



## For Colorado Teachers

America's Best Idea – The National Parks Mission: <http://www.nps.gov/legacy/mission.html>

*"...to promote and regulate the use of the...national parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

[National Park Service Organic Act, 16 U.S.C.1.](#)

The National Parks are not just pretty places to go to, they are capsules of the American experience. Our scenery, culture, history and natural habitats are preserved public resources that are not just to enjoy but to educate as well. It is to this end that every park strives to also educate the public about the protection of our shared resources. Colorado houses some of the park service's finest examples and offers many online resources for teachers and students.

**Views of the National Parks (Views)** is a multimedia education program that presents the natural, historical, and cultural wonders associated with national parks and provides opportunities for all Americans to discover why national parks are special places. This website has excellent curriculum located in the Teacher's Lounge section.

<http://www.nature.nps.gov/views/layouts/Main.html#/Views/>

### **National Parks in Colorado Websites**

Park websites have additional subject web links on the left hand side for topics of: History & Culture, Nature & Science, For Teachers, and For Students.

Here is a selection to get you exploring National Parks in Colorado:

<http://www.nps.gov/state/CO/>

**Bent's Old Fort National Historic Site** (has traveling trunks available):

<http://www.nps.gov/beol/forteachers/index.htm>

**Black Canyon of the Gunnison National Park:**

<http://www.nps.gov/blca/forteachers/index.htm>

Or <http://www.nps.gov/blca/forteachers/curriculummaterials.htm>

**Colorado National Monument:** <http://www.nps.gov/colm/naturescience/index.htm>

**Curecanti National Recreation Area:** <http://www.nps.gov/cure/forteachers/index.htm>

**Dinosaur National Monument:** <http://www.nps.gov/dino/forteachers/index.htm>

**Florissant Fossil Beds National Monument:**

<http://www.nps.gov/flfo/naturescience/index.htm>

**Hovenweep National Monument:** <http://www.nps.gov/hove/forteachers/index.htm>



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Great Sand Dunes National Monument:

<http://www.nps.gov/grsa/naturescience/index.htm>

Mesa Verde National Park: <http://www.nps.gov/meve/naturescience/index.htm>

Rocky Mountain National Park: <http://www.nps.gov/romo/naturescience/index.htm> And  
<http://www.nps.gov/romo/forteachers/index.htm>

Sand Creek Massacre National Historic Site:

<http://www.nps.gov/sand/naturescience/index.htm>

Yucca House National Monument: <http://www.nps.gov/yuho/historyculture/index.htm>

Colorado is also home to one of the most influential rivers in the development of water laws in the nation, called the Cache La Poudre National River Corridor (<http://www.nps.gov/cala/index.htm>). Also Colorado has 4 National Trails that run through the state: California, Old Spanish, Pony Express, and the Santa Fe.

All four-corner area parks that have ancestral pueblo ruins can relate to archaeoastronomy. The subject of archaeoastronomy for the NPS basically begins at Chaco Cultural National Historic Site in New Mexico. Their website partners are by far the best NPS site for the subject matter: <http://www.exploratorium.edu/chaco/HTML/teacher.html> and NASA's partner website: <http://sunearthday.nasa.gov/2005/educators/index.htm> or their Flash® website: <http://www.exploratorium.edu/chaco/index.html>

### **National Park Service Offices in Northern Colorado**

The National Park Service has over 390 properties under its jurisdiction. National programs help the parks tap into the best research and information available to help them manage and protect its natural resources. Many of these national programs have offices in Denver and Fort Collins. See the latest in park science at their web sites:

NPS NRSS (Natural Resource Stewardship & Science):

<http://www.nature.nps.gov/index.cfm>

NPS Natural Sounds & Night Skies Division: [http://www.nature.nps.gov/sounds\\_night](http://www.nature.nps.gov/sounds_night)

To see which NPS parks participate in astronomy education programs go to:

<http://www.nightskyparks.org/events>

Jr. Ranger Night Explorer booklets are available for mailing directly to your class before a park visit. Contact: [Teresa.Jiles@colostate.edu](mailto:Teresa.Jiles@colostate.edu)

For Natural Sounds Activities go to: <http://www.nature.nps.gov/sound/teaching.cfm>

NPS Air Resources Division (the Highlights box on the right side has links for curriculum): <http://www.nature.nps.gov/air/edu/index.cfm>

NPS Climate Change Response Program: <http://www.nps.gov/climatechange/>



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NPS Biological Resources: <http://www.nature.nps.gov/biology/>

NPS Geologic Resources: <http://www.nature.nps.gov/geology/index.cfm>

NPS Water Website (good links): <http://www.nature.nps.gov/water/interp.cfm>

### For Students

Web Rangers: [http://www.webrangers.us/entry\\_gate.cfm](http://www.webrangers.us/entry_gate.cfm) For Dark Sky Web Ranger Activity: <http://www.webrangers.us/activities/darksky?id=30>

Junior Rangers (ages 5-12): Many parks have their own unique park oriented Junior Ranger Activity Booklet. Many can be downloaded by park web site:

<http://www.nps.gov/learn/juniorranger.cfm>

For example here's the link for Rocky Mtn. NP Jr. Ranger Book – there's a Spanish translation too: <http://www.nps.gov/romo/forkids/beajuniorranger.htm>

### More NPS Sites For Teachers

NPS Curriculum Page: <http://www.nps.gov/learn/curriculum.htm>

Teachers in the Parks Program: <http://www.nps.gov/learn/trt/>

The NPS Digital Image Archive: <http://photo.itc.nps.gov/storage/images/index.html>

The NPS Volunteers In The Parks Program:

<http://www.nps.gov/getinvolved/volunteer.htm>

### Astronomy and Night Sky Resources

Night Sky Parks: <http://www.nightskyparks.org>

Night at the Parks: <http://www.darks skiesawareness.org/night-in-park.php>

Many parks have astronomy and evening sky programs. The training of volunteers and Park Rangers in how to develop these Ranger-led programs is often directed through a national office called the Night Skies Program, which is housed in Fort Collins and partners with Colorado State University.

Some parks work extensively with local amateur astronomy clubs for public stargazing with their telescopes. School groups are invited to attend these stargazing events in the parks. If you would like to set up an evening specifically for your class, contact your local club. If you would like to combine a stargazing evening with camping at a national park, group camping at parks can easily accommodate your class overnight trip.

The following links are many of the non-NPS sites that the Night Skies Program suggests to our Rangers and volunteers to prepare their own evening sky programs and events. Please feel free to contact Teresa Jiles at NPS Night Skies Program for more advice on how to set up your own special evening stargazing event, by phone: (970) 267-2183 or by Email:

[Teresa.Jiles@colostate.edu](mailto:Teresa.Jiles@colostate.edu)

### Astronomy and Dark Sky Outreach - Who Are We

National Park Service Night Skies Program: <http://www.nature.nps.gov/night>

NPS Night Sky Program Light Pollution Research Methods:

[www.georgewright.org/184duriscoe.pdf](http://www.georgewright.org/184duriscoe.pdf)



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NPS Night Skies Program Astronomy Volunteer In the Parks Program:

<http://www.nature.nps.gov/night/volunteer.cfm>

NPS Night Skies Program Podcasts:

*The Tradition of Looking Up:* <http://365daysofastronomy.org/2009/03/20/march>

*The Good, The Bad and The Ugly of Outdoor Lighting:*

<http://365daysofastronomy.org/2009/04/25/april-25th-the-good-the-bad-and-the-ugly-of-outdoor-lighting/>

*The Scenery of the Night:* <http://365daysofastronomy.org/2009/08/25/august-25th-the-scenery-of-the-night/>

Night Sky Presentation at IDA Meeting 2009 (what you can see in a dark natural sky):

<http://docs.darksky.org/AGM/2009/Duriscoe.pdf>

NPS Web Rangers: (look for the “Disappearing Dark Sky” online children’s activity):

<http://www.nps.gov/webrangers/> or try the old link at:

<http://www.webrangers.us/activities/darksky/?id=30>

### The Sun and Space Weather

NPS Annular Eclipse & Transit of Venus Website:

<http://www.nature.nps.gov/features/eclipse/index.cfm>

NASA Eclipse Website: <http://eclipse.gsfc.nasa.gov/eclipse.html>

Eclipse eyewear: <http://www.rainbowsymphony.com/eclipse-glasses.html>

SOHO Space Weather monitoring web page:

<http://sohowww.nascom.nasa.gov/spaceweather/>

NOAA National Weather Service Updates: <http://www.weather.gov/>

Strike Alert II Personal lightning detector:

<http://www.ambientweather.com/stpelide.html>

EPA Sun Wise Sun Safety Program:

[http://www.epa.gov/sunwise/educator\\_resources.html](http://www.epa.gov/sunwise/educator_resources.html)

And UV Index: <http://www.epa.gov/sunwise/uvindex.html>

### Tonight’s Sky Resources

Make a Star Finder: <http://spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml>

Print A Sky Map: <http://www.skymaps.com/downloads.html>

Constellation Stories (Greek): <http://comfychair.org/~cmbell/myth/myth.html>

Sun and Moon Data: <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/rs-one-day-us>



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*Tonight's Sky*: [http://amazing-space.stsci.edu/tonights\\_sky/](http://amazing-space.stsci.edu/tonights_sky/)

StarDate: <http://stardate.org/>

What's Up: <http://www.sciencecenter.net/whatsup/09/feature.htm>

WikiSky: <http://www.wikisky.org/>

The Clear Sky Clock: <http://www.cleardarksky.com/csk/>

Google Sky: <http://www.google.com/sky/>

Moon Phases: <http://tycho.usno.navy.mil/vphase.html>

Google Moon: <http://www.google.com/moon/>

Aurora forecast links: <http://www.geo.mtu.edu/weather/aurora/>

Astronomy Picture of the Day - Good APOD links for of hard to find sky phenomena:

Gegenschein image: <http://antwrp.gsfc.nasa.gov/apod/ap061226.html>

Noctilucent Cloud image: <http://antwrp.gsfc.nasa.gov/apod/ap990726.html>

Zodiacal Light image: <http://antwrp.gsfc.nasa.gov/apod/ap081214.html>

### **Educator's Resources**

Traditions of The Sun Ancient Solar Observatories: <http://www.traditionsofthesun.org/>

NASA & NPS Partnership: <http://www.earthtosky.org/>

NASA Solar System Exploration Website: <http://solarsystem.nasa.gov/index.cfm>

NASA Night Sky Network: <http://nightsky.jpl.nasa.gov/>

SOHO Sun Classroom – great sun diagrams:

<http://sohowww.nascom.nasa.gov/classroom/classroom.html>

The Space Science Institute (SSI) is a nonprofit

[http://www.spacescience.org/education/instructional\\_materials.html](http://www.spacescience.org/education/instructional_materials.html)

Amazing images from Hubble Space Telescope: <http://hubblesite.org/>

Great images and video clips:

<http://www.spitzer.caltech.edu/Media/mediaimages/jpl.shtml>

Good teaching tools: <http://amazing-space.stsci.edu/eds/>

International Year of Astronomy web links: <http://365daysofastronomy.org/> ;

<http://www.astronomy2009.org/> ; <http://astronomy2009.us/>

Galileo In The Classroom: <http://www.site.galileoteachers.org/>

Telescope History: <http://amazing-space.stsci.edu/resources/explorations/groundup/>

PBS on 400 Years of the Telescope:

[http://www.pbs.org/soptv/400years/the\\_film/overview.php](http://www.pbs.org/soptv/400years/the_film/overview.php)



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The Sun Song: <http://kids.niehs.nih.gov/lyrics/whysunshine.htm> or at :  
[http://www.learninggamesforkids.com/science\\_songs/educational\\_videos\\_sun\\_song.html](http://www.learninggamesforkids.com/science_songs/educational_videos_sun_song.html)

They Might Be Giants The Sun Song music video:  
[http://tmbw.net/wiki/Why\\_Does\\_The\\_Sun\\_Shine](http://tmbw.net/wiki/Why_Does_The_Sun_Shine) Or got to it directly on YouTube:  
<http://www.youtube.com/watch?v=Zbgul1NpEA8&fmt=18>

The Dark Skies Rangers (Excellent source for Light Pollution activities):  
<http://www.darks skiesawareness.org/DarkSkiesRangers/>

The Galileoscope: <https://www.galileoscope.org/gs/>

One Planet: <http://www.oneplaneteducation.com/canyons/>

NASA Astromaterials & NASA Astrobiology (relate park +life+ environment and compare with what we know about our own solar system):  
<http://ares.jsc.nasa.gov/ares/education/abouteducation.cfm>

Astrobiology in Yellowstone: <http://astrobiology.nasa.gov/nai/education-and-outreach/products-and-resources/invisible-yellowstone/> Also see:  
<http://www.nps.gov/yell/planyourvisit/resourceandissues.htm>

NASA Planetquest (exoplanets, but excellent educator links):  
<http://planetquest.jpl.nasa.gov/>

NASA CORE (good hands on exploration activities):  
<http://education.nasa.gov/edprograms/core/home/index.html>

NASA Educator (everything NASA):  
<http://www.nasa.gov/audience/foreducators/index.html>

Paper Plate Light Pollution Activity: <http://analyzer.depaul.edu/paperplate/lights.htm>

IDA Teacher Resources Website (includes impact to wildlife habitat activity):  
<http://www.darks sky.org/mc/page.do?sitePageId=90127>

Nocturnal Animal Lesson: <http://www.enchantedlearning.com/coloring/nocturnal.shtml>

Teacher Tube: <http://www.teachertube.com/>

### Online Astronomy Magazines

Astronomy Magazine: <http://www.astronomy.com>

Sky & Telescope: <http://www.skyandtelescope.com/>

### Amateur Astronomer Clubs

Most astronomy clubs have an education outreach staff to bring astronomy to schools, museums and other public venues. Your school does not need a telescope to experience the use of one. Many amateurs donate their time and telescopes to use for classroom



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activities and school stargazing events. To find an astronomy club near you, please visit these websites:

NCAS – Northern Colorado Astronomical Society (Friday night observing at Rocky Mountain NP): <http://www.ncastro.org/>

NASA Night Sky Network: <http://nightsky.jpl.nasa.gov/>

The Night Sky Network Club Finder: <http://nightsky.jpl.nasa.gov/club-map.cfm>

Sky & Telescope Magazine Club Finder:  
<http://www.skyandtelescope.com/community/organizations>

Astronomy Magazine Club Finder: <http://www.astronomy.com/asy/community/groups/>

### Lighting Technologies for Dark Sky Friendly Parks

IDA Manufacturers Directory: <http://www.darksky.org/mc/page.do?sitePageId=56423>

IDA Light Pollution Info Sheets: <http://www.darksky.org/mc/page.do?sitePageId=58823>

How to upgrade dusk-to dawn lighting nightmares: <http://evluma.com/>

Guidance Lighting Suggestions: TraxEyes: <http://www.traxeyes.co.uk/index.html>

IDA White Paper on Blue LED Lighting: [http://docs.darksky.org/Reports/IDA\\_Blue-Rich\\_Light\\_White\\_Paper051710.pdf](http://docs.darksky.org/Reports/IDA_Blue-Rich_Light_White_Paper051710.pdf)

IDA Educator Resources: <http://www.darksky.org/education>

National Geographic Article on Light Pollution:  
[http://ngm.nationalgeographic.com/geopedia/Light\\_Pollution#Light%20Pollution](http://ngm.nationalgeographic.com/geopedia/Light_Pollution#Light%20Pollution)

Starry Night Lights: <http://www.starrynightlights.com/>

NOTE: The NPS Night Skies Program espouses the following mitigations for outdoor lighting. These mitigation steps should be performed in order, from top to bottom, to provide the most effective solution.

- 1) Warranting- Light only WHERE you need it
- 2) Controls- Light only WHEN you need it
- 3) Shielding- Direct light DOWNWARD
- 4) Spectrum- Select lamp COLOR that minimize negative impacts
- 5) Intensity- Use the minimum AMOUNT of light necessary
- 6) Efficiency- Select the most energy EFFICACIOUS lamp and fixture