STAR (Sharing Telescopes and Astronomy Resources) PROGRAM

Overview

Cornerstones of Science

Cornerstones of Science works with libraries to create experiences of science that spark curiosity and foster a deeper connection to the world around us.

Through Cornerstones' STAR (Sharing Telescopes and Astronomical Resources) Program, patrons can check out a telescope as they would a book. The telescope and supporting materials allow them to explore the night sky with family and friends, discovering the wonders of astronomy first-hand.

We invite you to visit the Cornerstones website at **www.cornerstonesofscience.org** for more information on the programs, supports and services they offer to your public library.

The STAR (Sharing Telescopes and Astronomical Resources) Program

The **STAR** (Sharing Telescopes and Astronomy Resources) **Program** is designed to foster curiosity and deepen interest in astronomy and the night skies by providing quality telescopes and "hands-on" training to public libraries for use in science programs and for lending to patrons. The STAR Program provides ongoing opportunities for the public to make first-hand scientific observations. The program was initiated in 2012 and is now in over 40 public libraries around Maine, Massachusetts, North Carolina, Arizona, and Texas. This program is based on a successful program implemented by the New Hampshire Astronomical Society **http://nhastro.com/ltp.php**

Southern Maine Astronomers (SMA)

Southern Maine Astronomers (SMA) has partnered with Cornerstones, on the STAR Program, since the beginning, in February 2012. SMA members have volunteered to modify telescopes, train library staff, serve as STAR Program *Liaisons* to the libraries with telescopes, assisting with the basic maintenance and operation. For more information about SMA, visit **www.southernmaineastronomer.org**

Thomaston Public Library

Cornerstones of Science generously donated a modified Orion StarBlast Telescope to Thomaston Public Library in honor of their board member Rudi Graf for his efforts in creating public access to science experiences. Thomaston Public Library wholeheartedly embraces this mission and is grateful to Cornerstones of Science and Mr. Graf for their donation and their services.

BORROWING AGREEMENT

The ASTRONOMY DISCOVERY KIT (includes telescope) can only be borrowed by adults age 18 and over. Borrowers must have a Thomaston Public Library Membership with their account in good standing. They are intended for patrons to be used outside of the library. Children under 18 must be supervised by an adult while using the telescope. The loan period is for 2 weeks with no renewals**. If the telescope is not returned within one week of its due date, patron will be charged the full replacement costs.** Kits are examined upon check-out and check-in, and the borrower will be charged a replacement cost for any missing or damaged items.

TELESCOPE BORROWING AGREEMENT

Name _____ Library Card No.: _____

- I understand that the ASTRONOMY DISCOVERY KIT (includes telescope) can only be checked out by a member of the Thomaston Public Library who is 18 years or older and in good standing. (Patron must present a valid Maine driver's license or government issued ID.)
- Children under 18 must be supervised by an adult while using the telescope.
- RETURN: I understand that the DISCOVERY KIT must be returned directly to Staff at the desk.
- TRANSPORT: I understand that the telescope must be transported in a vehicle and secured with a seatbelt.
- LOAN PERIOD: I understand that the loan period is for 2 weeks with no renewals. If the telescope is not returned within one week of its due date, I will be charged the full replacement costs detailed below.
- LIABILITY: I accept full responsibility for the telescope and accessories while checked out to me including liability for repair costs if the telescope is damaged and liability for replacement costs if the telescope is lost or stolen while checked out to me.
- Any costs incurred will be added to my library record and all privileges to borrow library materials will be suspended until the debt is paid in full to the Thomaston Public Library.

Replacement Costs

- Telescope, finder, lens, eyepiece $355
- Accessory Pack (headlamp, instruction manual, constellation pocket guide) $31.95
- Books & Resources in Discovery Kit Backpack $167.80

CAUTION - DO NOT LOOK AT THE SUN WHILE USING THE TELESCOPE; DOING THIS CAN BLIND THE USER. THE LIBRARY IS NOT RESPONSIBLE FOR ANY DAMAGE A PATRON INFLICTS UPON ONESELF OR THE TELESCOPE.

Initial here _____*

I received from the Library staff:

- A demonstration how to carry the telescope safely.
- A demonstration how to travel with telescope safely in my car.
- A demonstration how to turn the finder on & off, using the finder to locate an object.
- A demonstration on viewing and focusing the telescope.
- The ASTRONOMY DISCOVERY KIT backpack of resources and the telescope.

Date Borrowed _____

Borrower's Signature _____

Maine State Driver's License No. _____

Library Staff Signature _____

Date Returned _____ Received by_____

ASTRONOMY DISCOVERY KIT

Included in this Astronomy Discovery Kit:

(Please note that the backpack of resources must be borrowed along with the telescope.)

1. Orion 4.5" Starblast Telescope (modified), $355.00
2. Accessory Pack, $31.95 (Fanny pack attached to the telescope) which includes:
   a. Instruction Manual, $10.00
   b. Headlamp, $10.00
   c. National Audubon Society Pocket Guide: Constellations, $11.95

Inside the Astronomy Discovery Kit Backpack:

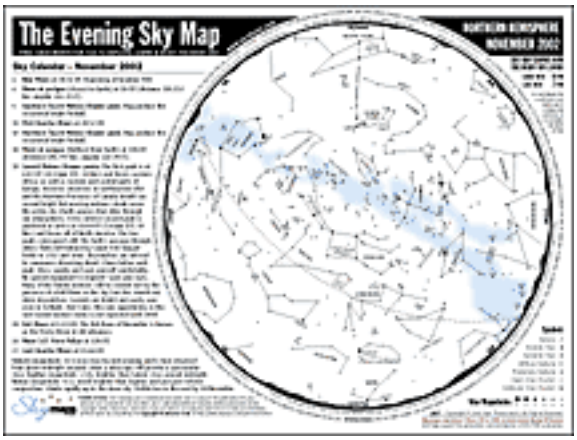
3. STAR Program Manual $10.00
4. Sky Map (In back pocket inside the Manual. Be sure it is for the current month) Patron may keep. $0.00
5. The Night Sky Planisphere 40° - 50° Star Finder, $14.99
6. What Do Black Holes Eat for Dinner? And Other Silly, Yet Totally Smart, Questions About Space by Dr. Grant Tremblay and Katie Coppens, $16.95
7. How Long Do Stars Last? By Emily Hudd, $27.99
8. Astronomy (DK / Eyewitness Books) by Kristen Lippincott, $19.99
9. The Secret Galaxy by Fran Hodgkins, photographs by Mike Taylor, $16.95
10. Universe (DK / Eyewitness Books) by Robin Kerrod, $19.99
11. 365 Starry Nights by Chet Raymo, $21.95
12. The Mighty Mars Rovers: The Incredible Adventures of Spirit and Opportunity by Elizabeth Rusch. $18.99

Total value of Astronomy Discovery Kit: $554.75

SKY MAP

The best resource we can provide you is a monthly sky map. A current sky map should be in the back of the STAR Program Manual, or you can download and print a “Sky Map” or star chart, for the current month at www.skymaps.com

The Evening Sky Map



The Evening Sky Map (PDF) is a 2-page monthly guide to the night sky suitable for all sky watchers including newcomers to Astronomy.

On page one of the Sky Map, there is information on both positions of stars, constellations, planets, and other celestial objects as well as the period of time they will be visible in the night sky.

Page two describes objects easily seen with the naked eye (in a dark location) with binoculars and with a telescope.

Steps to use the chart:

1. Face NORTH and find the Big Dipper, Ursa Major. It may appear to be upside down. If you rotate the chart and place your thumb over NORTH, you can match the constellations in the NORTH sky with those on the chart.
2. If you face SOUTH, rotate the chart so SOUTH is at the bottom and place your thumb over SOUTH. Do the same for EAST and WEST. This orients you to the sky and constellations for the month. The sky image changes every night but it is more noticeable monthly.
3. The blue colored area (or light gray on a black-and-white print out) on the chart represents the Milky Way. In a dark sky area, you can see millions of stars that make up the Milky Way, giving the appearance of spilled milk.

STAR Gazing 101

How to Look at the Night Skies

There are so many different celestial objects to look at year-round. Here are basic steps and tools to get you started. Learning the constellations and finding them in the night sky at different times of the year is a good start. There are three ways you can observe the night skies:

By using your eyes: Practice finding constellations and understanding how to navigate around night sky using and a monthly chart, such as the Sky Map. A Planisphere will do the same thing by dialing in the date and time to see what will be visible at that time.

By binoculars: Binoculars allow a person to see, more clearly, some of those deep sky "fuzzies" you've identified on the Sky Map such as Galaxies, Clusters, and other Messier Objects. A pair of binoculars will pull them in closer and provide a bit more detail. Some objects are best seen through binoculars as they are quite large and will fill the field of view. However, binoculars will limit the field of view that may make finding the objects more difficult to locate, unless you are familiar with the night sky.

Your binoculars magnification should be at least 7x50. Try lying on your back with your arms close to your side in order to hold the binoculars steady.

By telescope: A telescope will bring celestial objects even closer. There is nothing more magical than the ability to see rings of Saturn or Jupiter's Great Red Spot with your own eyes! However the field of view will be even further restricted and locating objects will be more difficult, unless you know where to look. Also you may have misconceptions as to what they "think" they will see when using a telescope. Here are some of the most common ones:

- Many are familiar with amazing photographs from the Hubble Telescope. Remember the images from Hubble or the telescope boxes or magazines are hours long exposures with special color filters. The objects you can see will be black and white. The receptors in your eyes, called cones, do not function at night and you cannot see colors. You can see some brightly colored stars and some color on the planets but not Nebulae or Galaxies. Do not be shocked or think that the telescope is not working properly.
- The celestial objects you see through the telescope, will not appear very large. The planets will NOT look as large as the moon as some have been led to believe. If you ever have an opportunity to visit an observatory with a very large telescope, you may be fortunate to see some of these objects, larger than you would in a backyard telescope and it would be worth the trip.

Helpful Hints and Telescope Etiquette

- For best viewing of stars, constellations, planets, the Milky Way and other celestial objects, the site should be located in an area where there are no lights to dilute the visibility.
- Set up your telescope during the day (when you can see) on a small sturdy table.
- **Do not set up the telescope outside if inclement weather is predicted**.
- Use the red lamp on headlamp to navigate to telescope and read charts. Regular flashlights are useful, but their white light may be too bright. Use red cellophane, held on with a rubber band, over the lens. Use the white light for cleaning up.
- It can take 15-20 minutes for your eyes to adapt to the darkness.
- The red dot on the EZ finder is an LED light, not a laser.
- Don't touch the eyepiece. Find the focuser knob and adjust it to your particular vision.
- Don't put your finger on any optics.
- Start at the lowest magnification (21) and gradually increase.
- Images will be upside down and flipped.

The Best Time for Moon Viewing

Many people might assume it is when the Moon is at full phase, but that's probably the worst time to look at it. When the Moon is full it tends to be dazzlingly bright as well as flat and one-dimensional in appearance.

In contrast, the interval when the Moon is at or just past First Quarter phase, or at or just before Last Quarter phase, is when we get the best views of the lunar landscape right along the sunrise-sunset line.

ADDITIONAL RESOURCES

Astronomy Clubs

There are a number of Astronomy Clubs in Maine. The closest to our area is the Central Maine Astronomers (Mid-coast and Central Maine) maineastro.com

Planetariums

There are several planetariums around the state of Maine. Please visit their websites and/or call if you are interested in attending a show:

- Bates College Planetarium, Lewiston www.bates.edu/physics-astronomy/astronomy
- Francis Malcolm Science Center, Easton www.francismalcolmsciencecenter.com
- Fred R. Dingley Planetarium, Lee Academy, Lee
- Emera Astronomy Center (formerly Maynard F. Jordan Planetarium) Univ. of Maine, Orono astro.umaine.edu
- Northern Stars Planetarium, Fairfield www.northern-stars.com
- Southworth Planetarium, Univ. of Southern Maine, Portland usm.maine.edu/planet
- Kennaday Planetarium, Maine Maritime Academy, Castine
- Planetarium Troy Central School, RSU #3, Troy

Roadtrip!

Explore the universe in Aroostook County with the Maine Solar System Model. The 40-mile scale model stretches from Houlton to Presque Isle.

Astronomy-Related Events

- Globe at Night – A simple and valuable citizen monitoring program with the goal of measuring light pollution around the globe. No telescope required; participants step out into their yards and using a simple star chart, identify how many stars they can see in the ORION constellation. The participant enters their basic information and the data becomes part of a global database. www.globeatnight.org
- Acadia Night Sky Festival – Held in late September, on Mount Desert Island and Acadia National Park. Lectures, workshops, art exhibits, and science related programs. Nightly star parties www.acadianightskyfestival.com

Software and Apps

- **Stellarium –** A free open source planetarium for your computer. It shows realistic sky in 3D, just like what you see with the naked eye, binoculars, or a telescope. www.stellarium.org
- **SkyView Lite**: Free stargazing app
  - Android https://tinyurl.com/y23pwj5x
  - iPhone https://tinyurl.com/ypjnfkn8
- **Star Chart** – Free stargazing app
  - Android: https://tinyurl.com/2wfbkynj
  - iPhone: https://tinyurl.com/mvhhjc87

- **Star Walk** – Move around the sky with your gyro capable devices and learn the night sky, even on a cloudy night.
  - iPhone: https://tinyurl.com/s25mx9xz
  - Android: https://tinyurl.com/94ce2jjz

(Please note some apps offer in-app purchases for premium versions and may have limited capability for the free versions.)

Websites

- **Amazing Space** (for kids & teachers) Online explorations to get to know our vast universe by exploring its planets, galaxies, comets, black holes, and more. **http://amazing-space.stsci.edu/**
- **American Museum of Natural History – Astronomy** (for kids) Online educational exhibit for kids. **http://www.amnh.org/explore/ology/astronomy**
- **NASA** (for all ages) What can I say? It's NASA! **http://science.nasa.gov**
- **The Hubble Site: Explore Astronomy** (for all ages) This site relies heavily on animations, interactive Java applets, movie clips, images, and podcasts to explore topics in astronomy. **http://hubblesite.org/explore_astronomy**
- **Moon Phases Calendar** This moon phases calendar tool or moon schedule is an easy way to find out the lunar phase for any given month. **http://www.moonconnection.com/moon_phases_calendar.phtml**
- **Heavens Above** Satellite tracking. Find out when the next visible pass of the International Space Station, ISS and others will pass overhead at your location. **http://www.heavens-above.com**
- **Sky Map** Star chart for the current month **www.skymaps.com**

RETURNING THE DISCOVERY KIT

Please return the Astronomy Discover Kit Backpack and telescope to someone at the Library Desk.

Staff will:

- Turn on the telescope EZ finder and confirm that the light turns on.
- Check the condition of the mirror: look down the barrel. Is it still whole and unbroken?
- Verify all parts are present and accounted for:
  - Telescope and two lens caps
  - Viewing lens (on side of barrel)
  - Pouch
  - Laminated user guide
  - Headlamp that has working batteries
  - Astronomy Discovery Kit Backpack (check that all resources are inside)
- Check in (scan) as a book.
- Retrieve Telescope Borrowing Agreement from back of Library Procedures binder. Staff should sign to acknowledge that all parts are returned and in good working order and date of return.