Umpqua Community College Morgan Observatory 2024

Real-time Observing programs (during School hours) at the observatory or online

Morgan Observatory Staff, Paul Morgan and Doug Pieschel will offer live images and narration to explain the images. Narration will include power point slides that can be used by teachers. Availability of some projects will be seasonal and all are weather dependent at the Observatories.

Solar Observing at PMO-- Time available 10 a.m. to 3:30 p.m. M-F (Weather permitting)

Grades 3-5

1) Images the sun to observe sunspots and prominences. 1 day

Grades 6-8

2) Image different layers of the sun's atmosphere and photosphere using special filters. Discuss the properties of the Chromosphere and Photosphere. Discuss the electromagnetic spectrum and the wavelength of light observed with the special filters. 1 day project

Grades 9-12 High School

3) Image the Sun to observe and quantify the changes in photosphere objects like sunspots. Discuss magnetism, solar magnetic fields and the creation of sunspots. 3 to 7 day project
4) Image Solar prominences to observe changes in these chromosphere objects. Discuss the nature of spicules, prominences, filaments, flares and coronal mass ejections. Discuss Space weather and interactions of the Solar wind and other particles impacting the earth from the Sun. 3 to 7 days.

Remote Telescope Observing-- Time available noon to 3:30 p.m. M-F (Weather permitting (Spring))

-- Time available 11 a.m. to 3:30 p.m. M-F (Weather permitting (Fall))

LUNAR

Grades 3-5

1) Lunar—Study the phases of the moon. Capture images of the moon on different dates to show the phases from waxing Crescent to Full Moon. Discuss visible changes and cause of phases. 4 to 10 day project
2) Lunar – Capture images of the moon during early waxing crescent phase to obtain images of earthshine. Discuss the causes of earth shine and the relation with earth weather. 1 day

Grades 6-8

3) Lunar- Lunar Observational History. Capture image of the moon to observe various lunar features including mountains, mare, craters, rays, and various so called "water features". Discuss what Galileo saw in 1609 with his telescope and how it contradicted Aristotle. Discuss the "water features" from seas, lakes, bays, and swamps and their true nature. Discuss how the features observed were formed. 1 day

Grades 9-12 High School

4) Lunar—Study the Apollo Landing sites with images captured when the lunar terminator is near each landing site. Discuss the terrain at the landing site and the science from the Apollo missions. 5-7 days.

SOLAR SYSTEM

Grades 6-8

5) Solar System- Capture images of the Sun, Moon, a planet, a dwarf planet, an asteroid and/or a comet. Discuss the features of each object, how are they similar and different. 1 or 2 days
6) Solar System- Capture an image of a Terrestrial planet (other than earth) and a gas or ice giant planet. Discuss the features of these classes of planets. 1 or 2 days

Grades 9-12 High School

7) Solar- Capture image of the Sun. Capture images of 2 stars of the same spectral class as the sun. Discuss stellar spectral class and the properties of each class. 1 day project
8) Solar System—Capture the images of a dwarf planet and/or an asteroid. Gather at least 3 images taken over a period of 14 days. Analyze the images to determine the position of the target dwarf planet and/or asteroid. Discuss how Pluto was discovered by Clyde Tombaugh or Ceres by Piazzi. Discuss the definition of a planet, dwarf planet and asteroid. 4 days over 2 weeks

MILKY WAY GALAXY

Grades 6-8

9) Milky Way Galaxy- Capture an image of a nebula, open star cluster and globular star cluster. Discuss how these objects are related and different. 1 day

Grades 9-12 High School

10) Milky Way Galaxy- Capture images of the following types of nebulae: Emission, Planetary, Reflection, Dark , and Super Nova Remnants. Discuss the feature of each type of nebula and origin. 1 to 3 days
11) Milky Way Galaxy-Capture images of “young” and “old” open star clusters, an open star cluster with a surrounding nebula, large and small diameter globular clusters. Discuss features of open and globular star cluster, origin, and longevity. 1-2 days
12) Milky Way Galaxy—Captures images of : a “hot Jupiter” exoplanet star, a multiple planetary system star, a star with a Super Earth. Discuss the discovery of exoplanets. Discuss the techniques to find exoplanets and properties of the exoplanets imaged. 1-3 days
13) Milky Way Galaxy- Capture images of stars of 4 different spectral class from O/B to M. Discuss the features of spectral classes of stars. 1-2 days
14) Milky Way Galaxy- Capture 4 images of stars on Main Sequence from Large Blue to Red Dwarf. Discuss properties of stars on the main sequence, similar and different.
15) Milky Way Galaxy- Capture images of 4 stars moving away from Main Sequence: Giant, Horizontal Branch, Short Period Variable (Instability Strip) Asymptotic Giant Branch (AGB), Super or Hyper giants stars. Discuss the evolution of sun-like mass stars as well as high mass stars. 1-2 days.
16) Milky Way Galaxy- Capture images 3 types of Variable Stars, Cepheid, RR Lyrae, and long period (Mira like). Discuss the features of variable stars, techniques to monitor/observe and the significance of the study of variable stars. 1-2 days

Other Galaxies

Grades 6-8

17) Other Galaxies – Capture images of a spiral, elliptical and irregular galaxy. Discuss the features of the types of galaxies and how they relate to the Milky Way Galaxy 1 day

Grades 9-12 High School

18) Other Galaxies- Capture images spiral galaxies, barred spiral, grand design spiral, flocculent spiral and a Seyfert spiral. Discuss the features of the various types of spiral galaxies and compare to the Milky Way Galaxy. 1-2 days
19) Other Galaxies- Capture images of an irregular galaxy, a dwarf elliptical and large elliptical galaxy, and a lenticular galaxy. Discuss the features of the various types of galaxies and compare to the Milky Way Galaxy. 1-2 days
20) Other Galaxies—Capture images of members of our Local Group of Galaxies. An irregular galaxy in the Local Group and a large spiral galaxy in the Local Group. Discuss the definition and features of the Local Group of Galaxies 1-2 days
21) Other Galaxies -Capture 3 images of galaxies in collision. Discuss the future collision of the Milky Way Galaxy and Andromeda Galaxy. 1-2 days
22) Other Galaxies- Capture images of 2 active galaxies with one a quasar. Discuss the types of active galaxies and the discovery of quasars 1- 2 days
23) Other Galaxies- Capture images of 3 galaxies imaged by Vera Rubin and her findings about galaxy rotation. Discuss Vera Rubin's findings and the discovery of "Dark Matter". 1-3 days
24) Other Galaxies- Capture images of 4 galaxies imaged by Vesto Slipher, Milton Humason and Alan Sandage to produce data for Hubble's Law. Discuss techniques used to gather data, the results and the significance of the data found. Discuss Hubble's Law and the current controversy. 2-4 days
25) Other—Capture images of the moon, sun, distant planet or dwarf planet, 61 Cygni, star cluster or nebula more than 10,000 light years away, a galaxy less than 5 million light years away, a galaxy 65 million light years away and a galaxy more than a billion light years away. Discuss the process of measuring astronomical distances. Discuss the techniques to measure the distance to the first star accurately measured as well as nearby galaxies and distant galaxies. 2 to 5 days