

McDonald Observatory Student Field Experience Program and Activity Descriptions for Grades 9-12

Grades 9-12: Highlights of McDonald Observatory (Up to 80 students)

McDonald Observatory is a world-renowned scientific research facility, with state-of-the-art telescopes and instrumentation. Students will explore how scientists use our facility by touring one of our research telescopes, observing the Sun and learning about the technique of spectroscopy.

2.7m Harlan J. Smith Telescope Tour: The tour visits one of the largest telescopes at McDonald Observatory, where students can see first-hand how engineering and technology come together to make scientific discovery possible. (Although rare, due to unforeseen technical issues we may be forced to alter or cancel this portion of your program.)

Format: Inquiry-based Guided Tour

Our Star the Sun: Students conduct safe, live observations of the Sun, viewing features such as sunspots, solar prominences and flares in real time. Using specially filtered telescopes fitted with video cameras, students will observe features such as sunspots, solar prominences and solar flares. Demos and/or activities will help students understand solar features and the apparent motion of the Sun across the sky.

Format: Classroom/Theater Presentation, Hands-On Activity

Explore Spectroscopy: The most productive tool in the astronomer's toolbox is spectroscopy. Students will build their own spectroscope using classroom materials and analyze different kinds of light to demonstrate how astronomers are able to learn about distant objects in the Universe. Format: Classroom/Theater Presentation, Hands-On Activity

Grades 9-12: Frontiers (Up to 60 students)

The hunt for planets beyond our Solar System and the drive to understand the mysterious expansion of the Universe are two of the most fascinating and cutting-edge areas of astronomy today. Students will explore these topics and visit one of the largest telescopes in the world, the Hobby-Eberly Telescope.

Hobby-Eberly Telescope Tour: The tour visits the 10-meter Hobby-Eberly Telescope, where some of the most cutting-edge science in the world is taking place. Students will see the telescope from the visitor's gallery, which includes a number of hands-on, interactive exhibits. (Although rare, due to unforeseen technical issues we may be forced to alter or cancel this portion of your program.)

Format: Inquiry-based Guided Tour

The Expanding Universe: This classroom-based activity models the expansion of the Universe using students to play the role of galaxies. Students will conduct observations to derive Hubble's Law for their model Universe, calculate its expansion rate and determine its age.

Format: Classroom/Theater Presentation, Hands-On Activity

Exoplanets: This classroom-based activity demonstrates how astronomers detect and explore planets around stars other than the Sun. Students will then have the opportunity to explore a mystery planet using a variety of ground- and space-based techniques.

Format: Classroom/Theater Presentation, Hands-On Activity

Grades 9-12: Tools of the Astronomer (Up to 80 students)

Astronomers rely on technology, engineering and favorable conditions in order to explore the Universe. This package features three important features of the astronomer's toolbox: a telescope, a spectroscope and darkness.

2.7m Harlan J. Smith Telescope Tour: The tour visits one of the largest telescopes at McDonald Observatory, where students can see first-hand how engineering and technology come together to make scientific discovery possible. (Although rare, due to unforeseen technical issues we may be forced to alter or cancel this portion of your program.)

Format: Inquiry-based Guided Tour

Explore Spectroscopy: The most productive tool in the astronomer's toolbox is spectroscopy. Students will build their own spectroscope using classroom materials and analyze different kinds of light to demonstrate how astronomers are able to learn about distant objects in the Universe.

Format: Classroom/Theater Presentation, Hands-On Activity

Preserving Dark Skies: The dark night sky is a dwindling resource upon which astronomers rely in order to do their work. Students will learn about the effects of light pollution and the simple, cost-effective ways to combat it.

Format: Classroom/Theater Presentation, Hands-On Activity

Grades 9-12: HETDEX (Up to 80 students)

The Hobby-Eberly Telescope Dark Energy Experiment is happening right now at McDonald Observatory. Students will learn about the mysterious expanding Universe and how astronomers at McDonald are working to better understand it.

Hobby-Eberly Telescope Tour: The tour visits the 10 m Hobby-Eberly Telescope, where some of the most cutting-edge science in the world is taking place. Students will see the telescope from the visitor's gallery, which includes a number of hands-on, interactive exhibits. (Although rare, due to unforeseen technical issues we may be forced to alter or cancel this portion of your program.)

Format: Inquiry-based Guided Tour

Explore Spectroscopy: The most productive tool in the astronomer's toolbox is spectroscopy. Students will build their own spectroscope using classroom materials, and analyze different kinds of light to demonstrate how astronomers are able to learn about distant objects in the Universe.

Format: Classroom/Theater Presentation, Hands-On Activity

The Expanding Universe: This classroom-based activity models the expansion of the Universe using students to play the role of galaxies. Students will conduct observations to derive Hubble's Law for their model Universe, calculate its expansion rate and determine its age.

Format: Classroom/Theater Presentation, Hands-On Activity