This rippling aurora was captured by photographer Don Rice in Fairbanks, Alaska.

As presented here, it is intended for educational use only.

The Geophysical Institute maintains a telephone aurora forecast at (907) 474-7558. Or check the Online Aurora Forecast - updated each day by 3 PM Alaska Time. Valid for that night and the following two nights, it is a service of the University of Alaska, Fairbanks Geophysical Institute.

Auroral displays follow intense sunspot activities, which are expected to reach the peak of their 11-year cycle variation in the year 2001 or 2002.

Northern Lights; the Aurora Borealis

Summer tourists won't have much chance of seeing the famous Aurora Borealis, the dancing fluorescent ribbons that light up the night sky, enthralling even "sourdoughs" (old-timers) in Alaska.

The aurora was named after the Roman goddess of dawn, and was long thought to be produced by sunlight reflected from polar snow and ice, or refracted light much like rainbows.

The University of Alaska is but one of many facilities where research still continues into the phenomenon, but so far, research seems to indicate that the aurora is caused by radiation emitted as light from atoms in the upper atmosphere as they are hit by fast-moving electrons and

Intense, but brief (one-day) auroral displays will occur during that period, while long lasting (7-10 days) auroral displays will occur during the years 2003-2006.

For more pictures, go to The Aurora Page, or to Northern Lights Photos, for lots of links to great photos. For a step by step lesson on Auroras, try this site.

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We wanted to show you this aurora borealis, by Eric Engman of the Fairbanks Daily News Miner, that illuminated the sky above the Cripple Creek area off of the Parks Highway outside of Fairbanks early Thursday morning, March 21, 2002. Shown in a 30 second exposure. The Big Dipper can be seen at the top of the picture, if you **click on it to see it full size**.

Directions for taking pictures of the aurora: Use a wide-angle lens and a sturdy, well balanced tripod. Slower films, ASA 100 to 200, capture bright colors but will require longer exposures; the lights will appear smeared. ASA 1000 speed film records clearer shapes, but the colors may not be as vivid and the photos are often grainy.

Shoot at F-2.8 and hold the shutter open for 20 to protons. The kind of atom determines the color.

It also appears that the sun has an influence: auroras become brighter, more distinctive, and are spread over a larger area two days after intense solar activity. Two days is the time it takes the "solar wind" to arrive.

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Best Time to Watch

The "Northern Lights", at their most dazzling from December to March when nights are longest and the sky darkest, can usually be seen even as far south as Juneau.

Undulating ribbons of light may shimmer in the sky for hours, like glowing, dancing curtains of green, yellow and orange or dark red, or magnificent veils with a full spectrum of colors, and with the altitude of its lower edge 60 to 70 miles above the earth.

Or the aurora may last 10-15 minutes, twisting and turning in patterns called "rayed bands", then whirling into a giant green corona in which rays appear to flare in all directions from a central point, and finally fade away.

The rarest aurora is the red aurora, like the one of February 11, 1958, which is still talked about today.

An Eskimo tale records that the northern lights are spirits playing ball in the sky with a walrus skull. Another legend, calls them the flaming torches carried by departed souls guiding travelers to the afterlife.

The scientific explanation is that the aurora is a physics phenomenon taking place 50 to 200 miles above the Earth.

30 seconds. The time of the exposure depends on the brightness of the aurora.

If you want very in-depth instructions, try this link.

If you are visiting Fairbanks in the winter, you may want to observe the aurora borealis from the warmth of the aurorium at the Chena Hot Springs Resort.

Tall windows allow maximum viewing

If you are visiting Fairbanks in the summer, you can still get a look at the Aurora Borealis.

Solar winds flow across the Earth's upper atmosphere, hitting molecules of gas lighting them up much like a neon sign.

To study the phenomenon, researchers at the University of Alaska Fairbanks shoot rockets loaded with special instruments into the aurora from a launch pad at the Poker Flat Research Range, 30 miles northeast of town.

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Auroral Displays

The aurora occurs along ring shaped regions around the north and south geomagnetic poles. The intensity of the displays vary from night to night and throughout each night.

An intense auroral display can cause many problems on the ground, such as intense electric currents along electric power lines (causing blackouts) and oil pipelines (enhancing corrosion). The aurora can disturb the ionosphere and disrupt short wave communication. Auroral discharge electrons have even damaged the electronics and solar panels of communications and meteorological satellites, rendering them inoperable.

Because of this, a major cooperative research program, the National Space Weather Program, studies these effects in an attempt to improve the prediction of intense auroral disturbances.

Best Aurora Viewing

The aurora is most active late at night or early in the morning, when the sky is clear and the air chilly. The best time to watch is in spring and fall, especially February,

Photographer LeRoy Zimmerman has set the aurora to music with his "The Crown of Light" photo symphony. The show features panoramic slide photography of the aurora borealis projected on a 30-foot screen, with classical music to set the mood.

Shows are at 6:45 p.m. and 7:45 p.m. daily at Ester Gold Camp (in Ester, six miles west of Fairbanks), with additional shows at 6 p.m. Wednesday through Saturday in July. Prices are $6 for adults and $3 for children 3-12. For information, call (907) 479-2500.

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Two videos are also available through the University of Alaska Fairbanks. "The Aurora Explained," a 26-minute video with footage and nontechnical explanations of the lights, and "The Aurora Color Television Project," a mix of video and music only, are both available for $20 ($4 postage and handling) at either the Geophysical Institute (907) 474-7487 or University Press (888) 252-6657.

"The Aurora Watcher's Handbook," by Neil Davis, professor emeritus of geophysics at the University of Alaska Fairbanks, is also available through University Press. The paperback recounts both legends and science surrounding the aurora.

March, September, and October. One of the best times to look for the Northern Lights will be when it is dark because of a new moon.

Hardy Alaskans like to put on their parkas and lie on their backs in the snow to watch. The best viewing happens outside of Fairbanks, away from the city lights.

Winter tourists might want to try the top of Ester Dome which gives a view of the sky from horizon to horizon. A nice valley view can be seen in the Chatanika area.

Closer to town, try the Gilmore Trail looking west, or go to south Peger Road to escape the streetlights. If you are staying in a hotel, you can head down the street to wherever it seems a little darker. Winter visitors have been known to stand or lie in the middle of the Ranch Motel's roomy second parking lot to watch the lights.

There are also excellent web sites with pictures and information on the aurora.
Here is one!

http://pamelajoy.com/aurora.html

Joul Mission

Miguel Larsen of Clemson University will arrive in Fairbanks in February to oversee his Joule mission, named for a unit of energy.

As its name indicates, the Joule mission will measure the

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The Poker Flat Research Range tour also includes some excellent slides of the Aurora, and of course the Geophysical Institute tour also has lots of Aurora information, since that is one of the main things they are studying.

This season (2003) is the 32nd year of launches from Poker Flat. The year-round staff of 20 awaits the first launch window. Three experiments involving seven rockets are plammed. Launch windows are set for Jan. 22 to Feb. 8 and Feb. 18 to March 8. The launches will take place when the weather is clear and the aurora strong, sometime between midnight and 6 a.m.

HIBAR Mission

The HIBAR (High Bandwidth Auroral Rocket) mission is scheduled for the first window. At about 1,000 meters per second, a Black Brant IX rocket will fire into the night sky, entering the electron stream that is the northern lights. The 40 feet long rocket will relay information to the ground, where principle investigator Jim LaBelle of Dartmouth will be waiting.

heat produced by the buzzing electrons that make up the northern lights. Larsen believes his experiment will show that the electrons actually heat up the atmosphere, a potential problem if they create a drag on satellite momentum.

Joule will launch four rockets in about 20 minutes. The first rocket, a Terrier Orion, will release a spread of trimethyl aluminum, a harmless chemical tracer, into the aurora. Two minutes later an instrumentation rocket will lift off, measuring heat levels in the aurora. Another tracer and instrumentation pair will take off eight minutes later.

Tracers react with oxygen, producing carbon dioxide, water vapor and aluminum in the electron stream. The result will be a spectacular 30-minute auroral display visible from Arctic Village to Anchorage. Cameras at Arctic Village, Toolik Lake and in the Yukon Territory will record wind patterns highlighted by the tracers.

Three Rocket UAF Mission

The third mission, using three rockets, will be supervised by UAF Assistant Professor Mark Conde. It has been years "since UAF has been a principle investigator on a project," according to range manager Greg Walker.

With his Horizontal, E-region Experiment, or HEX, Conde, from NASA's Wallops Flight Facility in Virginia, is leading UAF in its first Poker Flat attempt since 1995.

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