

Planetary Wonderings

January Focus: Explorer 1 and Cosmic Rays

By Mary-Frances Bartels, NASA Solar System Ambassador

Welcome to 2008! Our planet has made it another circuit around old Sol. I apologise for the tardiness of this column. I came down with a case of the “dread mopus” (sorry for using an obscure term probably only known to those who followed a particular newspaper columnist from Denver, CO --- it was the best description I could find) a few days after Christmas and was flat on my back for a while. It is good to be up and back on the computer once again. Now, on to some fun . . .

Did anyone watch the Tournament of Roses Parade on the first? Each year NASA’s Jet Propulsion Laboratory builds a float. This year’s theme was “50 Years of Space Exploration.” The float featured an “Explorer 1” that “launched” from the center. In its wake arose a collection of historic JPL robotic explorer depictions, as well as planetary ports of call.

For those of us that were not around 50 years ago, on January 31, 1958 Explorer 1 became America's first satellite to reach Earth orbit, initiating our nation into the space age. The primary science instrument on Explorer 1 was a cosmic ray detector designed to measure radiation in Earth orbit. Once in space this experiment, designed by Dr. J. Van Allen, discovered a much lower cosmic ray count than expected. The theory of the Van Allen belts was surmised, and later proved, by another US satellite launched two months later. Explorer 1 was the first satellite to gather information about the space environment.

Cosmic rays have continued to be an object of study. Just a few months ago the Chandra X-Ray telescope helped determine that most cosmic rays emanate from supernova remnants. Another source is postulated to be the center of our own galaxy. These “rays” are not really rays at all, but rather extremely energetic particles that continually bombard the Earth, and even pass easily through the human body. A year before Explorer 1 launched, Bell Labs made a film, *The Strange Case of the Cosmic Rays* (check out <http://tinyurl.com/yuec6u> for more info). For its time the film was an excellent resource on the subject, and has somewhat stood the test of time. I would recommend it for all ages, including adults.

Resource of the Month: www.spaceweather.com Space weather, you ask? Yes, Space Weather. This is one of my all time favorite sites. It gives information about the solar wind conditions as well as more “mundane” happenings like meteor showers and comet sightings. Being that we are starting a new solar cycle, I plan to feature space weather in a future column. Meanwhile, enjoy looking over this site and getting a head start. Feel free to sign up for their e-mail alert service.

Activity of the Month: Make a cloud chamber and see cosmic ray traces for yourself. Ever since I saw *Strange Case of the Cosmic Rays* I thought it would be neat to make a cloud chamber and see the rays, or their “footprints,” for myself. I found some simple plans at <http://crop.unl.edu/claes/HUSEP/CloudChamberPlans.doc> and was glad to see that they were from an event in Colorado our family always enjoyed attending, called “The Little Shop of Physics.” Each year in February Colorado State University in Fort Collins would open up their physics department with live demonstrations and hand-on experiments for the public to see and participate in the “phun of physics.” Another source of cloud chamber plans, complete with a more thorough discussion of cosmic rays and discussion questions may be found at <http://www.lepp.cornell.edu/Education/rsrc/LEPP/Education/TeacherResources/cloudchamber.pdf>.

Suggestions, questions, and comments about “Planetary Wonderings” are welcomed and may be directed to stargazer @ keeplookingup.net (remove spaces). Past columns may be found at www.keeplookingup.net (click on “Planetary Wonderings” on the right side of opening screen).

Remember to *keep looking up!*

Sources (not mentioned in article): <http://www.jpl.nasa.gov/explorer/history/>
<http://www.space.com/scienceastronomy/080102-tw-cerenkov-radiation.html>