SCIENCE FESTIVAL™
Presented by THE BIOGEN FOUNDATION
STATEWIDE STAR PARTY

TIPS FOR HOSTING A SUCCESSFUL SKYWATCHING SESSION

Anyone Out There?

http://www.ncsciencefestival.org/starparty/

SUGGESTED MATERIALS

- Telescopes
- Binoculars
- Table
- Star charts
- Trimmed red balloons (to cover white flashlights)
- Activity materials
- Red lights
- Orange traffic cones
- First-aid kit
- Stepstool (as an aid while viewing)
- Green laser

ACTIVITY IDEAS

- Preview what you expect to see in the sky and teach how to use star charts.
- Viewing through telescopes and binoculars
- Star party kit activities
- Storytelling
- Sky tour (see "Anyone Out There?" below)

SETTING UP YOUR SITE

- Choose a viewing area away from unshielded lights. Turn off outdoor lights where possible.
- Shield the viewing area from headlights. Traffic cones can help you block off areas from parking.
- Consider marking telescopes and tripods with glow-in-the dark tape, red lights, or red glow sticks.
- Mark the path to the viewing area with red light, glow sticks, or solar lights. Or escort visitors with a red flashlight.
- Have a small "orientation" table marked with red light that has star charts, trimmed red balloons, and activity materials.
- Offer a sky tour (see "Anyone Out There?" below) and other activities away from the telescopes to help spread out crowds.

GETTING THE MOST OF THE VIEWING EXPERIENCE

If possible, gather groups as they arrive for a briefing so they will feel comfortable and safe, know what to expect, and help protect equipment.

- Ask for no white light in the telescope viewing area from flashlights, cellphones, or flash photos. Pass out trimmed red balloons to cover white flashlights and cellphone lights.
- Explain other rules, e.g., no smoking, alcohol, running, or pets.
- Let people know where to find the telescopes, how many there are, and what kinds of objects they'll see. You may want to introduce the telescope operators.
- Ask visitors to touch the telescope only with permission. If telescope operators have a chair or stepstool, they can use a red light to direct visitors to "put your hands on the stool to steady yourself" and then (aiming the light at the eyepiece) "look here."
- Parents with young children should look through the telescope *before* their children do. Then they'll be in a better position to help their child.
- Visitors who wear glasses should try looking first with glasses on.
- Encourage visitors to ask questions and to speak up if they don't see anything. Telescope operators should give visitors meaningful information (say "This is the Orion Nebula, a place where stars are forming" rather than just "This is M42").

USING A GREEN LASER?

Green lasers can damage eyesight and cause problems for aircraft. Be mindful of safety:

- Use only lasers <5 milliwatts.
- Choose a laser that requires you to continuously depress the button to operate it. Use the laser sparingly.
- Keep the laser on a lanyard around your neck or otherwise attached to yourself. Don't let anyone else touch the laser.
- Never point a green laser near a person, vehicle, wildlife, reflective material (such as a road sign) or aircraft—even if it seems to be at a great distance.
- Avoid aiming the laser close to the horizon.
- Circle any object in the sky that you are not absolutely positive is a star, rather than holding the laser on it—in case the "star" is actually an airplane.

SKY TOUR: "ANYONE OUT THERE?"

Below is a suggested sky tour for April 20-21, 2018 that pairs well with 2018 Star Party kit activities. Practice in advance with the April "Where are The Distant Worlds" star map, keeping in mind that the stars rise and set a few minutes earlier each night.

1) Introduction

Is there life anywhere besides Earth? We can consider this question while touring tonight's sky.

2) Getting oriented

You can figure out which direction is which by using the Big Dipper to find the North Star. In the April evening sky, look high in the north for the 7 bright stars of the Big Dipper. The two stars at the far side of the bowl serve as pointers to the North Star. Start from the bottom star of the bowl, go through the top star, and keep going, drawing an imaginary line that's roughly four to five times the distance between the pointer stars.

The first reasonably bright star you'll run into is Polaris, the North Star. If your sky is dark enough, you can also see that Polaris is the tip of the handle of the Little Dipper.

Is there alien life near Polaris? If so, they can look for a message from Earth. In 2008, NASA sent the Beatles' song "Across the Universe" in the direction of this star. Polaris is so far away that even traveling at the speed of light, this message won't reach it for hundreds of years. Learn more at https://www.nasa.gov/topics/universe/features/across_universe.html

3) Planets and moons

The brightest object you'll see in the night sky on April 20-21, 2018 is the waxing crescent Moon. If you're out early enough and with a good view to the west, look for the very bright planet Venus. If you're out later in the evening, with a good view to the east, look for Jupiter, which rises about an hour and a half after sunset during the 2018 Star Party.

NASA's Juno spacecraft has been orbiting Jupiter to learn about its origin and evolution, thus improving our understanding of our solar system's beginnings and of planetary systems around other stars. As of this writing, the mission was expected to last until at least July 2018. At the end of the mission, the spacecraft will be crashed into Jupiter so as not to risk contaminating any potentially habitable moon of Jupiter with Earth microbes that may have hitched a ride. Learn more about the Juno mission at https://www.jpl.nasa.gov/missions/juno/

Of particular interest is Jupiter's moon Europa, which is visible through an amateur telescope. Europa appears to have a deep liquid water ocean under its icy surface and may have the right conditions for life. Learn more about the prospects for life on ocean worlds at https://www.nasa.gov/specials/ocean-worlds/

4) Stars and exoplanets

Soon after dark, look for Sirius, the brightest star in the night sky. On April 20-21 evenings, it appears in the southwest. In another 296,000 years the neighborhood of Sirius will receive a visitor from Earth, NASA's Voyager 2 spacecraft. Both Voyager spacecraft have onboard a Golden Record with sounds and images from Earth, for the benefit of any alien spacefarers that may find the spacecraft in the distant future. Learn more about the Voyager mission at https://voyager.jpl.nasa.gov/

It's not just our star, the Sun, that has planets. Other stars can have planets, too – called "exoplanets." Within the constellation Gemini the Twins, the bright star Pollux (seen as the head of one of the twins) is known to have an exoplanet. There's also at least one exoplanet around Gamma Leonis (aka Algieba), which lies in the mane of Leo the Lion.

For more examples of exoplanets, see the "Where are the Distant Worlds" star map and the Kepler star wheel. Learn more about exoplanets at https://exoplanets.nasa.gov/

5) Deep-sky objects

We humans regularly send radio and television signals into outer space accidentally. In 1974, the Arecibo radio telescope in Puerto Rico was used to intentionally send a message toward M13, a globular star cluster in the constellation Hercules that can be seen with the unaided eye if you have sharp eyesight and a very dark sky. Learn more about this mostly ceremonial attempt to communicate with any extraterrestrials at https://www.seti.org/seti-institute/project/details/arecibo-message

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