



## White House Astronomy Night Activities and Exhibits

Attendees of the White House Astronomy Night will explore telescopes and a number of exciting STEM education activities and exhibits on the South Lawn of the White House, including:

### **Observing the Night Sky**

Eighteen telescopes and two pairs of binoculars will be available for viewing the night sky. Participants will be guided through observations of a set of celestial objects, including the Moon, Neptune, the Andromeda galaxy, and Albireo (a binary star system where the two stars are noticeably different colors) by astronomy experts. There will be a wide variety of telescopes to illustrate the different kinds of technologies that can be used to make astronomical observations, as well as low-tech options such as binoculars to show participants what they can do in their own backyard.

### **Featured Conversation with MythBusters**

Astronomy Night attendees will hear from the stars of Discovery's MythBusters, Jamie Hyneman and Adam Savage. The Mythbusters will share their experiences using science, engineering, and mathematics to test out theories and will answer questions from the attendees and from those submitted via Twitter (#AstronomyNight).

### **Astronomy and Space Activities**

#### Explore Spacecraft Technology and Build-Your-Own Satellite

NASA's Small Spacecraft Technology Program develops and demonstrates new capabilities of small spacecraft for science, exploration and space operations. NASA will have presenters on hand to talk about the small satellite technologies and upcoming missions along with a hands-on opportunity for participants to build their own real-size small satellite.

#### Mars Rocks and Touch a Real Moon Rock!

Smithsonian Curator, Dr. Tim McCoy, will feature out of this world meteorites, including a sample originating from Mars. NASA experts will showcase rocks found on Earth that are similar to those that NASA's Mars Rover Curiosity has observed at Gale Crater on Mars. Students can also touch one of the few touchable lunar samples in the world, collected by the only scientist to walk on the Moon, Dr. Harrison Schmitt, during Apollo 17 in 1972. For the visually impaired, Moon and Mars materials will be available in Braille and tactile formats.

### Exploring the Solar System under a Dome

By standing up a portable planetarium, the Lunar and Planetary Institute (Universities Space Research Association) will immerse students in the excitement of astronomy. Under the dome, students will explore the vastness of our incredible solar system and hear captivating stories, as told by Native American Master Storytellers, that examine the mysteries of our universe.

### Talk to an Astronaut

In a conversation with NASA Commercial Crew Astronauts, students will learn first-hand about astronaut training and be able to ask questions of the four astronauts selected by NASA to be the first to fly to space on commercial carriers.

### Using Stars to Navigate the Seas

Jenna Ishii, an educator and apprentice navigator from the Polynesian Voyaging Society, will share with students how Polynesians generations ago learned to navigate across vast expanses of open ocean using astronomy and other natural cues to find the way. She will share a brief recorded message from a senior crew member currently on a worldwide voyage in the voyaging canoe Hokulea and show a model of the canoe and a small replica of the Hawaiian star compass used in traditional Polynesian celestial navigation.

### Astronomy across the Spectrum

Ground-based astronomy comes in many “colors.” Today’s astronomers use all of the colors of visible light, and the invisible light of other wavelengths as well – radio waves, infrared, and ultraviolet– to learn as much as we can about our present universe, how it formed, and how it will change. The U.S. National Science Foundation, with colleagues from its funded observatories – Gemini Observatory, the National Radio Astronomy Observatory, and the National Optical Astronomy Observatory – will provide hands-on activities to show Astronomy Night participants how this multi-wavelength approach to astronomy allows us to investigate new planets, asteroids, comets black holes, exploding stars, and the births of new galaxies.

### Coding the Solar System

Sphero is bringing the solar system to life with app-controlled robots orbiting the sun. Participants can get hands-on and play with Sphero and learn to program along the way.

### Walking on Mars

Participants will be able to experience what it might be like to be on Mars through a 360-degree panorama in virtual reality, using Oculus Rift technology. This is part of a broader initiative in which NASA is using virtual reality to democratize the experience of space exploration and scientific discovery in an effort to create new tools to impact STEM education.

## **Space and Exploration Exhibits**

### **Observing the Distant Corners of the Universe: The James Webb Space Telescope**

Ball Aerospace will be exhibiting several different models of the James Webb Space Telescope (JWST). When launched in 2018, JWST will observe the distant reaches of the cosmos, answering questions about the first stars and galaxies in our universe. Its findings will motivate the next generation to discover and explore and reach beyond the Earth. Ball designed the optical system for JWST and will also bring a full-size mirror segment for students to examine.

### **Ferrying Astronauts to Orbit: The Starliner Spacecraft**

Boeing is currently developing the CST-100 Starliner to transport up to seven NASA astronauts to and from the International Space Station. The company will be showing students a model of the Starliner that it uses to test the spacecraft's aerodynamic characteristics in advanced wind tunnels.

### **Watching the Sun and Monitoring Space Weather: The Solar Dynamics Observatory and IRIS Explorer**

The space-based Solar Dynamics Observatory, built by Lockheed Martin, has taken more than 100 million images of the sun since 2010. Ultra-high definition video of the Observatory's extraordinary view of the sun will also be shown on a big-screen TV as an example of cutting-edge astronomy in action. Lockheed Martin will provide a model of the Interface Region Imaging Spectrograph (IRIS) explorer, a satellite that traces the flow of energy and plasma between the Sun and Earth.

### **Growing Fresh Food in Space: VEGGIE**

Earlier this year, NASA astronauts made news by eating the first lettuce grown entirely in space. The system that provided that fresh meal was the Vegetable Production System (VEGGIE). Developed by ORBITEC, a subsidiary of Sierra Nevada Corporation, VEGGIE grows plants and provides the International Space Station crew with a palatable, nutritious, and safe source of fresh food. In the challenging environment on board the ISS, VEGGIE provides the necessary lighting and nutrient delivery for efficient plant growth.

### **3-D Printing Advanced Spacecraft Thrusters: The SuperDraco Engine**

SpaceX will be showing off its SuperDraco engine, a 3D-printed thruster used on the company's Crew Dragon spacecraft. A cargo version of Dragon made history in 2012 when it became the first commercial spacecraft in history to deliver cargo to the International Space Station and safely return cargo to Earth. NASA and SpaceX plan to use the Dragon spacecraft to ferry astronauts to the International Space Station starting in 2017.