THE SEATTLE TIMES AND KING 5

Brain STORM™

Join the BrainSTORM Weather Program

every Monday and Thursday through December 14, 2006, for a fun, close-up look at the weather with KING 5's chief meteorologist, Jeff Renner.

Autumn is Aurora Season!

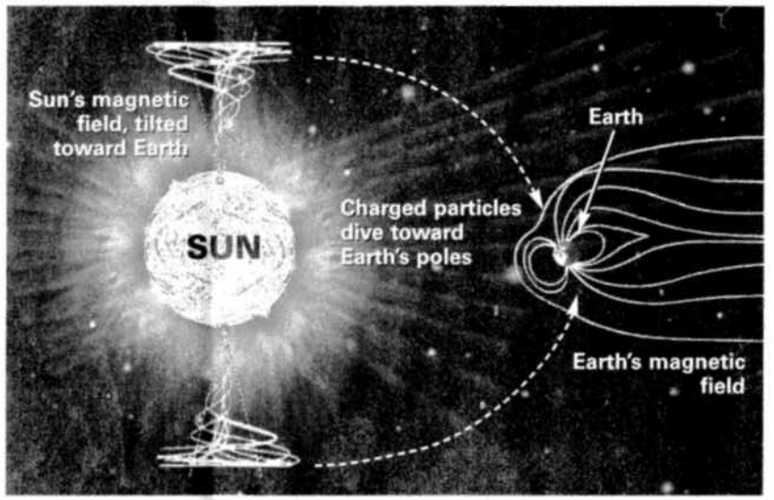
We expect the yearly change of color in trees every autumn. The fiery reds, oranges and yellows provide a nice contrast to the increasingly gray and rainy skies. But there's another burst of color that often occurs each autumn that we don't expect — the display of color high up in the atmosphere when a stream of charged particles collides with the magnetosphere. The **magnetosphere** is essentially a bubble of electrons and protons that protects us from the sun's solar wind. A big blast of **solar wind** is called a CME — short for coronal mass ejection. You can understand why we just call such events CME's.

When such a "storm" of particles from the sun collides with our planet's magnetosphere, that collision knocks loose some of the electrons and protons ordinarily trapped there. They rain down lower into the earth's atmosphere (though they never reach the ground), glowing wherever they hit other atoms, typically oxygen or nitrogen. This display is called aurora borealis in the northern hemisphere, and aurora australis in the southern hemisphere — though most people refer to it simply as either northern lights or southern lights. Scientists know the seasons on this planet have no effect on the sun's activity. But they also know that records consistently show a big jump in the number of such displays during the months of September, October and November. The question then, is why?

Scientists admit they don't know the whole answer, but they do believe they understand some of it. That part of the story begins with the earth's magnetic field. Remember that our planet's magnetic field includes both the north and south magnetic poles and allows us to find our way with compasses. Compass needles point to the nearest pole and actually dip or tilt downward the closer the compass gets to that pole. The needle is actually pointing to the magnetic field. The earth, of course, isn't the only place in the solar system that has a magnetic field. The sun has one too — a much bigger one — and it's shaped like a spiral funnel because the sun also rotates. When that funnel is tilted toward the earth's poles, it's easier for particles in the solar wind to flow deep into the earth's magnetic field. That makes an aurora more likely to happen, and that tilt is most favorable twice during the year — in April and in October. The part that scientists don't understand is why more auroras occur in the fall than in the spring.

When night skies are clear, it's worth looking for that ghostly glow — usually green or red — that marks the northern lights. Of course, there are many other sights worth examining in late autumn skies and we'll examine those in our next BrainSTORM column. Incidentally, you can find excellent information on solar storms and the likelihood of northern lights at the Web site **www.spaceweather.com**.

Interaction between the sun and earth's magnetic fields that create the aurora effects



Weather activity

Have you ever seen an aurora borealis or australis? What did it look like? Try to find some people who have seen one before or find images in the library or on the Internet. Make a list of all of the words you can think of that might describe this phenomenon; share these adjectives together in class.

In the online archives of The Seattle Times, look for stories about other natural phenomena and take turns in class teaching one another about what you have learned.