

Astronomy for Teachers

John Parejko

November 14, 2007

Start date: 19 November 2007, Mondays, 8 weeks

Time: 5:00-7:00 pm

(two sessions will last until 9:00 pm)

Location: 919 Disque, Drexel University

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Abstract

The purpose of this workshop series is to provide elementary, middle and high school teachers with a stronger background in astronomy and an overview of the methods of modern astronomy. All Philadelphia area public school teachers are invited to attend, and 6th grade teachers are particularly welcome. This series will provide 20 hours of credit applicable to the Act 48 of 1999 teacher enrichment requirements. This will not be a math intensive series, but it will use a little geometry and algebra. There is no cost for the workshop. The enrollment limit is 25 teachers.

Class will normally be 2 hours long, with a short break. Two of the classes will be 4 hours in length, with the second half devoted to time in the observatory. This observatory time will be used to connect the material with what we can see in the sky, as well as perform one of the 6th grade student labs. A primary focus of this series is "how we know what we know." To this end, I will provide a list of free and/or inexpensive online and print resources from NASA, AAAS, STSCI and various universities for further reading. We will develop and perform in-class projects, with the goal of providing the teachers with directly-usable projects for their students.

Short reading assignments will be selected from web pages or handouts. There will be a short quiz at the beginning of each class to help me gauge what you already know, as well as check what you remember from the previous class. My goal is to ensure that you will be able to answer basic questions that your students may come up with, and also to provide "talking points" to get your students' interest. These themes are listed below, but I will be happy to cover other areas if they are of particular interest to the participants.

Primary themes and questions:

- The reason for the seasons. (including the phases of the Moon and the motions of the planets)
- Who are astronomers? (including guest talks, and astronomers from around the world and across time)
- What is astronomy? (including the nature of science, astronomical nomenclature and experiment vs. observation)
- You can't get there from here. (including every place we've yet visited, reaching just to the edge of the solar system)
- Tantalus's problem: you can look, but you can't touch. (including the electromagnetic spectrum, different kinds of telescopes and what we can actually measure)
- We are starstuff. (including stellar evolution, $E = mc^2$, supernovae, pulsars and black holes)
- A changing universe. (including galaxies, galactic evolution, clusters and quasars)
- You can't see it all. (including dust, cold gas, ultra-hot gas, giant black holes and dark matter)
- How old is the universe? (including cosmology, dark energy and the beginning and end of time)