CosmoSaver-Solar System

Introduction

The CosmoSaver   is not an ordinary set of multimedia screen savers.   These are interactive 3D screen savers of the planets and sun that can be configured in endless varieties.   CosmoSaver-Solar System contains 12 modules for the nine solar system planets and the sun.   Each object is based on three dimensional surface maps, and can be viewed from any distance and orientation, in addition to being viewed in four animation modes.   This configuring can be done directly from the CosmoSaver main dialog box, or from an Explore Mode window.

Before learning how to use CosmoSaver-Solar System, you can check to make sure that you are running under the Minimum System Requirements, and read the important tip about setting your system to at least 16 bit color, if you have Super VGA available.

CosmoSaver runs right out of the box as a screen saver.   Check Installing Screen Saver to see if you have done everything correctly to start the screen saver.

To learn how to begin using CosmoSaver-Solar System to configure your animations, an excellent starting point is learning about using the CosmoSaver Main Window.

See also:

CosmoSaver Modules
Animation Modes
Screen Saver Hot Keys
Contacting MicroRealities
Registration
Astronomy Fundamentals
Things To Try

Minimum System Requirements

60 Mhz 486DX or better recommended.
5 MB RAM
7 MB Hard Disk Space
VGA

A Note to Super VGA Users

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If your system is set to display 256 colors, it is recommended you run in
Super VGA mode.  The program still works well in VGA mode, but you are not
using your hardware to fullest advantage. Click Control Panel from the
settings section and choose the display icon.  From there, click the settings
tab and you will see a choice of color and display sizes.  Choose at least
16-bit high color, so that at minimum, 65,536 colors can be displayed. This
step is important because with 256 color VGA mode, the screen saver alters
the 256 color palette to suit planet.  Basically, the program chooses the
best 256 colors out of 260,096 colors available in VGA and Super VGA to
render the best planetary image.  For instance, when Mars is displayed, the
system palette will contain many shades of red and orange.  When Saturn is
displayed, the 256 color system palette will contain many shades of yellow
and brown.  With 16 or 32 bit color, there is no need to alter the system
palette, and there will be no possibility of flicker with other color-
intensive applications.
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Installing Screen Saver

1. In Windows 95, move the mouse to the **Start Menu**.and click once.
2. Move the mouse to **Settings.**
3. Move the mouse to **Control Panel** and click once.
4. From the **Control Panel**, chose the **Display Icon** and double click.
5. Click the **Screen Saver** tab.
6. You should see "CosmoSaver-Solar System" as your current screen saver in the screen saver selection box.   If you do not, it is most likely because you see "None" as the current screen saver, meaning that no screen saver will come on.   In that case, choose, "CosmoSaver-Solar System" as your current screen saver.
7. Choose a suitable time interval from the **Wait ... minutes** box for the screen saver to come on.
8. Click **Preview** to see how the screen saver will look, like.
9. Click **Settings** where you can access the **CosmoSaver Main Window** to configure the screen saver.   This can also be accessed from the **Start Menu** by clicking on the **CosmoSaver icon,** a picture of the earth.   As a matter of fact, this is the most preferable way to access the window.
10. If you wish password protection, make sure the **Password Protected Check Box** is checked, and click the password **Change Button** to change the password.   This password is the same for allWindows 95 screen savers.   Windows 3.X screen savers have their own password system.

When the screen saver is on, the screen saver cycles through all of the 12 modules.   In between the animations, you seen the banner, "Beginning Animation ... Please Wait".   During this time calculations are being done and images are being loaded.   The amount of time that a module is on can be set by controlling the "Change After ..." gauge at the bottom of the CosmoSaver Main Window.

CosmoSaver-Solar System Modules

CosmoSaver-Solar System cycles through the sun or the following planets:when the screen saver is turned on.

- **Sun**
- **Mercury**
- **Venus-Normal**
- **Venus-Cloudless**
- **Earth-Normal**
- **Earth-Cloudless**
- **Mars**
- **Jupiter**
- **Saturn**
- **Uranus**
- **Neptune**
- **Pluto**

Each of these modules draws the given object based on a three dimensional surface map. These objects can be viewed for any date, time, distance, orientation, date and time as well as in any of four animation_modes.

In Explore Mode, you can switch between planets by clicking on the correct icon. When the screen saver is on, the screen saver cycles through all of the above modules. In between the animations, you seen the banner, "Beginning Animation ... Please Wait". During this time calculations are being done and images are being loaded. The amount of time that a module is on can be set by controlling the "Change After ..." gauge at the bottom of the CosmoSaver Main Window.

Animation Modes

Image
Image of sun or given planet at specified settings.

Sky View
Calculates time lapse view of sky from given altitude, azimuth, and elevation.   See Sky View Dialog Box for configuring these and other settings.   For earth, this shows a blue sky during daylight, and a darkening sky at sunset.   From a high enough elevation the sky is always dark because there is no atmosphere to scatter sunlight as a blue sky is caused by the atmosphere scattering sunlight.   From 500 km above Atlanta, and facing south, one could see the Florida penninsula, Cuba, and the northern tip of South America.   This animation mode takes the longest to calculate, but it is often the most spectacular.   Try it also for Mars and see a darkening orange sky as the sun sets.

Time Step
The view of the planet or sun is repeatedly calculated in real-time for the specified time step interval.   This shows the module planet rotating with the sun and other planets moving in the background if they are in view.   The stars are more less stationary, changing due to precession over hundreds of years.   The animation begins from the location of the Reference and Latitude and Longitude.

Custom Orbit
See the planet from a custom defined orbit that you travel along.   You can define a north pole for the orbit and the maximum and minimum distances.   Kepler's Third Law implies that the farther a satellite is from a planet, the slower the satellite travels.   That is what you see when your orbit is non-circular.   The custom orbit parameters can be set through the Custom Orbit Dialog Box.

See Also:

CosmoSaver Main Window

CosmoSaver Main Window

CosmoSaver can be configured from the main program window.   This can be accessed by clicking the program icon, a picture of the Earth acessed from the Windows 95 Start Menu, or from the Windows 95 screen saver configure window.   This window is the dialog box that allows you to configure all of the CosmoSaver modules in fine detail by pressing any of the following buttons: Note that all of the functionality of the **Configure** and **Preferences** buttons can be achieved by entering Explore Mode by pressing the **Explore** button.   This is the simplest way of configuring.

Important:
All of your settings can be saved by pressing OK upon exiting or the Save Screen Saver Settings button, , in Explore mode.

On/Off
Turning this check box on turns CosmoSaver-Solar System on as the current screen saver in the Windows 95 Display Control Panel, and turning it off   loads in the last screen saver used before this one.   However, this setting has no effect if no screen saver is selected.

Randomize
Turning this check box on turns on the Randomize option.   In Randomize mode, the screen saver animations are generated randomly, within the constraints that the animation be reasonably appealing.   Otherwise, the animations are generated according to your configuration settings.

Module On/Off
Toggles the state of the the currently selected module in the module list box between on and off. An "x" beside the name in the list box indicates that the module will be displayed when its turn arrives, whereas no "x" indicates that the module will not be shown.

Configure
Brings up the Configure Module Dialog Box where the module selected from the module list box on the left can be configured according to orientation, distance,animation mode, date, and time. All the settings in this dialog box effect only the currently selected module.

Preferences
Brings up the Preferences Dialog Box where settings affecting all of the screen saver modules can be controlled.   These would be limiting magnitude, rendering method, and labelling options

Test Module
Tests the module selected form the module list box on the left in a normal, full-size, borderless screen-saver window.

Explore
Enters the interactive Explore Mode where the modules will be displayed inside a resizeable window, and where all the settings can be controlled through menus.

Set Password
Pulls the <u>Set Password Dialog Box</u>, where password protection can be enabled and the password can be set.

Change After ... Minutes
Adjusting the ruler determines how many consecutive minutes the screen saver module will be visible before switching to the next module.

Register
Brings up dialog box to register the software.   This button is disabled upon registration of the software.

Explore Mode

Explore Mode is an interactive mode where menu commands are used to control the animations. The animations are rendered in a resizeable window with the menu giving it the look and feel of a normal Windows astronomy program. Clicking on any location within a planet or sun will bring bring that location into the center.   Explore Mode can be entered by clicking the **Explore** button in the CosmoSaver Main Window.   The CosmoSaver main window can be used for viewing and configuring the animation modules, but Explore Mode is often easier for this.   All of the settings in current session can be saved by choosing Edit|Save Screen Saver Settings from the main menu of **Explore Mode**, or hitting the button.

Configure Module Dialog Box

This dialog box allows you to configure the display of any module.   All of the options that are controlled from here are specific for each module.

Latitude and Longitude Sliders
Adjusting these sliders determines the <u>Reference Latitude and Longitude</u> on which the planet or sun will be centered.

Distance Slider
Adjusting this slider sets the distance from which the module object is viewed.   There are two distance scales.   The first scale has units are in equatorial radii, except for Saturn, for which they are in outer ring radii.   The second has units in astronomical units (AU).   An astronomical unit is the mean distance between the earth and sun, which is about 92.7 million miles=149.6 million km.   See the <u>Solar System Table</u> to gain an idea of AU distances.

Animation Mode Combo Box
Any one of the four <u>Animation Modes</u> can be chosen by clicking on this combo box.

Date Selection Options

> **Use Current Date/Time**
> Display objects as they appear for the current date and time.   Setting this option will override the date and time in the edit boxes below.

> **Select a Date**
> Always display objects as they appear for the date and time given in the date and time edit boxes below.

Local Date and Time Fields
Local Date and Time can be entered in fields.   Whether or not it is Standard or Daylight Saving Time is automatically accounted for.   Also, the Julian Day field below will automatically updated.

Julian Day Fields
The <u>Julian Day</u> can be entered into these fields.   The Local Date and Time fields above will automatically be updated.

Time Step Fields
Set the time interval for the animations.

Preferences Dialog Box (Accessed From CosmoSaver Dialog Box)

This dialog box allows you to control settings that apply to all of the modules.

Rendering Options
> **<u>Turbo vs. Precison Rendering</u>**
> **<u>Render by Magnitude vs. Render by True Size</u>**

Labelling Options
Setting these check boxes allow control of label planets, stars, and satellites.

Limiting Magnitude Slider
Controls the limiting magnitude of the background sky.   The higher the limiting magnitude, the more spectacular the view, but rendering takes longer.

Contacting MicroRealities

Order Toll Free: (800)-213-8802
tel: (705) 524-9331
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Visit **Web Site: http://icewall.vianet.on.ca/comm/microrealities** for news about MicroRealities products, as well as useful tips.

MicroRealities is committed to contiuously improving its products, and making certain that its customers are satisfied, so please, feel free to send any inquiries or comments to **email: lentzk@vianet.on.ca**

Mailing Address:

MicroRealities Inc.
P.O. Box 2756
Sudbury, Ont.
CANADA
P3A 5J3

Registration

If you purchased the CosmoSaver-Solar System diskettes, then the registration code was already included on disk#1 and was entered in order to complete the installation successfully.   However, if you downloaded this product and would like to use it on a permanent basis, you can register it. Without registering, this product functions on a 10 day evaluation basis.   During this time, CosmoSaver is fully functionally functional.   But after the ten days are expired, the Explore mode is disabled,as well as the **Configure** and **Randomize** buttons, all of which can be accessed from the main CosmoSaver Configuration Dialog Box.   Also the Screen Saver Hot Keys are disabled.   Basically, after the evaluation period, the software will operate as a screen saver in its default settings, without the ability to configure the animations or explore the virtual planets. Because it is in its default settings, the screen saver will cycle through the same animations over and over again, just like most other screen savers.   But upon registration, all of the original capabilities will be restored, and all registration reminders will be turned off..You will also help support the development of future versions of this product and of new products.

The registration fee is $US14.95.   There is a $5.00 shipping and handling fee if you wish to receive the the product by mail on 3.5" diskettes.   The diskette version is functionally identical to the registered online version.   Upon registration, you will receive a registration code over email, or if you prefer, directly over the phone.   **VISA** and **MasterCard** are accepted for credit card payment.

Tel: 1-800-213-8802
Tel: 1-705-524-9331
Fax: 1-705-524-0820
Email: lentzk@vianet.on.ca

If you are outside North America, and wish to order by fax, or by mail, click here for a printable order form.   The conventional mail address is:

MicroRealities
P.O. Box 2756
Sudbury, Ont.
P3A 5J3
CANADA

Order Form For CosmoSaver-Solar System

Registration Fee: $US14.95.   To receive the product on 3.5" diskettes, there is an additional $US5.00 shipping and handling charge.   Print, fill out and fax order form with credit card info to MicroRealities at 1-705-524-0820.   Or enclose a cheque or money order and send to:

MicroRealities
P.O. Box 2756
Sudbury, Ont.
P3A 5J3
CANADA

Name: _____

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Turbo vs. Precision Rendering

Many planets such as Saturn and Jupiter are not perfect spheres.   Precison rendering takes this into account, and there is also a perspective effect where parallel lines seem to converge at a distance.   With Turbo rendering, all of the planets and sun are assumed to be perfect spheres, and there is no perspective effect, although the time taken to perform the rendering calculations is cut by two-thirds.

Render by Magnitude vs. Render by True Size

One of the classic problems in sky display software concerns how to display the moon.   The true size of the moon is one-half degree which amounts to a thumb width at arm's length.   If the monitor screen was 800 pixels across, and covered an area of 50 degrees out of the sky, the moon would be only eight pixels across, not leaving much opportunity to display surface detail, and not being much larger than the brightest stars.   Yet the full moon, being at magnitude -12, is 250,000 times brighter than the brightest star, so it should grab much more attention.

But when the moon is rendered according to its magnitude, the size of the moon's disc is calculated by same method as for the stars.. The moon's disc would now appear much wider than those of the background stars, and the because greater surface detail is visible, the view is more aesthetically pleasing.   The software includes this option, and it is on by default for all of the planets, satellites, and sun.

Menu Commands (Explore Mode)

Edit Menu

Copy
Copies the image to the clipboard

Date and Time (Screen Saver Hot Key 'D')
Opens the <u>Date and Time Dialog Box</u>.

Orientation (Screen Saver Hot Key 'O')
Opens the <u>Orientation Dialog Box</u>.

Distance (Screen Saver Hot Key 'Z')
Opens the <u>Distance Dialog Box</u>.

Lock Date
Clicking this means that the date displayed on the screen will be the date from which all animations start.

Preferences (Screen Saver Hot Key 'P')
Opens the <u>Preferences Dialog Box</u>.

Save Screen Saver Settings
Save the screen saver settings into the Registry for the current **Explore Mode** session.

Select Module

This menu selects which of the 12 modules is displayed.   See <u>CosmoSaver-Solar System Modules</u>.

View

Image (Screen Saver Hot Key 'F1')
Selects the <u>Image Animation Mode</u>.

Sky View (Screen Saver Hot Key 'F2')
Selects the <u>Sky View Animation Mode</u>.

Time Step (Screen Saver Hot Key 'F3')
Selects the <u>Time Step Animation Mode</u>.

Custom Orbit (Screen Saver Hot Key 'F4')
Selects the <u>Custom Orbit Animation Mode</u>.

Forward (Screen Saver Hot Key 'PAGE DOWN')
Moves the animation forward in time.

Single Step Toggle (Screen Saver Hot Key 'Pause|Break')
Toggles between single step mode, where user can single step through a frame and normal animation mode.   To actually single step, press the forward or reverse buttons.

Reverse (Screen Saver Hot Key 'PAGE UP')
Moves the animation backward in time.

Phase Toggle (Screen Saver Hot Key 'C')
Toggles between showing the phase of the planet and showing the planet completely illuminated.

Screen Saver Hot Keys

Screen saver hot keys allow control of the settings directly from the screen saver.

'D'   **Date and Time**
Opens the <u>Date and Time Dialog Box</u>.

'O'   **Orientation**
Opens the <u>Orientation Dialog Box</u>.

'Z'   **Distance**
Opens the <u>Distance Dialog Box</u>.

'P'   **Preferences**
Opens the <u>Preferences Dialog Box</u>.

'C'   **Phase toggle ('C' for 'Crescent')**
Toggles between showing a phase for the planet and the planet being fully illuminated.

'SPACE BAR' **Next Module**
Automatically skip to the next module.

'ALT + 0'   **Select Module**
Holding down the ALT key and pressing a number key allows one to choose a module. 0 is for the sun and 11 is for Pluto. See <u>CosmoSaver-Solar System Modules</u>.

'F1'   **Image**
Selects the <u>Image Animation Mode</u>.

'F2'   **Rotation Movie**
Selects the <u>Rotation Movie Animation Mode</u>.

'F3'   **Time Step**
Selects the <u>Time Step Animation Mode</u>.

'F4'   **Custom Orbit**
Selects the <u>Custom Orbit Animation Mode</u>.

'PAGE DOWN' **Forward**
Moves the animation forward in time.

'PAUSE | BREAK' **Single Step Toggle**
Toggles in and out of single step mode, where user can single step through

a frame and normal animation mode.   To actually single step, press the forward or reverse buttons.

'PAGE UP'   **Reverse**
Moves the animation backward in time.

Date and Time Dialog Box (Explore Mode::Edit|Date and Time)

Each module can be set for its own date and time.

Local Date and Time Fields
Local Date and Time can be entered in fields.   Whether or not it is Standard or Daylight Saving Time is automatically accounted for.   Also, the Julian Day field below will automatically be updated.

Julian Day Fields
The Julian Day can be entered into these fields.   The Local Date and Time fields above will automatically be updated.

Time Step Fields
Set the time step increment for the animations.

Orientation Dialog Box (Explore Mode::Edit|Orientation)

Latitude and Longitude Sliders
Adjusting these sliders determine the <u>Reference Latitude and Longitude</u> on which the planet or sun will be centered. **Pointing and clicking on the planet's surface will have the same effect, and is recommended.**

Reference Latitude and Longitude

Reference latitude and longitude are important to the screen saver animations.   They determine the location on the planet that is centered in **Image** animation mode.   They determine the location from which the sky is viewed in **Sky View** animation mode.   For **Time Step** animation mode, they set the location on the planet that is originally centered when the planet begins rotating.   For **Custom Orbit**, the animation begins centered on the closest possible point to the reference latitude and longitude.

The easiest way to set the reference latitude and longitude is to go to Explore Mode and choose the **Image** animation mode by clicking the ▦ icon.   If you move your mouse in the area of the main planet, the mouse will change from the customary arrow into a cross shape.   Whatever point you click on will be centered.   This location is the reference latitude and longitude.   It applies to all four of the animation modes, but is separate for every module.   If the point you want to center on is going through night time, you can use the phase toggle button, ◗, to improve your accuracy.

Another way to set the latitude and longitude is to access the Orientation Dialog Box from **Explore Mode** by clicking the ⊕ the icon, or accessing the Configure Dialog Box directly from the **CosmoSaver Main Window**.

Distance Dialog Box (Explore Mode::Edit|Distance)

Distance Slider
Adjusting this slider determines the distance from which the module is viewed.   There are two distance scales. This first scale has units in equatorial radii, except for Saturn, for which they are in outer ring radii.   The second has units in astronomical units (AU).   An astronomical unit is the mean distance between the earth and sun, which is about 92.7 million miles=149.6 million km. See the Solar System Table to gain an idea of AU distances.

Preferences Dialog Box (Explore Mode::Edit|Preferences)

Limiting Magnitude Slider
Controls the limiting magnitude of the background sky, that is what is the faintest star that can be seen in the background.   The higher the limiting magnitude, the fainter the stars that can be seen, and the more spectacular the view, but rendering takes longer.   See Magnitude Scales for an explanation of how magnitudes are used to measure star brightnesses.

Rendering Options
Turbo vs. Precision Rendering
Render by Magnitude vs. Render by True Size

Labelling Options
Setting these check boxes allow control of label planets, stars, and satellites

Custom Orbit Dialog Box

Orbit North Pole Latitude and Longitude Sliders
Adjusting these sliders determine the latitude and longitude co-ordinates of the custom orbit.

Farthest and Nearest Distance Sliders
Adjusting these sliders determine the nearest and farthest distance from the module object in equatorial radii for the custom orbit.   When you have a large difference between your farthest and nearest distances, you will sweep through your orbit much faster when you are close to the planet because of <u>Kepler's Second Law</u>.

Sky View Dialog Box

Altitude Slider
Control the altitude.   90 is overhead, 0 is parallel to the horizon, and -90 is looking straight down at the planet from the given elevation.

Azimuth Slider
Control the Azimuth.   0 means south, 90 is west, 180 is north, and 270 is east.

Elevation Slider
Controls the elevation in km.

With the proper combinations altitude,azimuth, and elevation, it is possible achieve scenic views of a slightly curved earth and stars moving in the background.   This can be done for all of the other planets.   The location where the sky is viewed from is set by the <u>Reference and Latitude and Longitude</u>.

Set Password Dialog Box

Type in the password you desire.   This password is the same for all Windows 95 screen savers. You do not need to know the previous password.

Get Password Dialog Box

Enter password into the edit control to exit screen saver.   If the password has been forgotten,
        there is no way to exit
the screen saver without powering down the system, not even by pressing CTRL-ALT-DELETE.
This is how Windows 95 handles screen saver passwords, and it is intended to provide security
for the user.   Once the user leaves his desk in an office setting, the screen saver prevents
indiscriminant access the computer.   However, the password can be changed without knowing
the previous password, and it is the same as for all the other Windows 95 screen savers (eg.
Flying Windows).   The Windows 3.1 screen savers each have separate passwords.

Kepler's Laws

Kepler's First Law-All planets move arround the sun in elliptical orbits.

Kepler's Second Law-A radius vector joining any planet sweeps out equal areas in equal times. This means that when a planet is close to the sun, it moves faster.   This is not too obvious in the program because most of the planet's orbits are too close to being circular.   But in <u>Custom Orbit Mode</u>, if you set your farthest distance to be a lot greater than the nearest distance, you will sweep though your orbit much quicker when your closest to the planet.   When the planet is far away, the stars are barely moving in the background because you are moving very slowly in your orbit.

Kepler's Third Law-The squares of the orbit periods of the planets are directly proportional to the mean distances.   This means that the farther a planet is from the sun, the longer it takes to orbit the sun.

Magnitudes

In astronomy, star brightnesses are measured by magnitudes.   The higher the magnitude of a star, the fainter it is.   When the magnitude of a star is one less than the magnitude of another, it is 2.512 times brighter.   The 6th magnitude is the faintest the unaided eye can see.   1st magnitude stars such as Antares, Deneb, or Betelgeux are 100 times brighter than these sixth magnitude stars because 2.512*2.512*2.512*2.512*2.512=100.   There are about 20 1st magnitude stars in the sky.   The brightest star, Sirius, is magnitude -1.   Jupiter can be as bright as magnitude -2, and Venus, the brightest planet, is magnitude -4.   The Full Moon is magnitude -12, and the Sun as seen from earth is magnitude -26, about 10 billion times brighter than Sirius. From the city, you can see as far as 4th magnitude, from a rural area, you can see fifth magnitude, and from the wilderness, you can see 6th magnitude.   CosmoSaver-Solar System allows you to see up to 8th magnitude.   Every increase in limiting magnitude dramatically increases the number of stars visible.   A bright star can seem faint because it is far from from earth.

Solar System Table

Name	Distance From Sun (AU)	Orbital Period (Years)	Equatorial Diameter (km)	Rotation Period
Sun			1392000	25-35
Mercury	0.387	0.241	4878	58.646
Venus	0.723	0.615	12104	58.646
Earth	1.000	1.000	12756	243.017
Mars	1.524	1.881	6787	0.9973
Jupiter	5.203	11.862	142800	1.0260
Saturn	9.539	29.461	120000	0.410
Uranus	19.182	84.014	51200	0.444
Neptune	30.058	164.792	48600	0.718
Pluto	39.439	247.691	2300	6.3867

Astronomical Fundamentals

Julian Day
Kepler's Laws
Magnitudes
Precession
Solar System Table

Precession

The moon's gravitational pull causes the earth's axis to wobble.   This wobbling happens over a 26,000 year period, and causes the Earth's pole star to change.   You can see this if you set the reference latitude to -90 so that the south pole is facing you.   This means that the North Pole is facing away from you and pointing toward the North Celestial Pole.   Now set the **Time Step Interval** to 25 years or more in the Date and Time Dialog Box and you will clearly see the pole star shift over the 26,000 years cycle.

Julian Day

The Julian Day is the number of days elapsed since Jan. 1, 4713 BC.   CosmoSaver sees this as -4712 because there were no such years as 0 AD or 0 DC.   The year before 1 AD was 1 BC.

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Things To Try

Once you are comfortable setting orientations, time intervals, and distances for the planets and sun, try these neat tricks.   These are best done in **Explore Mode** and saved to the Registry by pushing the ![button] button, so that these configurations will show up when the screen saver activates.

Inner Solar System
Choose the sun and go to Time Step mode.   Choose a time interval of one day and a distance of 4 AU to 5 AU.   You should see the the planets from Jupiter inwards orbiting the Sun with Mercury moving the fastest because it is closest to the sun.

Sunrise and Sunset
Go into Sky View mode and observe sunrises and sunsets for the earth.   For a sunset, choose a reference longitude that is just to the left of the terminator(the line between night and day).   You should see a blue sky getting darker as the sun sets.   Try it from different elevations.   Also, try this for Mars and you will see an orange sky turn dark.

Precession
Go to the earth, choose Time Step Mode, and a Reference Latitude near the South Pole, so that the North Celestial Pole is facing you.   Then choose a time interval of 25 years and see the pole stars change due to precession.

Martian Polar Caps Melting and Freezing
For Mars, enter Time Step mode and choose and time interval of 15 days.   Because the orbit is close to two years, you will notice the Polar Caps freeze and melt as Mars orbits the sun.

Saturn's Rings From Saturn
For Saturn, choose a reference latitude of 20 or so.   Then, go to Sky View mode and choose an azimuth of 0   You should see the Rings from the planet itself.