Amorphium's sculpting tools, you will find another very different, yet extremely powerful way to create 3D objects—**BioSpheres**. Clicking on the **BioSpheres** button displays the **BioSpheres** tools (*figure 25.1*), and puts Amorphium into BioSpheres mode.

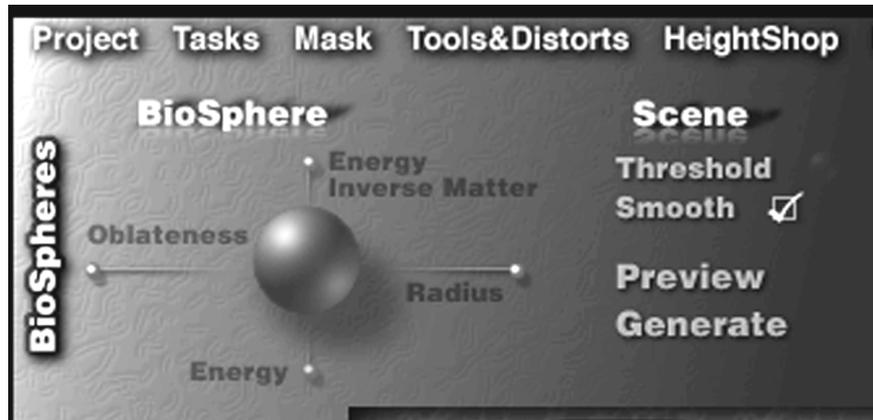


figure 25.1: The BioSpheres Tools

BioSpheres are amazingly flexible tools for creating 3D objects; but what actually are they? Basically, BioSpheres are strange little spheroids with properties that make them perfect for creating 3D objects. The clever part about BioSpheres is how they interact with other BioSpheres. One BioSphere by itself won't make many models, but get a few of them together, and things really start to get interesting. In fact it is possible to make objects using BioSpheres in just a few minutes that would quite literally take hours or even days with traditional 3D modeling programs.

25.2 Adding a BioSphere to the 3D Workspace

The menus below the 3D workspace control BioSpheres instead of objects as they do in Tools&Distorts mode. To add a BioSphere to the 3D workspace:

- Click the **New** button below the 3D workspace. A BioSphere will be added to the 3D workspace (figure 25.2).

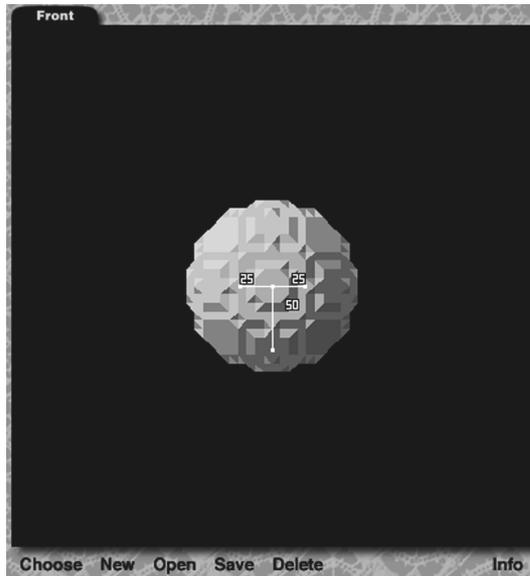


figure 25.2: Adding a BioSphere to the 3D Workspace

25.3 Moving a BioSphere

A BioSphere can be moved around on the 3D workspace in one of two ways:

- Click and hold the mouse button on the **BioSphere Tool** the upper-right part of the screen (figure 25.2) and drag.

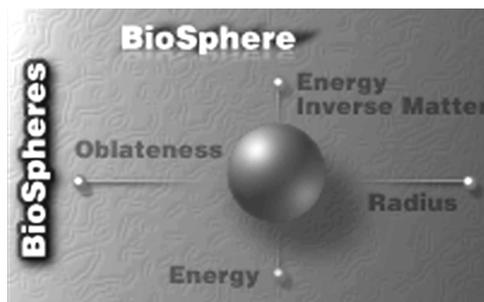


figure 25.2: The BioSpheres Tool

- Or click directly on the BioSphere itself, in the center where the three green lines intersect (*figure 25.3*).

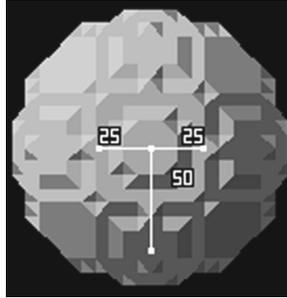


figure 25.3: Close-up of a BioSphere

25.4 Adding a Second BioSphere

Once you have the hang of moving a BioSphere around, it's time to add another to the 3D workspace, so you can begin to see how they interact with one another. If there is already a BioSphere in the workspace, do the following only once, otherwise, do it twice.

- Click the **New** button below the 3D workspace. A BioSphere will be added to the 3D workspace.

The new BioSphere is added directly on top of the previous one. To see both at the same time,

- Click and drag on the **BioSphere Tool** or in the center of the BioSphere.

As you move the second BioSphere, you will notice a curious effect—the two BioSpheres want to stick together (*figure 25.4*)!

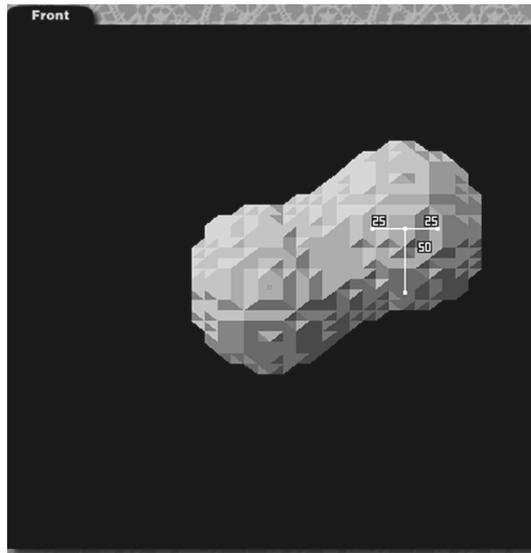


figure 25.4: Moving the Second BioSphere

This curious effect, and your ability to alter it is the secret of BioSpheres' modeling power.

25.5 Selecting a BioSphere

Once you have more than one BioSphere in the 3D workspace, you will have to select the one you wish to work with. If you will notice in *figure 25.4*, only one of the BioSpheres has the three intersecting green lines at its center; the other has just a **red dot**.

The BioSphere with the three lines or **Properties Handles**, is the **Current BioSphere**—only the Current BioSphere can be moved or edited. To make another BioSphere the Current BioSphere,

- Click the **red dot** in the center of any BioSphere.

That BioSphere becomes the **Current BioSphere**, and the **Properties Handles** appear at its center.

25.6 Editing BioSpheres Properties

Now that you know how to move the BioSpheres around and select them, it's time to find out what the properties mean, and how you can change them. Amorphium gives you control of the **Radius**, the **Oblateness** and the **Energy** of each BioSphere.

Oblateness The left arm of the **BioSphere Tool** (*figure 25.2*) and of the **Properties Handles** (*figure 25.3*), allows you to set the **Oblateness** of the BioSphere. The default value for **Oblateness** is 25. This value appears at the end of the **Oblateness** (left) arm on the **Properties Handles** on the **Current BioSphere**. To change the value,

- Move the pointer over the **Oblateness** arm of the **BioSpheres Tool**.

You will notice that the pointer changes to a left-right arrow.

- Click and hold the mouse button and drag the mouse left (for larger values) and right (for smaller values).

If you prefer, you may also set the **Oblateness** value by clicking directly on the dot at the end of the **Oblateness** arm of the **Properties Handles**. You will notice that the **Oblateness** arm of the **Properties Handles** lengthens or shortens in proportion to the **Oblateness** value.

The larger the **Oblateness** value, the wider and flatter the BioSphere becomes, the smaller the value, the flatter and smaller it becomes until vanishing entirely at 0.

Radius The right arm of the **BioSphere Tool** (*figure 25.2*) and of the **Properties Handles** (*figure 25.3*), allows you to set the **Radius** of the **Current BioSphere**. The default value for **Radius** is also 25. This value appears at the end of the **Radius** (right) arm on the **Properties Handles** on the **Current BioSphere**. To change the value,

- Move the pointer over the **Radius** arm of the **BioSpheres Tool**.

You will notice that the pointer changes to a left-right arrow.

- Click and hold the mouse button and drag the mouse left (for smaller settings) and right (for larger settings).

If you prefer, you may also set the **Radius** value by clicking directly on the dot at the end of the **Radius** arm of the **Properties Handles**. You will notice that

the **Radius** arm of the **Properties Handles** lengthens or shortens in proportion to the **Radius** value.

The larger the **Radius** value, the larger the **BioSphere** becomes, the smaller the value, the smaller it becomes, until vanishing entirely at 0.

Energy and Inverse Matter

The amount a **BioSphere** attracts or repels other **BioSpheres** is determined by the **BioSphere's Energy** value.

The bottom arm of the **BioSphere Tool** (*figure 25.2*) and of the **Properties Handles** (*figure 25.3*), allows you to set the **Energy** of the **BioSphere**. The default value for **Energy** is 50. This value appears at the end of the **Energy** (bottom) arm on the **Properties Handles** on the **Current BioSphere**. To change the value,

- Move the pointer over the **Energy** arm of the **BioSpheres Tool**.

You will notice that the pointer changes to a up-down arrow.

- Click and hold the mouse button and drag the mouse up (for smaller values) and down (for larger values).

If you prefer, you may also set the **Energy** value by clicking directly on the dot at the end of the **Energy** arm of the **Properties Handles**. You will notice that the **Energy** arm of the **Properties Handles** lengthens or shortens in proportion to the **Energy** value.

The larger the **Energy** value, the more powerful the **BioSphere** becomes, the smaller the value, the less powerful, until it does not attract other **BioSpheres** at 0.

It's possible for a **BioSphere's** energy to be less than 0, however. If you keep dragging upwards on the **Energy** arm of the **Properties Handles**, you will pass 0 and reach negative numbers. When a **BioSphere's Energy** value is **less than 0**, that **BioSphere repels** other **BioSpheres**.

The **BioSphere** itself is not visible when its energy is less than zero, but you can still see the **Properties Handles** when it's the **Current BioSphere**, or a red dot when it's not.

The **Energy** arm of the **Properties Handle** flips over to the top side (*figure 25.5*) when **Energy** is less than 0.

Figure 25.5 shows how a BioSphere with (from left to right) 100, 0 and -100 Energy, at the center of four other BioSpheres, affects them.

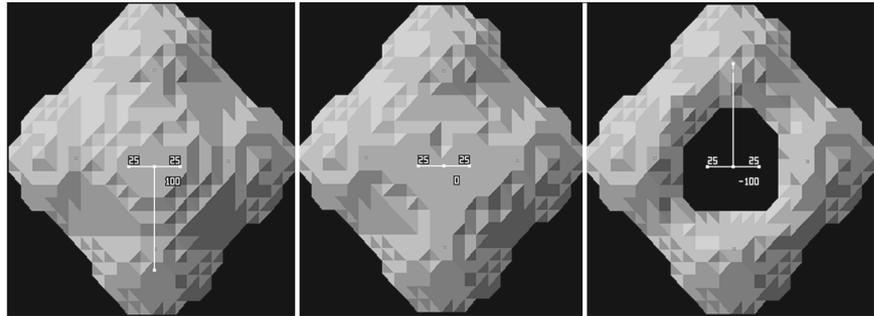


figure 25.5 How Energy affects other BioSpheres

Rotate and Bank

The Current BioSphere can be rotated using the **Rotate&Bank** tools. It might be difficult to see the effects of any such rotation, however, unless you have changed its Oblateness value.

25.7 Scene Controls

The Scene controls (figure 25.6) provide controls that affect all the BioSpheres in the 3D workspace at once.



figure 25.6: The BioSpheres Scene Tools

Threshold Threshold changes the Energy value of all BioSpheres in the 3D view at once. All BioSpheres retain their relative values, but increasing the Threshold lowers those values.

To change the Threshold:

- Move the pointer over the **Threshold** Button.

You will notice that the pointer changes to a left-right arrow.

- Click and hold the mouse button and drag the mouse left (for smaller values) and right (for larger values).

You will notice that the green sphere next to the Threshold button becomes brighter as Threshold value increases.

Smooth The **Smooth** option provides a smoother and more continuous look for the BioSpheres when you Preview or Generate them. You should leave this option checked.

25.8 Preview/Generate

When you want to see how the BioSpheres will look as a sculpture, and before you can use the rest of Amorphium's painting and sculpting tools on them, they must be created as a normal Amorphium object. This is done with the **Preview** and **Generate** tools.

Preview Preview gives you a quick way of checking how your BioSpheres sculpture will appear when it is rendered. To use it, first make sure there is at least one BioSphere in the 3D workspace, then:

- Click the **Preview** button.

The BioSpheres will be rendered from the current view as they would appear as a normal Amorphium model.

You will not be able to move or rotate the preview, you'll need to do that before you click Preview.

When you are ready to end the Preview:

- Click the mouse button anywhere on the Amorphium screen.

The BioSpheres will reappear in the 3D workspace, ready for editing.

Generate If you are happy with the way your BioSpheres sculpture has turned out, and you are ready to paint, texture or sculpt it, you will need to turn it into an Amorphium object.

Make sure at least one BioSphere is in the 3D workspace, then:

Click the **Generate** button.

Amorphium will create a single object from any BioSpheres present in the 3D workspace. Now when you go back to Amorphium's other modes (**Tools&Distorts**, **Paint&Optics**, etc.), the object will appear in the 3D workspace and can be selected on the **Choose** menu, from below the 3D workspace or saved as an Amorphium object.

25.9 Saving and Opening Biospheres

If you want to save your BioSpheres sculpture and continue to work on it at another time, you can do so from the **Save** menu, from below the 3D workspace.

A **Save File** window will appear on your computer and give you the chance to pick a location on your hard drive and a name for the file. BioSpheres files are saved with the **.bsph** extension

You can open a BioSpheres file previously saved on your hard drive using the **Open** menu from below the 3D workspace.



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Chapter 26: Composer

26.1 Introduction

Clicking on the **Composer** button at the top of the Amorphium screen displays the Composer tools (*figure 26.1*).

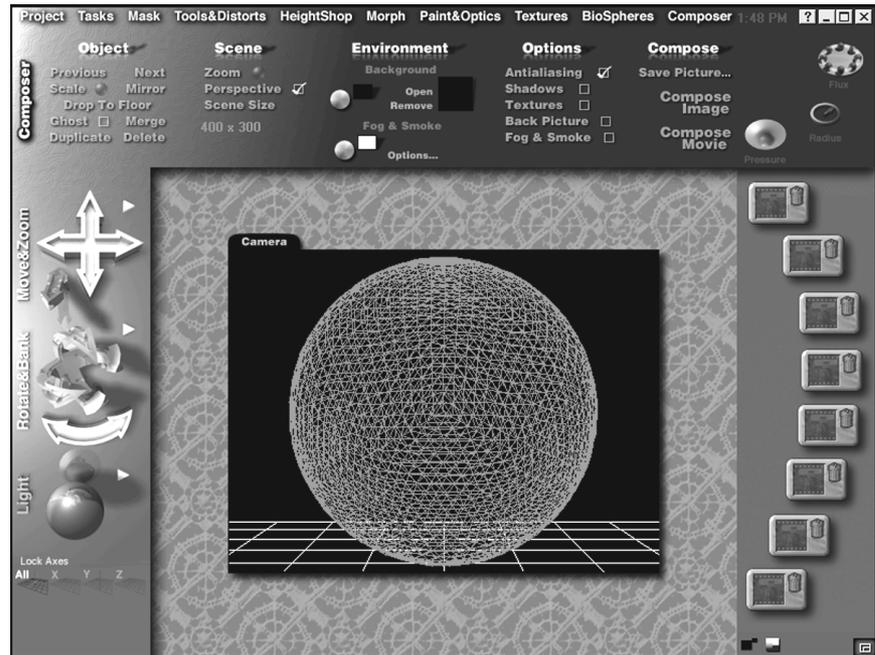


figure 26.1: The Composer Tools

The Composer tools allow you to render your objects into an image or animation. All the objects that you have created or loaded into Amorphium are presented here in wireframe drawing mode. You can select the objects, rotate them and position them over time.

What can be Animated?

Only one object can be animated, but several properties of that object can be animated as well, including **Position**, **Rotation**, **Distorts** or **Brush Tools** applied to the object, **Paint&Optics** properties, **HeightShop** brushing and **Texture Liquefy** brushing.

Fog&Smoke can be animated as well, but this is part of the environment rather than the object (see section 7, this Chapter).

26.2 Composer Workspace

The Composer workspace (figure 26.2) displays all of your objects along with a ground plane.

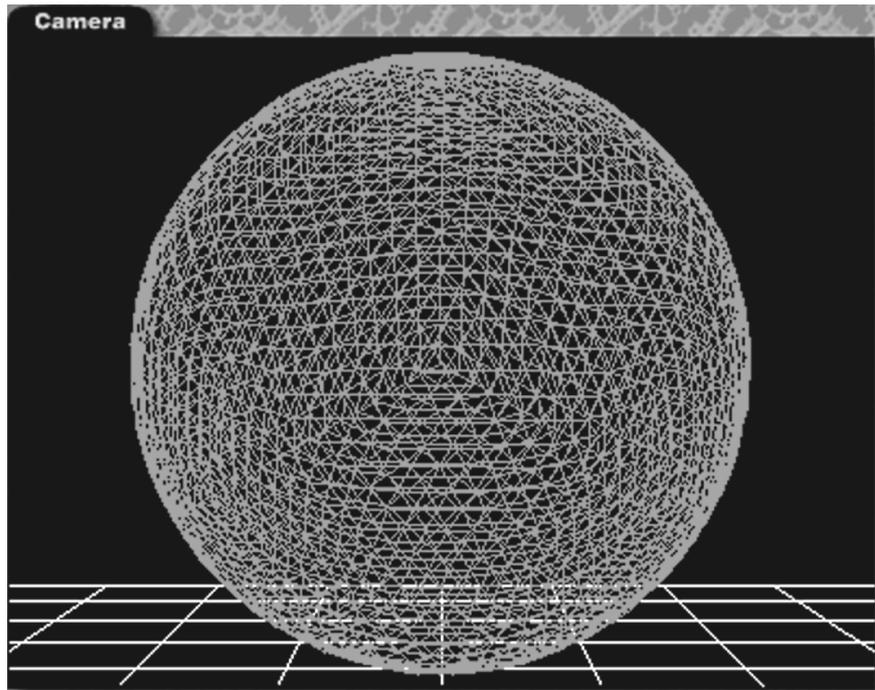


figure 26.2: The Composer Workspace

The ground plane is for reference only—it won't render in your scenes. Unlike the 3D workspace, you may select different sizes for the Composer workspace.

Changing Views

You can change your point of view of the **Composer workspace** by clicking the tab in its upper left corner (26.3) and selecting a new view from the menu which appears.

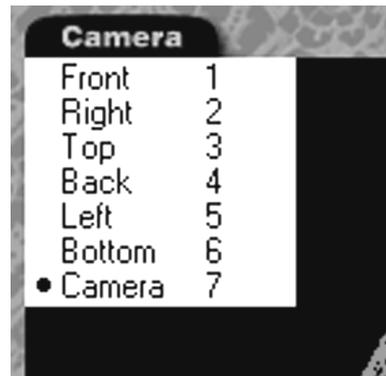


figure 26.3: The Composer Workspace View Menu

The current view is shown in the small tab at the top left of the **Composer workspace**.

- | | |
|--------|--|
| Front | This sets your point of view of the Composer workspace to the Front of the scene. You can also select it with the keyboard short cut 1. |
| Right | This sets your point of view of the Composer workspace to the Right of the scene. You can also select it with the keyboard short cut 2. |
| Top | This sets your point of view of the Composer workspace to the Top of the scene. You can also select it with the keyboard short cut 3. |
| Back | This sets your point of view of the Composer workspace to the Back of the scene. You can also select it with the keyboard short cut 4. |
| Left | This sets your point of view of the Composer workspace to the Left of the scene. You can also select it with the keyboard short cut 5. |
| Bottom | This sets your point of view of the Composer workspace to the Bottom of the scene. You can also select it with the keyboard short cut 6. |

Camera Amorphium opens with the point of view of the scene set to **Camera**. The **Camera** view is how the scene will appear when it is rendered. You can select the **Camera** view with the keyboard shortcut 7.

26.3 Key Frames

Amorphium allows you to animate the characteristics of a single 3D object. It does this through a system called keyframes (*figure 26.4*).



figure 26.4: The Keyframes

Keyframes represent in-between points on the way to a completed animation. When you want an object to be at a certain place at a certain time, set a keyframe for it. Amorphium will then figure out where the object should be between the keyframes and how it should move, performing the detailed work of animation for you.

You can set up to eight keyframes when you create an animation. These are represented by the keyframe symbols on the right side of the Composer screen. To add a keyframe, select the object that is to be animated and click on the first free keyframe (the keyframes are in numerical order 1-8 from top to bottom).

When a keyframe has been set, it will appear highlighted (*figure 26.5*).

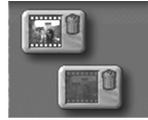


figure 26.5: Keyframes 1 & 2 with Keyframe 1 Set

Deleting a Keyframe

A keyframe may be deleted by clicking the **Trash Can** icon on the right side of its icon.

26.4 Object Controls

The **Object Controls** (*figure 26.6*), allow you to manipulate the objects in the **Composer workspace**.

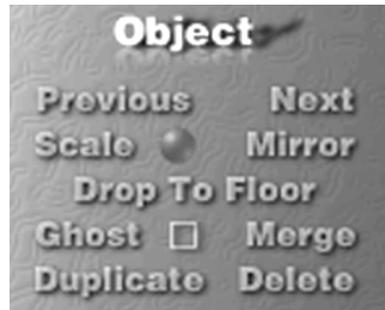


figure 26.6: The Object Controls

Next/Previous

Since you work with one object at a time in the **Composer workspace**, you will need a way to select other objects. You can do this with the **Next** and **Previous** buttons.

The current object is **Red**—any others appear **White**. If no object appears red, then the current object is considered to be the **View** of the scene, so clicking and dragging in the **Composer workspace** would move everything.

Scale

Scale allows you to change the size of the selected object interactively. Move the pointer over the **Scale** button—it will turn into an up-down arrow. Click

the mouse button and drag the mouse up to make the object smaller, and down to make it larger. The range of **Scale** is from 0 to 100%.

Mirror **Mirror** rotates the object around the y axis (horizontally). Using the **Mirror** command on an object will remove it from any hierarchy of which it is part .

Drop to Floor Clicking the **Drop to Floor** button causes the selected object to move vertically until it is resting on the ground plane.

Ghost Selecting **Ghost** will prevent the current object from being rendered as part of the scene. Ghosted objects appear dimmer than normal in the Composer workspace so you can recognize them at a glance.

Duplicate The **Duplicate** command creates an exact copy of the current object. The duplicate object is in the exact same place as the original, so you will need to move or rotate one of them.

Merge The **Merge** command is used to combine two objects in the Composer workspace into a new single object.

The two objects that were merged to make the new object are unaffected by the operation.

Using Merge To use **Merge**:

- Make the first object to be merged the current object.
- Click **Merge**.
- Click the second object to be merged.

Cancelling Merge You can cancel the **Merge** operation by clicking in an empty area of the Composer workspace instead of on a second object.

Delete The **Delete** command removes the current object from the Composer workspace. Amorphium will give you a chance to confirm the operation before deleting the object.

26.5 Scene Controls

The **Scene** controls (figure 26.7) allow you to manipulate the entire scene at once, rather than an object at a time.



figure 26.7: The Scene Controls

Zoom The **Zoom** button moves the Camera (your point of view of the scene) in and out.

Using **Zoom** To use **Zoom**:

- Move the pointer over the **Zoom** button—it will turn into an up-down arrow.

Click the mouse button and drag the mouse up to zoom out from the scene, and down zoom in.

The range of **Zoom** is from 0 to 100%.

Perspective When the **Perspective** option is checked, objects farther from the camera seem smaller. When **Perspective** is unchecked, your view of everything is straight on, with objects appearing the same size, regardless of their distance from the camera.

Scene Size

Clicking on Scene Size opens a pop-up menu (figure 26.8) from which you can select a preset size for both the **Composer workspace** and the size of rendered images and movies.

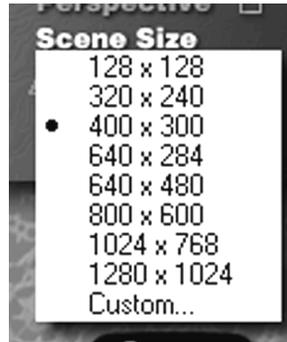


figure 26.8: The Scene Size Pop-up Menu

The default size for both the **Composer workspace** and rendered output is 400x300 pixels. If the size you wish to use does not appear on the pop-up menu, select the **Custom...** option to open the Scene Size panel (figure 26.9).

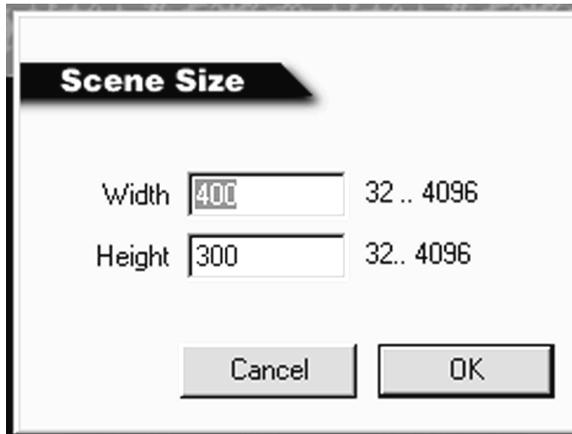


figure 26.9: The Scene Size Panel

You may enter a custom size for your scene from anywhere between 32 and 4096 pixels for both width and height.

In any case, the current size is always shown (400X300 in *figure 26.7*) under the Scene Size button.

26.6 Environment—Background

Another important aspect of a scene is the **Background**. The **Background** controls (*figure 26.10*) allow you to determine how it will appear.

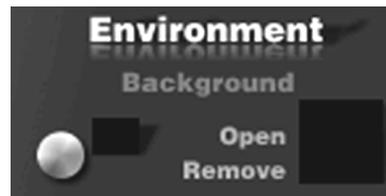


figure 26.10: The Background Controls

Background Color

You can set the **Background Color** (which is black by default) using the color wheel or the color square (above and to the right of the color wheel). The color you select will become the background, and will appear behind all the objects in the rendered output.

Setting the Current Background Color

Clicking and holding on the **Current Background Color** will bring up a copy of the **Palette** (*Chapter 23, section 2*), and the pointer will change to an eyedropper. You can select a color from the **Palette**. The **Current Background Color** will change color as you drag over the **Palette**. Release the mouse button when the **Current Background Color** indicates the color you want.

Clicking on the **Color Wheel** next to the **Current Background Color** will open the **System Palette** (*Chapter 13, section 10*) for your computer.

Background Picture

In addition to a solid color, you can also choose an picture to appear as the background.

Loading an Image

To load an object as the **Background Picture**, click on the **Open** button. An Open File box will appear allowing you to select an image from your computer hard drive. The image you select will appear as the **Current Background Picture**, next to the **Open** and **Remove** buttons. The **Current Background Picture** can be cleared by clicking the **Remove** button.

26.7 Environment—Fog

Another important aspect of a rendered scene can be fog. The **Fog & Smoke** controls (*figure 26.11*) allow you to



figure 26.11: The Fog Controls

You can adjust the characteristics of the haze that appears in the scene with these options. To enable the **Fog&Smoke**, you need to check the **Fog&Smoke** option (*section 8, this Chapter*).

Fog Color

You can set the **Fog Color** (which is white by default) using the **Color Wheel** or clicking directly on the **Current Fog Color**. The color you select will become the **Current Fog Color**.

Setting the Current Fog Color

Clicking and holding on the **Current Fog Color** will bring up a copy of the **Palette** (*Chapter 23, section 2*), and the pointer will change to an eyedropper. You can select a color from the **Palette**. The **Current Fog Color** will change color as you drag over the **Palette**. Release the mouse button when the **Current Fog Color** indicates the color you want.

Clicking on the **Color Wheel** next to the **Current Fog Color** will open the **System Palette** (*Chapter 13, section 10*) for your computer, from which you can also pick a color to use for the fog.

Fog Options Clicking Options... button (figure 26.12) opens the Fog Options panel, allowing you to set many fog characteristics.

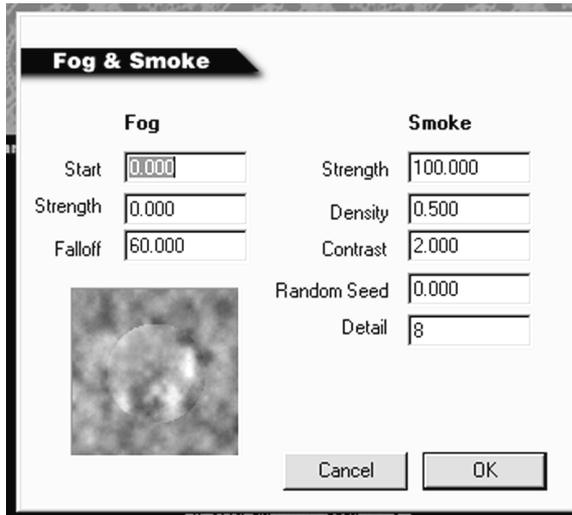


figure 26.12: The Fog&Smoke Options Panel

- | | |
|----------------|---|
| Fog Start | Fog Start determines the distance from the camera from which the Fog first appears. |
| Fog Strength | Fog Strength sets the thickness of the fog which is far away from the view point. |
| Fog Falloff | The Fog Falloff setting determines how quickly the fog thins out over distance. Low falloff means stronger fog, and high falloff means thinner fog. |
| Smoke Strength | Smoke Strength sets the visibility of smoke in the scene. The range of values is 0 to 100%. |
| Smoke Density | The Smoke Density setting determines the thickness of the smoke. Higher density means more smoke in a given volume of space, and lower density means less. |
| Smoke Contrast | The Smoke Contrast setting determines the difference between white areas (with smoke) and black areas (no smoke). |

- Random Seed** The **Random Seed** is the random number used to create smoke. You can set this to different values at different keyframes to make the smoke move in an animation.
- Smoke Detail** The **Smoke Detail** setting allows you to make the smoke more or less distinct. The larger the number, the more distinct the smoke will be.

26.8 Options

The **Composer Options** (figure 26.13) allow you to set several very important properties for your scene before you render it. When you are testing the scene for placement of objects only, for example, you would probably want to leave these options unchecked, because they can slow down the rendering process.

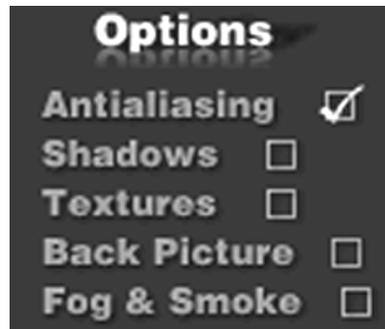


figure 26.13: The Composer Options

- Antialiasing** Selecting the **Antialiasing** option creates smoother rendered scenes by removing any jagged edges at the edges of objects. It will take somewhat longer to render scenes with Antialiasing on, but for final output, it is usually worth it.
- Shadows** Selecting the **Shadows** option enables shadows to be rendered in the scene. Shadows take extra time to render but add a great deal of realism to the image.
- Textures** Selecting the **Textures** option allows textures to be rendered with the objects. Textures are also very important for the realism they provide.
- Back Picture** Selecting the **Back Picture** option will enable any **Background Picture** (see section 6, this Chapter), to be rendered.

Fog & Smoke Selecting the **Fog & Smoke** option will allow fog and smoke to be rendered in the scene (see section 7, this Chapter).

26.9 Compose

When you are ready to turn your scene into a picture or a movie, you will use the Compose controls (figure 26.10).



figure 26.10: The Composer's Compose Controls

Save Picture... Clicking the **Save Picture** button opens a **Save File** box on your computer, from which you can pick a name, location and picture format for your composed images. Amorphium supports any of the following formats:

- **PICT** (Mac Only) With or Without an Alpha Channel
- **BMP** (PC Only)
- **Image** With or Without Alpha, compressed/uncompressed
- **TIFF** With or Without an Alpha Channel
- **PNG** With or Without an Alpha Channel
- **GIF** With or Without an Alpha, compressed/uncompressed, Dithered, Interlaced.

Once you have selected a name, and pressed **OK**, Amorphium will render the scene in the **Composer workspace** from the **Camera** view, and save the result in the location you specify on your hard drive.

Compose Image

Clicking the **Compose Image** button will render the scene in the **Composer** workspace from the **Camera** view. No image will be saved on the hard drive. To save a picture, use the **Save Picture...** button.

26.10 Compose Movie Options

Clicking the **Compose Movie** button opens the **Compose Movie** panel (figure 26.11), from which you can specify how the movie will be created.

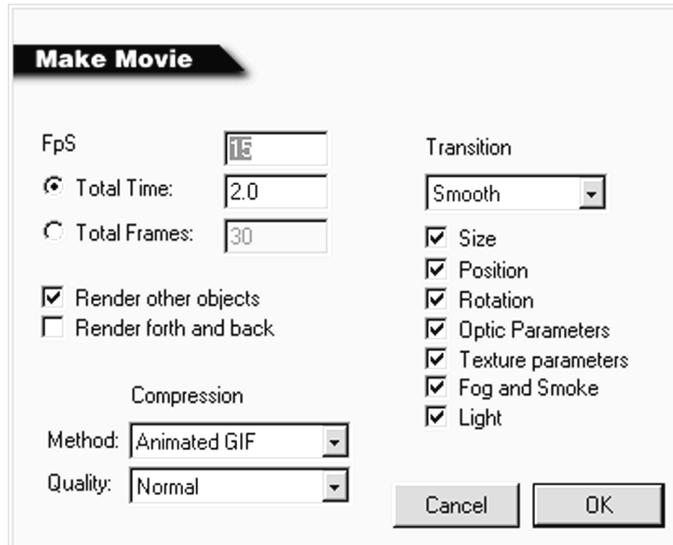


figure 26.11: The Compose Movie Panel

FPS

Stands for **Frames Per Second**. The number of frames to render in each second of animation.

**Total Time/
Frames**

Lets you select the length of the movie based on either time, or number of frames. If you want a 2 second animation, select the **Total Time** option and enter 2.0. If you would rather specify the total number of frames, select the **Total Frames** option and enter the total number of frames there..

**Render Other
Objects**

When the **Render other Objects** option is checked, Amorphium will render all the objects in the **Composer** workspace, instead of just the one which you have selected for animation.

- Render Forth and Back** Selecting the **Render Forth and Back** option basically doubles the length of the animation by rendering the movie again in reverse order after the last frame has rendered. For a 5 frame animation, you would get the following frame order: 1-2-3-4-5-4-3-2-1.
- Compression** The Compression options determine how the rendered movie will be compressed, which is important in determining how it will appear when it is played back, and how much space it will take up on the computer hard drive.
- Method The **Compression Method** specifies which Codec (short for Encoder-Decoder) will be used to compress the movie. The default method is **Animated GIF**, but you have many other choices.
- Quality The **Compression Quality** setting specifies how much compression the selected **Compression Method** will apply to the movie as it is save. There is a direct relationship between output quality and the size of the completed movie. Higher **Quality** settings will create larger files, but lower **Quality** settings create less clear images.
- The **Minimum Quality** setting creates the smallest file but the poorest image, while the **Lossless Quality** setting creates the best image, and the largest file size.
- Normal Quality** is the default setting which offers a good compromise between file size and image quality.
- Transition** The Transition setting determines how the animated object behaves as it moves between the keyframes.:
- Sharp Selecting the **Sharp** option will create abrupt changes in direction around the keyframes.
- Gentle Selecting the **Gentle** option will create very slow and exaggerated changes in direction around the keyframes.
- Smooth **Smooth** is the default **Transition** setting. Selecting the **Smooth** option creates natural, smooth changes in direction. For most applications, this should be your choice.
- Render Options** These options give you a way to enable or disable animation for the **Size, Position, Optic Parameters, Texture Parameters, Fog&Smoke and Light** attributes before rendering.

Saving the Movie

When you click on the OK button to close the Make Movie panel, Amorphium will ask you to choose a name for the movie and a location to save it on the computer hard drive, and then it will begin rendering the frames.

You will see each frame as it is rendered and then when all frames have been rendered, Amorphium will play the movie. To end the movie, click anywhere outside of the movie.

Cancelling a Render

You may stop Amorphium from rendering at any time by pressing the Esc key.

26.11 Object Positioning

While in Composer mode, the Rotate&Bank pop-up menu no longer has the Potter's Wheel commands. Instead, there is an added Position item that opens the Object Position panel (*figure 26.11*).

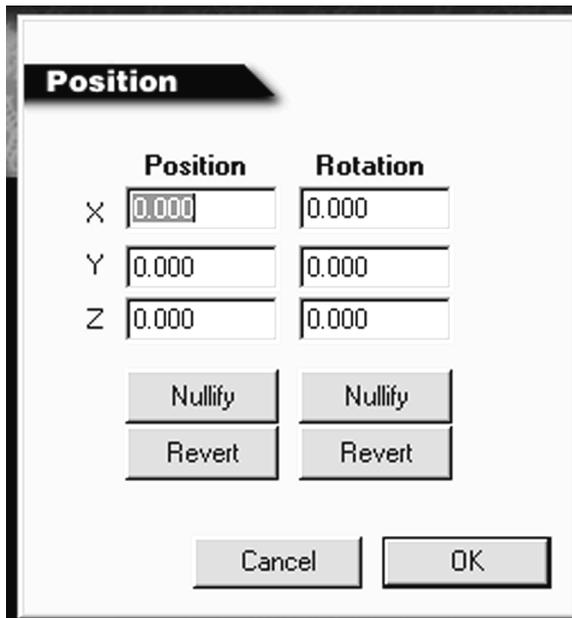


figure 26.11: The Object Position Panel

You can enter specific values for the object's **Position** in each of the axes, as well as specific **Rotation** values in degrees.

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Chapter 27: Keyboard Shortcuts

27.1 Macintosh Keyboard Shortcuts

(mb=mouse button)

Object Manipulation

Function	Shortcut
Move	spacebar+mb
Fast Move	Shift+spacebar+mb
Rotate	Cmd+mb
Fast Rotate	Shift+Cmd+mb
Zoom	Cmd+spacebar
Fast Zoom	Shift+Cmd+spacebar
Adding the z key to the above applies to the Left Morph Window	
Adding the x key to the above applies to the Right Morph Window	
Add/Delete Snap Point	Option+mb
Choose Next Object	Up Arrow
Choose Previous Object	Down Arrow
Cycle Axes Lock Modes	Tab
Delete Object	Delete

Select Mode

Function	Shortcut
Tasks	q
Mask	w
Tools&Distorts	e
HeightShop	r

Function	Shortcut
Morph	t
Paint&Optics	y
Textures	u
BioSpheres	i
Composer	o

Select View

Function	Shortcut
Front	1
Right	2
Top	3
Back	4
Left	5
Bottom	6
Custom	7
Potter's WheelOn/Off	p

Holding down the **Option** key while clicking the **New** or **Open** button from the underneath the 3D workspace will replace the existing model with the new or opened one.

27.2 PC Keyboard Shortcuts

(lmb = left mouse button)

Object Manipulation

Function	Shortcut
Move	spacebar+lmb
Fast Move	Shift+spacebar+lmb
Rotate	Ctrl+lmb
Fast Rotate	Shift+Ctrl+lmb
Zoom	Ctrl+spacebar
Fast Zoom	Shift+Ctrl+spacebar
<i>Adding the z key to the above applies to the Left Morph Window</i>	
<i>Adding the x key to the above applies to the Right Morph Window</i>	
Add/Delete Snap Point	Alt+lmb
Choose Next Object	Up Arrow
Choose Previous Object	Down Arrow
Cycle Axes Lock Modes	Tab
Delete Object	Backspace

Select Mode

Function	Shortcut
Tasks	q
Mask	w
Tools&Distorts	e
HeightShop	r
Morph	t

Function	Shortcut
Paint&Optics	y
Textures	u
BioSpheres	i
Composer	o

Select View

Function	Shortcut
Front	1
Right	2
Top	3
Back	4
Left	5
Bottom	6
Custom	7
Potter's WheelOn/Off	p

Holding down the **Alt** key while clicking the **New** or **Open** button from underneath the 3D workspace will replace the existing model with the new or opened one.



Part IV
Appendices

Contacting Electric Image

By Mail or Fax If you would like to write to us about Amorphium, you can reach us at:

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3 Imperial Promenade #400
Santa Ana, CA 92707
Fax: (714) 556-4415

Amorphium World
Wide Web Site

For those of you who are online, There is a whole host of support information, user downloads and message boards at:

www.amorphium.com



Glossary

2D

Refers to objects with height and width only. Amorphium can use 2D objects such as images for texture and height maps.

3D

Refers to objects with the properties of height, width and depth.

24-bit

Refers to graphics or images where 24 digital bits are used to describe each pixel. This allows any pixel to be any of 16.8 million colors creating photo-realistic images. 24-bit images are sometimes referred to as true color.

3D Workspace

The portion of the Amorphium interface where all objects appear.

A Alpha Channel

The portion of an image which contains transparency information. This is typically a gray scale with white presenting totally transparent, black representing totally opaque and the gray values in between representing varying levels of transparency. Graphic file formats which support an Alpha Channel include PICT, TGA and TIFF.

Ambient Light

The amount and quality of the light in a scene that does not come directly from the light source.

Antialiasing

A technique for smoothing details in a scene. Can be especially effective along diagonal lines.

Axis

An axis corresponds to the three dimensions which help describe how an object is moved. The x-axis runs along the plane of the screen horizontally, the y-axis runs along the plane of the screen vertically, and the z-axis lies perpendicular to the plane of the screen.

B Bank

To change the orientation of an object by rotating it around its z axis.

BioSpheres

BioSpheres are the basic building blocks of a method of creating 3D objects which would be difficult if not impossible to create with other modeling tools.

BMP

A single-image graphics file format used on Windows PCs. The images are not compressed and the format is therefore lossless. The format does not support an integral alpha (transparency) channel.

Brushes

The set of Amorphium tools which describe the shape of the tool which will sculpt or paint an object.

Brush Tool

The set of Amorphium tools which determines how the tool defined by the Brush and its Pressure, Radius and Flux modifiers will be applied to an object.

C Camera

The camera in Amorphium looks at the 3D object much the same way as a video camera looks at a subject. The camera can be zoomed in and out from the scene. Also refers the point of view of the camera.

Composer

The set of Amorphium tools which allow you to create pictures and movies from the 3D objects you create.

Compression

The technology of taking large amounts of data (sometimes a digital video image) and carefully squeezing it down to a much smaller size for easier storage and manipulation.

CPU (Central Processing Unit)

The computer's microprocessor chip, the brains of the outfit. Typically, an integrated circuit using VLSI (very large scale integration) technology to pack several different functions into a tiny area. The most common electronic device in the CPU is the transistor, of which several thousand to several million or more are found.

D Distorts

The set of Amorphium tools which apply an effect to the entire object at once—as opposed to modifying a part of it with a brush.

Diffuse

The optical property of an object which determines its response to the light in the scene.

Double-Click

The act of clicking on an item with the mouse button twice in rapid succession. This act opens files, and runs programs.

F Flux

Refers to the property of a brush which describes the intensity of the flow of particles when it is used to paint or sculpt an object.

FontMan

The Amorphium tool used for creating 2D and 3D text objects.

fps

Frames Per Second. The number of frames in every second of animation. Higher numbers create smoother animations. For comparison, film runs at 24fps and television at 30fps (actually, it's 29.97fps, but you don't want to go there).

Frame

The building block of an animation. Each frame is a static picture of an object which, when played back in sequence, create the illusion of motion

G GUI

Graphical user interface. The buttons, menus and workspace associated with a program or operating system.

H Height Map

The process of using a 2D image to add depth to a 3D object.

I Icon

The little picture that represents an object – a program, file, command – making it easier to figure out that object's function. Picture icons are abbreviated Picon.

Irrational Number

Some of the most terrifying numbers of all. These numbers have fractional portions which repeat forever without any discernible pattern. As far as anyone knows. Famous irrational numbers include π (pi) and e (Euler's Constant).

J JPEG (Joint Photographic Experts Group)

An image compression format devised by the Joint Photographic Experts Group. JPEG is a very efficient yet lossy compression format, meaning that some data is lost whenever an image is compressed - the amount of loss depends on the degree of compression.

K Keyframe

A keyframe is the collection of all information about an object (position, rotation, texture, etc.) at a given time. An animation is created by moving an object and setting keyframes.

L Left-Click

To click the left button of the mouse while the pointer is over an object. This action is used to *select* the object.

Light

In Amorphium, the source of illumination for everything in the 3D workspace.

M Mask

The process of protecting certain areas of an object from being affected while operations such as painting or sculpting are performed.

MeshMan

The set of Amorphium tools which allow you to create primitive objects or change the number of polygons in existing objects.

MHz (Megahertz)

A unit of measurement indicating the frequency of one million cycles per second. One hertz (Hz) is equal to one cycle per second.

Model

a) The process of creating a three-dimensional object. b) A three-dimensional object.

Modem (MODulator-DEModulator)

A device that converts electrical signals from a computer into an audio form for transmission and reception over telephone lines. The modem transforms digital signals from a computer (such as e-mail messages or Performer movies) into the analog form that can be carried successfully on a phone line; also demodulates signals received from the phone line back to digital signals before passing them to the receiving computer.

Morph

The process of smoothly changing one object into another. Morphing applies to both two and three-dimensional objects. Morphing is used frequently in movies and television as a special effect—aliens like to disguise themselves as ordinary people, for example, and when they show their true appearance, this is often accomplished with a morph.

MPEG (Moving Pictures Experts Group)

Whereas JPEG is based on still images, MPEG is based on motion and sound. It is a popular method for motion video and audio compression. Lossy compression permanently discards unnecessary data, resulting in some loss of precision. MPEG1 and MPEG2 are implementations of this scheme. MPEG2 is the compression method used in DVD disks and several forms of direct broadcast satellite. Video compressed too much with the JPEG or MPEG methods results in square artifacts or 'blocks' in the images.

N Normal

A normal is an imaginary line originating at the center of a polygon. The Normal points straight out from that surface at a right angle, or perpendicularly.

ns (Nanosecond)

One billionth of a second. Physicists sometimes refer to a nanosecond as a *shake*, as in *three shakes of a lamb's tail*, but then again, physicists are almost as strange as mathematicians. And at least as irritable.

P Perspective

The contraction (shrinking) of objects over distance as viewed by the human eye or a camera. The further away the object, the more contracted it appears. Viewing 3D objects in perspective helps us distinguish their shape.

Polygon

In Amorphium, an object is divided into polygons—essentially little triangles. The more polygons in an object, the smoother it will appear, but the longer it will take to render.

Preferences

A collection of settings that let you customize the appearance and operation of a software program.

Pressure

Determines the strength with which the brush is applied to an object. Negative pressure pushes in on the object, and positive pressure pulls out on the object.

Primitive

A collection of simple three-dimensional shapes (Sphere, Cube, Tetrahedron, Cylinder and Cylinder with Caps) which can be used as the starting point for more complex objects.

Q QuickTime

A format for digitized moving video developed originally by Apple for Macintosh computers. QuickTime “movies” can be used with many Mac and PC applications—such as Amorphium.

R Radius

Describes the size or area of effect of a brush as it is applied to an object.

RAM (Random Access Memory)

Active but temporary computer memory. RAM information is lost when the computer is shut off. As opposed to ROM.

Reboot

To restart the computer. “Soft” reboot does not interrupt electricity to the computer and is sometimes referred to as ‘Reset’. “Hard” reboot is turning the machine off and then on again.

Render

Rendering is the process of creating images and movies from the model the 3D work-space. It works by taking a picture of the scene from the point of view of Amorphium's camera.

RGB (Red, Green, Blue)

The three additive primary colors used to construct video images.

Right-Click

On the PC—to click on the right button of the mouse. As opposed to left-click.

ROM (Read Only Memory)

Permanent computer instructions (data) on a chip.

Rotate

To change the orientation of an object by rotating it around its x or y axes.

S Scene

The collection of all information—light, object, textures, etc.— that describes how an object will appear when it is rendered.

Script

The process of creating an Amorphium object can be recorded and saved into a script, or task.

SCSI

Small Computer Systems Interface. A chain consisting of a 50 pin cable and a protocol for sending and receiving commands. It is used to connect computers and peripheral devices such as hard drives. Pronounced “scuzzy”.

Software

Computer components with no real physical form; software is a coded series of instructions that can be written out or recorded onto memory devices (chips, disks, CDs, etc.) but is itself considered intangible, as opposed to hardware.

Specular

The optical property of an object which describes how highlights form on the object when a light is shined on it.

Surface

The surface of an object. The object, and therefore the surface, is composed of polygons.

Symmetry

A brush modifier which allows multiple brush strokes to be applied at once—several different patterns are available.

T Texture Map

To add the color information of a 2D image to a 3D object.

TGA

A graphic image file format popularized in the late-eighties with the Targa graphics card.

V View

The point of view on the 3D workspace—Front, Right, Left, Top, Back, Bottom.

Z Zoom

To move the camera in or out from the scene. The effect is that the object appears to shrink and grow, but is not actually changed.



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