



# Cedar Breaks National Monument

## Master Astronomer Program



### Fall 2017 Workshop Information

All of us at Cedar Breaks National Monument are excited that you have chosen to be a part of our Master Astronomer Program! This document contains detailed information about the program and the logistics for the Fall 2017 workshop. If you have questions after reading this document, please contact Zach Schierl at [zachary\\_schierl@nps.gov](mailto:zachary_schierl@nps.gov) or 435-586-9451 x 4429

#### What is the Master Astronomer Program?

The Master Astronomer Program is a 40-hour workshop for citizens to learn more about astronomy, stargazing, how to use telescopes, and protecting the dark skies of Southern Utah. The program is modeled after the successful “Master Gardener” and “Master Naturalist” programs taught across the country. Participants will develop a greater understanding of and appreciation for the night sky and astronomy through a series of fun, hands-on, interactive workshops on:

- The night sky and astronomy (stars, planets, constellations, galaxies, star lore, etc)
- Learning how to use backyard telescopes
- Protecting dark skies in Southern Utah and beyond
- Educating and communicating with the public about astronomy and dark sky preservation

Once trained, “Master Astronomers” will continue their education by using their knowledge and skills to educate the public about astronomy and dark skies protection at locations around Southern Utah. Participants will receive training in communication and effective teaching techniques, and be given numerous opportunities to practice sharing their knowledge with a general audience. Please note that volunteer service is **not** a mandatory requirement to participate in the program. Some may choose to participate simply for their education and not the “Master Astronomer” certification.

#### Who can become a Master Astronomer?

Just about anyone! We welcome teachers & educators, amateur astronomers, lifelong learners, science fanatics, park naturalists, civic leaders, city planners, and anyone who is curious to learn more about the night sky! Interested college or high school students are also welcome. The program is targeted at those with little or no previous astronomy experience. If you are an advanced amateur astronomer, you may find that much of the content is already familiar, but we still welcome your participation.

#### What will the Master Astronomer workshops be like?

The Master Astronomer program is not simply a series of lectures by astronomy experts. The workshops will revolve around hands-on, multimodal learning activities which not only promote, but **require**, active participation by attendees. If you are not interested in being an active participant, this program is NOT for you! Pedagogical research has shown active learning promotes retention, understanding, and appreciation of the topic being taught. Workshops will frequently be held outside in the field.

#### What’s in it for me?

By becoming a Master Astronomer, you will:

- Develop a greater understanding of and appreciation for the night sky and our place in the universe.
- Gain the skills and knowledge needed to serve as an ambassador of the night sky and astronomy

- Become a member of a strong and continually growing community in Southern Utah that is passionate about the night sky, and committed to preserving it for future generations.
- Learn communication and teaching techniques that can be applied to many other aspects of your life.

## **Logistics:**

**Total workshop length:** 40 hours

**Registration fee:** \$75 (*covers cost of materials and uniforms*)

If the registration fee is a barrier to your participation, please contact us. Scholarships may be available.

**Cancellation/refund policy:** The registration fee is refundable if you cancel at least one month prior to the start of the workshop. After this, no refunds will be given.

**Enrollment cap:** Each section (Cedar City and Hurricane) of the Master Astronomer class will be capped at 15 participants to ensure a quality experience for all.

**Service requirement:** In order to become a certified Master Astronomer, participants must contribute at least 10 hours of volunteer service educating southern Utah audiences about astronomy and/or dark sky preservation within one year of workshop completion, and in each subsequent year that they wish to remain in the program. Participants must also attend at least one continuing education workshop (2-3 hours) offered by the Master Astronomer program each year to remain in the program.

**Please note that you are welcome to take the course without completing the volunteer component!** We welcome those who simply desire to learn more about the night sky and astronomy, but don't want/don't have time to complete the volunteer service component. At the end of the course, you will receive a certificate showing that you completed the workshop. However, the "Master Astronomer" title is reserved for those who commit to using the knowledge gained during the program to educate others in Southern Utah about the night sky and astronomy via continued volunteer service.

**Meeting times & locations:** The Master Astronomer program will meet weekly from mid-September through mid-November. Pending sufficient enrollment, two sections will be offered. You may attend whichever location is most convenient for you:

- **Hurricane/St. George:** Tuesday nights, 6:00-8:30 pm (Hurricane Community Center)
- **Cedar City:** Wednesday nights, 6:00-8:30 pm (Southern Utah University PE Building)

There will be **four Saturday evening sessions** scattered throughout the program. These are necessary in order to have enough time outside under the stars to become familiar with constellations and how to use a telescope, without staying up too late on weeknights. These sessions will take place at various locations around southwestern Utah. Exact locations depend on weather and moon conditions.

**See below for a complete program schedule. Please note that as astronomers, we are ultimately at the whims of the weather and some modifications to the schedule may be necessary!**

## **Your Instructors**

**Leesa Ricci** started out in astronomy attending the Stansbury Park Observing Complex (SPOC) meetings when she was a teenager. They had a dark sky ordinance, so it was really easy to get some great views out there. Later, as a student at Southern Utah University, she started taking astronomy and physics classes and was eventually hired as a lab tech at the Ashcroft Observatory where she worked for 6 years. In 2015, she became the president of the Southern Utah Space Foundation (SUSF) whose primary purpose is astronomy outreach and education. In March 2016, she joined the dark skies team at Cedar Breaks National Monument to help develop and launch the Master Astronomer Program.

**Zach Schierl** grew up in the world's first International Dark Sky City (Flagstaff, Arizona) and has been an astronomy nerd since receiving a 4.5" telescope for his 10th birthday. Since then, he has upgraded to a 10" telescope, earned a B.S. in geology and astronomy from Whitman College, and a M.S. in geology with an emphasis in earth science education from Western Washington University. After six years of suffering under the perpetually cloudy and rainy skies of the Pacific NW, Zach & his wife moved to the clear but light polluted skies of Colorado's Front Range where he taught high school and community college geology and astronomy courses before moving to Southern Utah. Zach has also worked as an astronomy educator and dark skies advocate at Lowell Observatory, Bryce Canyon National Park, and Black Canyon of the Gunnison National Park. He is now the Education Specialist and Dark Skies Coordinator at Cedar Breaks National Monument and ecstatic to once again be living in close proximity to clear, dark skies.

## **Frequently Asked Questions:**

### ***What happens if I miss a class?***

We realize that this workshop is a major time commitment and that life happens. In order to “pass” the class, you cannot miss more than two sessions. Information from missed workshops will be provided in print or other formats for you to catch up. You will still be responsible for material covered during any missed sessions, and may be asked to demonstrate your knowledge of it in some way. **We highly recommend that you do not miss any of the Saturday evening sessions** as it will be very difficult to get caught up on the skills that will be covered during them. If you are interested in participating, but concerned about your ability to attend the required number of classes, please contact us to discuss possible options.

### ***Will there be any exams?***

There will not be an exam. Assessments will be primarily informal. Participants will be evaluated based on participation and their ability to demonstrate that they have mastered the skills taught in the class (e.g., operating a telescope, pointing out constellations, etc.) At the end of the course, participants will host a star party that is open to the public. Full participation in this event is required. Participants will also be required to give short presentations on various topics over the course of the workshop. The instructors reserve the right to deny a completion certificate to those who do not fully participate in all activities, exhibit little command of the material, and/or who have missed more than two sessions.

### ***How about math?***

We'll try to keep the math to a minimum. Basic multiplication and division is required to do things like calculate the magnification of a telescope or estimate the distance to a star, but that's about as deep into the math as we'll get here. No complex algebra or calculus, we promise! If you **are** looking to delve deeply into the mathematics that govern the Universe, you should seek an introductory university physics or astronomy class.

### ***What else should I know?***

Much of the workshop will take place outside under the stars. Especially towards the end of the program, it may be cold and/or windy. For each workshop session, you should come prepared to be outside for at least part of the class period. “I didn't bring enough layers!” is not an acceptable excuse for not participating in an activity!

# Fall 2017 Master Astronomer Schedule

Hurricane Section		Cedar City Section			
Date/Time:	Location:	Date/Time:	Location:	<u>Tentative Topics:</u>	Moon Phase
<b>Tue, 9/12</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 9/13</b> <b>6:00-8:30 pm</b>	SUU PE Building	Introductions Light & Light Pollution	3rd Quarter
<b>Sat, 9/16</b> <b>8:00-11:00</b>		Cedar Breaks National Monument Ranger Station		Introduction to Telescopes Cosmic Cast of Characters	Waning crescent
<b>Tue, 9/19</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 9/20</b> <b>6:00-8:30 pm</b>	SUU PE Building	Celestial Motions Observatories	New
<b>Tue, 9/26</b> <b>6:00-9:30 pm</b>	Hurricane Community Center	<b>Wed, 9/27</b> <b>6:00-9:30 pm</b>	SUU PE Building	Archaeoastronomy & History of Astronomy Using a telescope	1st Quarter
<b>Tue, 10/3</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 10/4</b> <b>6:00-8:30 pm</b>	SUU PE Building	Why Protect the Night Sky? Solar System	Full
<b>Tue, 10/10</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 10/11</b> <b>6:00-8:30 pm</b>	SUU PE Building	Solar System Stars	3rd Quarter
<b>Sat 10/14</b> <b>6:30-9:30</b>		TBD: Dark Sky Site		Scale of the Universe Using a telescope Measuring light pollution	Waning crescent
<b>Tue, 10/17</b> <b>6:00-9:30 pm</b>	Hurricane Community Center	<b>Wed, 10/18</b> <b>6:00-9:30 pm</b>	SUU PE Building	Dark sky friendly lighting & tour	New

	Center				
<b>Sat, 10/21</b> <b>7:00-10:00</b>			TBD: Dark Sky Site	Using a telescope Measuring light pollution	New
<b>Tue, 10/24</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 10/25</b> <b>6:00-8:30 pm</b>	SUU PE Building	Extrasolar planets Using a telescope	Waxing crescent
<b>Tue, 10/31</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 11/1</b> <b>6:00-8:30 pm</b>	SUU PE Building	Beginnings Using a telescope	Waxing gibbous
<b>Tue, 11/7</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 11/8</b> <b>6:00-8:30 pm</b>	SUU PE Building	<i>TBD</i> <i>Make-up day</i>	Waning gibbous
<b>Sat, 11/11</b> <b>5:00-9:00 pm</b>			TBD	Public Star Party led by Master Astronomers	3rd quarter
<b>Tue, 11/14</b> <b>6:00-8:30 pm</b>	Hurricane Community Center	<b>Wed, 11/15</b> <b>6:00-8:30 pm</b>	SUU PE Building	Star party debrief Volunteer Opportunities & Next Steps	Waning crescent
<b><i>Ongoing topics:</i></b>				Constellations Communicating astronomy to the public	