

**May 2003**  
**PHYS 108 Astronomy Abroad: American Southwest**  
**Dr. Tyler Nordgren**  
**Duke 108, x2935**  
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The purpose of this brief course description is to address common concerns. Once enrollment is confirmed, we will meet to cover all issues below plus others not listed in greater detail.

Proposed course listing and title: PHYS 108 Astronomy Abroad : American Southwest

Offered by: Dr. Tyler Nordgren, Professor of Physics

Office information: Duke Hall 108, x2935

Date course begins: 05-01-03 Date course ends: 05-29-03

Course fee: \$1700 Includes payment for: All vehicle costs for transportation, all lodging costs and \$15 a day in food. All National Park entrance fees.

Anticipated expenses beyond course fee borne by each student: Half of all meals;  
optional activities; personal expenses; provide own sleeping bag

Deposit required: \$400 Date due: 11-10-02

Balance of course fee due by: 02-01-03 Course enrollment limit: 8

Pre-requisites (if any): A working knowledge of algebra, geometry and trigonometry  
as well as approval of the professor. Students must be able to camp for four nights in a  
tent, and be able to walk six miles one day.

Course features/descriptions: Travel to astronomical observatories in Arizona and New  
Mexico. Behind scenes tours of telescopes at Kitt Peak, the Very Large Array, Chaco  
Canyon, and Lowell Observatory. Talks by professional astronomers.

Students will spend nights looking through telescopes, doing astrophotography, and  
spend two nights on a 72-inch research telescope imaging deep-sky objects.

## **General Goals and Information**

**Who are the people that push back the frontiers of human knowledge?** Are all astronomers men with white hair and lab coats? We will meet them and hear presentations from them.

**What is the latest astronomical research being done by these people?** And what is science anyway? How does it work?

**Where is this research taking place?** We will travel to three modern observatories (Kitt Peak, the Very Large Array, and Lowell Observatory) and one ancient observatory: Chaco Canyon. We will tour, and **use**, telescopes at these modern "temples" of science.

**When?** The entire month of May 2003.

**Why?** Because we live in a technological world and only through an understanding of what science is, how it works, and why it is different from other human endeavors can we make informed decisions about its veracity. It will also be a truly "behind the scenes" look at an active field of science often portrayed in gross error by the media.

**How will we do this?** I am an active member of the astronomical community and together we will go and meet the people who seek to understand why the Universe "is."

For the month of May you will learn about, and view through amateur telescopes, many objects in the night sky. The culmination of the class will be when you write a proposal telling me what you want to observe, and why, using one of Lowell Observatory's large research telescopes at their dark-sky site. Below is a list of the activities you will be taking part in along the way.

## **Medical/Health Concerns**

If you've ever taken a family road-trip then you should be physically able to take this course. We will be traveling by van between towns and cities in Arizona and New Mexico. In these places we will be staying in motels and hostels. However, there are a couple exceptions to the "family road-trip" model. The first is that frequently we will spend several hours outside in the dark observing through the telescope or experimenting with astrophotography. While temperatures will not be too low at night in May, it is impossible to predict precisely. Seriously consider how much you will enjoy spending up to four or five hours in the cold darkness away from all lights and amenities. Secondly, we will spend three to four nights camping in campgrounds at Chaco Culture National Park and elsewhere. These places have bathroom facilities. However, you will be sleeping in tents. During the day at Chaco, there is a planned 6-mile round trip hike over fairly level ground. You must be in good enough physical condition that you can complete this hike in temperatures that could be as high as 80 degrees. During the month,

there will also be other opportunities to hike or explore several National Parks in New Mexico and Arizona. Be sure to bring along any medicines you need on a regular, or daily, basis. **No illegal drug use will be tolerated.**

### **Living Conditions**

During our time in Tucson and Flagstaff, AZ we will be staying in hostels. You will almost certainly be sharing a room with others. In Socorro, New Mexico we will be staying in a motel, again, everyone will have at least one roommate. As stated before, there will also be four nights spent in tents during the middle of the month. Consider how comfortable you will be in these conditions. \$15 a day will be provided for each of you for food. Anything beyond this you will have to provide for yourself.

### **Weather/Terrain**

Temperatures during the day in Northern Arizona and New Mexico can reach into the 80s, but will probably be cooler. During the night temperatures will drop considerably and probably reach into the 40s. There is probably little chance of rain or snow although neither is unheard of. While the 6-mile hike will be over fairly level ground, there will be opportunities for more rugged hiking if you wish, particularly at the Grand Canyon.

### **Financial Concerns**

The fee of \$1700 covers virtually all costs. You are required to cover the cost of your own food over and above \$15 a day. There are two books you will need to purchase which should run you no more than \$100 in total. You will be required to provide your own sleeping bag. If you cannot provide one for yourself, you will be required to rent one at your own expense. The above activity fee covers all entrance fees, transportation costs, and lodging fees. In order to make reservations for various activities and programs a deposit of \$400 will be due by 11-10-02. The balance will be due by 02-01-03.

### **What to Bring/What not to bring**

Each student is allowed one suitcase. We will be renting a 15 person van for a total of 9 people. The additional room must hold all luggage and the Physics department telescope. There will be opportunities to do laundry during the month. You must bring clothing that will keep you warm at night in temperatures down to the 30s. You must bring footwear that will keep your feet warm, dry, and allow you to walk for six miles. You must bring a hat to keep the sun out of your eyes, and your head warm at night. You must bring a sleeping bag. You should bring a water canteen, camelback, or bottle, which you can easily carry for the times we will spend outside. I highly encourage you to bring a camera and tripod. As the time for class approaches we will discuss other incidental needs in more detail.