

# History, Myth and Culture

The Sun is a mass of fiery stone, a little larger than Greece.” Anaxagoras, 434 B.C.



# Stonehenge



*Photo is courtesy of Tom Sever*

- Huge stones and timbers laid out in a precisely arranged circle with marking stones in Southern England
- Built and remodeled by an ancient and unidentified culture from 3000 to 1600 B.C. This site must have been very important to them.
- This view from the center of Stonehenge shows the heel stone in the distance. On the summer solstice, the Sun would have risen at a point just above the heel stone, marking the most northerly position of the Sun on the horizon. On days following, the Sun would have risen progressively farther to the right of the heel stone.

# Stonehenge's solar orientation?



- Stonehenge may have been created to mark important astronomical dates in the calendar, such as the summer and winter equinox (solar events), but its real purpose remains a mystery

# Ancient Egypt

- Ancient Egyptians adopted the idea of the Sun as the center of everything and that stars moved because of the Earth's rotation
- They worshipped the Sun as the most powerful of their gods, Re, who was also creator of the world



# Mexican civilizations

- The Aztecs believed they were living in the fifth and last creation of the world. They called each creation a sun, because movement of the sun maintained human life.
- The central face in the “Calendar Stone” (right) seems to represent Tonatiuh, the Sun god
- The peoples of ancient Mesoamerica carefully observed the sky and used the calendar to predict solar and lunar eclipses, the cycles of Venus, the apparent movements of constellations and other celestial events. The calendar was developed by observing the Sun's motions over a long period of time.



*Aztec Sunstone*  
12 feet wide,  
weighs 24 tons

# Peru

- At Machu Picchu, high in the Andes Mountains in Peru, when the Sun rose through one specific window in a building called the Torreón (built around 1500), the Incan Indians knew that the dry season had begun (winter solstice in the southern hemisphere). This is how they began to develop a calendar.



# American Indian cultures

- The American Indian tribes observed the movements of the Sun and created drawings and rock arrangements to predict the seasons



*Bryan Bates*

Summer solstice at Crack'n Rock  
Ruins at Wupatki National Monument



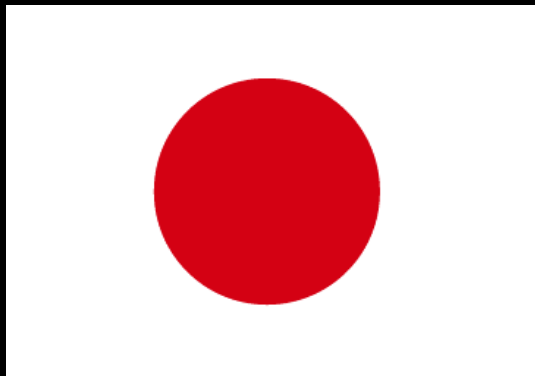
*Alan Spiegler*

A solar calendar near Jackrabbit  
ruins, near Homol'ovi State Park, AZ



# Japan

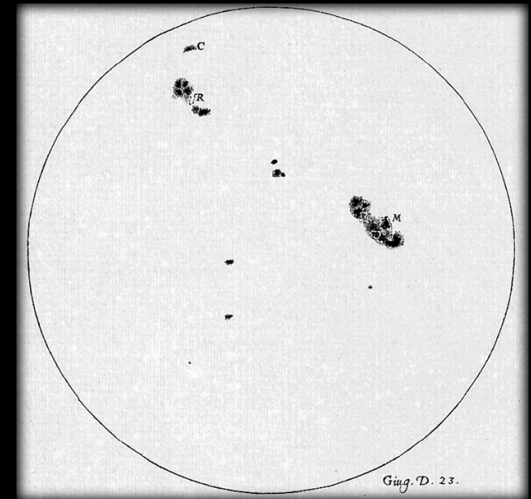
- According to ancient beliefs, the Japanese royal family is descended from their Sun goddess, Amaterasu. Even today, the Japanese maintain a most sacred Shinto shrine to the Sun at Ise City, with a 2,000 year history.
- And the Japanese national flag represents the disk of the sun.





# Early Western science

- **Aristotle (300 B.C.)** -- believed that the Earth was the center of the universe
- **Ptolemy (150 A.D.)** -- concluded that Earth was the center of the solar system; the planets revolved around it--this belief lasted through the Middle Ages
- **Copernicus (1500s)** -- the father of modern astronomy, first to proclaim that the Sun was at the center of the solar system, a major advance in astronomical thinking
- **Galileo (1600s)** -- agreed with Copernicus and was one of the first scientists to systematically observe and keep records of the Sun and sunspots. He correctly identified sunspots as part of the Sun and determined the Sun's rotation.

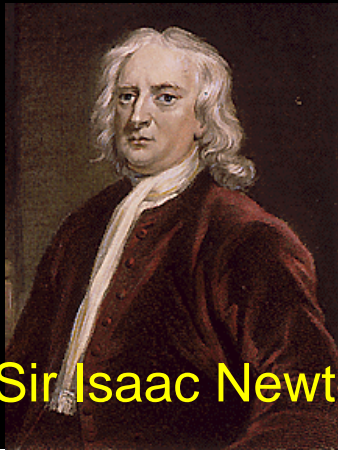


Video of some of the many sunspot drawings by Galileo

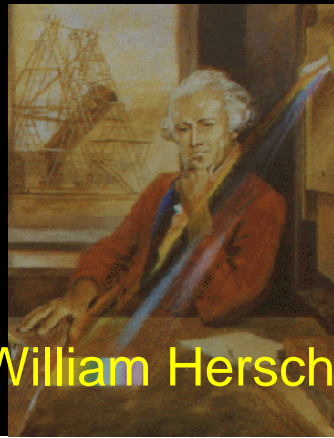


# More modern solar science

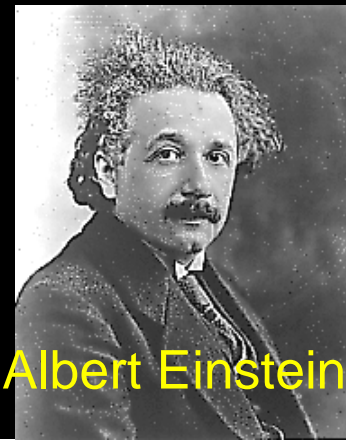
- **Sir Isaac Newton (late 1600s)** - concluded that stars were tremendously far away and that they gave light like the Sun
- **William Herschel ( 1780s)** - discovered the Sun's motion in space
- **Heinrich Schwabe (1843)** - determined the appearance of sunspot cycles
- **Robert Bunsen (1860s)** - invented the spectroscope to determine the elements found in the Sun
- **George Hale (1908)** - discovered the magnetic fields of sunspots
- **Albert Einstein (1920s)** - proposed that sunlight was made of particles. No one believed himself until it was proven 10 years later.



Sir Isaac Newton



William Herschel



Albert Einstein

