Astrophysics at South Carolina State University


Summary

South Carolina State University (SCSU) is a Historically Black College/University (HBCU) with an enrollment of approximately 4,200 students, most of whom are undergraduates. A number of faculty members are currently involved in space science related activities in the areas of faculty research, student research and K-14 outreach. This includes seven (7) Ph.D.s in physics or astronomy actively engaged in the activities described herein. Additionally, several chemistry and biology faculty members are interested in expanding their research into the field of astrobiology. We are interested in partnering with one or more OSS missions in the areas of faculty research, undergraduate student research and outreach.

For more information:
http://physics.scsu.edu

Recent Faculty Activities

Astrophysics
- Ionization structure of the starburst galaxy NGC 1569
- Correlation of radio and IR properties of objects in the Spitzer First Look Survey
- IR spectroscopy of comets
- Making Large Scale Structure results from the SDSS accessible to the non-expert (see Daniel Smith's poster)
- Modeling the accretion stream in polars (magnetic CVs)
- 3-D stellar modeling using massively parallel processing
- Extensive outreach to K-14 community through standards-correlated, inquiry-based workshops and other activities

Material Science
- Studying contributions from elastic scattering events, pion-production events, and cosmic-ray traversals using data obtained by the CRRES satellite.
- Research on the fundamental mechanisms of radiation effects on oxides of FGMOS transistors
- Developing a simulation code to predict the Single Event Upset in optical detectors (i.e. GaAs)
- Studying Thermoelectric Ceramic Oxide Materials (Na xCo2O4) as a new class of electrically conducting yet thermally insulating ceramics
- Determination of the properties of Doped Bi-Based High Tc Superconductors

Recent Outreach Events

- SCSU held a teacher videoconference workshop with the OSS MESSENGER E/PO Team on April 24, 2004
- SCSU has partnered with two of the NASA Explorer Schools in South Carolina and will conduct teacher workshops and school observing nights
- A total of 39 individuals completed an intensive 1-week summer, graduate education course for in-service teachers entitled "Space Science for Teachers" during the summers 2001-04
- Workshops for teachers covered a range of topics and experiences including astro-biology, the five space science themes of NASA and a hands-on experience controlling a radio telescope remotely over the Internet
- An on-campus planetarium is used for K-14 and the general public

Pre-REU Program in Astrophysics

- Eight week, residential, summer internship in astrophysics at SCSU for underrepresented minority students
- Over 40 students participated during the summers of 1998-2004
- Students attended from 12 minority institutions in 9 states
- SCSU interns subsequently participated in REU-type internships at:
  - University of Chicago
  - Goddard Space Flight Center
  - Lawrence Livermore National Lab
  - Kitt Peak National Observatory
  - Planetary Science Institute
  - University of South Carolina

Student Research Topics

- Analysis of HST NICMOS images
- Analysis of 2-D, longslit spectra of SNR
- 3-D plotting & analysis of early release data from Sloan Digital Sky Survey
- Use of wavelets in image compression
- Modeling of the gas stream in polars
- Mapping the galaxy at the 21-cm line
- Morphology of extended objects in CCD image

FACULTY

OUTREACH

STUDENTS