



## STATEWIDE STAR PARTY

# TIPS FOR HOSTING A SUCCESSFUL SKYWATCHING SESSION

## *Star Light, Star Bright*

<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 “Lives of Stars” 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 “Lives of Stars” 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: “LIVES OF STARS”

Below is a suggested sky tour for teaching your visitors about the lives of stars, using the April early evening sky. Practice in advance with your Star Chart, keeping in mind that the stars rise and set a few minutes earlier each night. Because a few of the objects below are already low in the west at nightfall by the dates of the 2017 Star Party, you'll need to schedule your tour for right after dark and find a location with a fairly unobstructed view to the west.

This particular sky tour pairs well with other 2017 Star Party kit activities, especially Celestial Treasure Hunt (have visitors mark on their handout what they see on your sky tour and through the telescopes), Observing Cards, Nuclear Fusion, Let's Make a Supernova, and the Lives of Stars kinesthetic activities. For a primer about the life cycle of stars, refer to the Lives of Stars handout, <https://nightsky.jpl.nasa.gov/docs/13lifecycleshandout.pdf>

### 1) Introduction

Stars “live” much longer than humans do. Stars like our sun live for billions of years. More massive stars live for millions of years. But in just a single evening, we can observe a star's entire life cycle by finding examples of stars in different stages of their lives.

### 2) Stellar nursery

Just after nightfall in April, find the constellation Orion the Hunter low in the west by looking for three bright stars in a row that form Orion's belt. Do you see the sword hanging from the belt? The fuzzy middle “star” in the sword is actually the Orion Nebula (also known as Messier 42, or M42), a cloud of gas and dust where stars are being born.

### 3) Young stars

Draw an imaginary line from Orion's belt to the right (westward) until you reach the orange star Aldebaran, which is part of a “V” shape representing the face of Taurus the Bull. The other stars in the V are the Hyades, an *open cluster*. These relatively young stars formed together and still travel in a pack.

Other examples of open star clusters include the Pleiades (M45), over the bull's back; and the Beehive cluster (M44), between the bright stars Pollux and Regulus.

Look high in the northern April evening sky for the Big Dipper. Five of its seven bright stars are part of the Ursa Major Moving Cluster, a group of loosely bound stars moving together in space that may have once been an open cluster.

### 4) Elderly stars

Stars like our sun become *red giants* in their old age. Examples include Aldebaran and Arcturus. To find Arcturus, follow the arc of the handle of the Big Dipper.

A massive star becomes a *red supergiant* in old age. Orion's reddish shoulder Betelgeuse is an example.

### 5) Star graveyards

A star like our sun ends its life by ejecting its outer layers in a big weight-loss diet (called, confusingly, a *planetary nebula*). What remains of the star's core slowly cools off as a *white dwarf*. The Eskimo Nebula (NGC 2392), in the constellation Gemini, is an example of a planetary nebula.

A star much more massive than the Sun ends its life as a *supernova*. Near the tip of one of Taurus's horns lies a supernova remnant, the Crab Nebula (M1). You'll need a telescope now to see the glowing remains, but when the supernova explosion was witnessed in the year 1054, it was so bright it was seen for weeks in the daytime!

The remaining core of the Crab Nebula is a *neutron star*. If the remaining core after a supernova is massive enough, it instead becomes a *black hole*. By definition, you won't be able to see this, but there's an example of a stellar-mass black hole just east of Orion's belt: V616 Monocerotis (muh NAH ser OH tiss).

### 6) Conclusion

Supernova explosions scatter new chemical elements into space, where they eventually are recycled into new stars and planets. Our planet and all of us are literally made of star stuff.



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