Tracy R. Tuttle

Bethel College
Assistant Professor of Physics and Astronomy
Director of Mabee Observatory

Education

M.S. Degree : Physics - July 1997, The Wichita State University, Wichita, KS.
B.A. Degree: Physics - May 1984, Fort Hays State University, Hays, KS.

Areas of Specialization

1) Experimental Physics - techniques and procedures in experimental physics including development of advanced laboratory topics such as Superconducting Quantum Interference flux quantization and gamma ray spectroscopy.

2) Medium Resolution Stellar Spectroscopy – use of several spectrographic devices to study gross and time-dependent behavior of stellar envelopes.

3) Astrometric and Photometric measurements of asteroids and photometry of variable stars – especially cataclysmic variables.

Courses Taught

PHY121 – Introduction to Astronomy
PHY141/142 – Introductory Physics (algebra based)
PHY221/222 – General Physics (calculus based)
PHY301 - Advanced Physics Lab
PHY321 – Analytical Mechanics
PHY331 - Modern Physics
PHY333 – Thermodynamcis
PHY341 – Electricity and Magnetism
PHY 481/482 - Natural Sciences Seminar

Publications

The Universe at a Glance - '91. Lake Afton Public Observatory. A series of exotic and off-beat topics in astronomy aimed at the novice astronomer, student and interested educator. Used by many as a supplemental addition to course material.

Astronomy Activities - '91. Lake Afton Public Observatory. Co-Author of two workbooks to offer grade school, high school and beginning college students some hands on, innovative activities in astronomy. This in conjunction with the above mentioned "*The Universe at a Glance"* won an award for academic excellence from the Kansas Museums Association.

Physics 11 Lab Manual - '91. The Wichita State University. Developed the currently used laboratory manual and exercises to better address current interests, topics and needs in the beginning undergraduate physics courses.

Magnetic Flux Quantization in the Yttrium Barium Copper Oxide Superconducting Quantum Interference Device '97. The Wichita State University. Master's degree thesis.

Presentations

Direct Vision Prism Spectroscopy - June 2005. Guest presenter at University of Kansas Astronomy Symposium. Presented report on development and results of direct vision prism spectrometer with an approximate dispersion of 1 to 2 angstroms/pixel.

Amateur Spectroscopy - November 2006. – Guest speaker at Central Plains Astronomical Association. Spoke regarding initial results from study of emission stars and their dynamic atmospheres.

Your Night Sky - March 2003. Guest speaker of "Life Enrichment" Series at Bethel College. Presented current status, projects and opportunities (student and public) at Mabee Observatory.

An Introduction to Mabee Observatory and Amateur Astronomy - February 2003. Guest speaker at Newton Rotary Club. Introduced the college's observatory, equipment and possibilities.

Public Observation Shows - Academic Year 2003 -2004. Various public observation shows (15 total) running the range of nearly all types of visible astronomical objects.

Observing the Summer Sky - 2001. Participated as guest speaker at inaugural meeting of the North Central Kansas Astronomical Society -

The Quantum Properties of the SQUID (Superconducting Quantum Interference Device - 2000. Bethel College Natural Sciences Seminar. Presented the fascinating macroscopically manifested quantum properties of the YBCO SQUID. Including the Meissner Effect and Magnetic Flux Quantization as a special session of the Natural Sciences Seminar.

Flux Quantization and Maxwell's Equations -'98. The Wichita State University. Physics department seminar. Presented the concept of magnetic flux quantization with regards to our current understanding and the connection between our faith in Maxwell's quintessential descriptions of electromagnetic phenomena.

The Universe at a Glance - '95. Bethel College Life Enrichment Program. Presented timely topics in Astronomy and Cosmology with emphasis on the awesome and awe inspiring nature of our grand Universe.

Dynamics of the Pole Vault - '89. Emporia State University Track & Field Coaches Clinic. Demonstrated the physical dynamics and proper technique regarding this unique event in Track &Field.

Student Projects and Seminars:

Michael Waltner – Sp '07. High Dispersion Spectroscopy. Development and testing of a high dispersion spectrograph capable of a dispersion of close to 1 angstrom per pixel.

Johann Reimer – Sp '06. Variable Star Photometry. Photometry measurements and analysis of two types of variable stars: an RR Lyrae star – WZ Cygni and an Eclipsing Binary – VZ Herculis.

Kate Becker – Sp '04. Elusive Red Gems of the Sky: A Study of Carbon Star Spectroscopy. Acquisition and analysis of the spectra of cool, evolved stars known as "carbon stars".

Travis Stephenson – Summer/Fa '03. Mars 2003 perihelic opposition. A study of measurable parameters during Mars' close approach to Earth.

Luke Schmidt - Sp '03. Minor Planet Astrometry. Utilizing the college's 16" telescope, Luke found, tracked and subsequently plotted the orbital elements of several asteroids

Brent Martens - Sp '01. Digital Video Analysis of the 2000 Summer Olympics ... The Physics of Athletic Performance.

Brad Thimm - Sp '01. Brownian Motion and Analysis Using Data Gathered via Digital Video Analysis.

Lee Smith - Sp '00. Investigations of Earth's Local Magnetic Field using a Hall Effect Probe and Modulation Spectroscopy.

Todd Zerger - Sp '99. Construction and Testing of a Flux Locked Magnetometer Using a YBCO superconducting SQUID.

Preston Barger - Sp '98. Computerized Position Acquisition and Coordinate Transformations for Dobsonian Mounted Portable Telescopes.

Eric Peters - Sp'98. Superconducting Properties of the YBCO SQUID and Applications.