

CURRICULUM VITAE FOR ANTHONY W. CRIDER

EDUCATION

Rice University (Houston, TX)

1999 - Ph. D. in Space Physics and Astronomy

Analysis and Interpretation of Gamma-Ray Burst Continuum Spectral Evolution with BATSE Data (Thesis Advisor: Edison P. Liang)

1998 – M. S. in Space Physics and Astronomy

Bowling Green State University (Bowling Green, OH)

1989 – Bachelor of Science (Physics major, Mathematics minor)

EMPLOYMENT HISTORY

Elon University (2002-2006)

Associate Professor of Physics, Assistant Professor of Physics

Developed and tested novel classroom pedagogies in astronomy and physics courses. Continued research in gamma-ray astronomy and guided students in construction of robotic observatory. Chaired university committee to develop a plan addressing faculty workload.

American University (2000-2002)

Assistant Professor

Instructed conceptual and algebra-based physics courses, incorporating on-line homework, full multimedia lectures, Just-in-Time Teaching, and workshop physics pedagogies. Advised undergraduate and graduate students in independent research projects. Cultivated collaborative relationship with the National Capital Astronomers.

Director of Studio Learning Program, College of Arts and Sciences

Renovated physics laboratories into learning studios. Installed and trained faculty in use of classroom computer network and advanced presentation technology.

Interim Coordinator of Multimedia Design & Development Program

Coordinated efforts of three departments involved in the university's interdisciplinary multimedia degree program. Collected data and calculated projections for future enrollments in program classes. Composed draft schedule based on course pre-requisites to better advise students in scheduling.

Naval Research Laboratory (1999-2000)

National Research Council Associate

Investigated background and sensitivity limitations in the design of a gamma-ray calorimeter to be flown on NASA's Gamma-ray Large Area Space Telescope (GLAST). Discovered that the planned data-suppression scheme would unacceptably degrade energy resolution below NASA specifications.

Rice University (1996-1999)

NASA Graduate Fellow

Analyzed gamma-ray burst (GRB) spectra and uncovered inconsistencies between popular burster theories and the time-resolved spectra. Also made predictions with saturated inverse Comptonization GRB model which were later supported by BeppoSAX X-ray satellite observations.

Astronomy Class Instructor

Developed curriculum for and acted as primary instructor in astronomy class targeted at middle school science and math teachers.

Los Alamos National Laboratory (1992-1996)

Research Assistant

Processed archival data from Pioneer Venus Orbiter to create a gamma-ray burst catalog. Performed simulations of radiation transfer through atmosphere to optimize selection of bands for a remote-sensing satellite. Applied maximum-entropy methods to deconvolution of simulated images from the ALEXIS soft X-ray satellite. Upgraded existing neutron-scattering analysis code to use new version of commercial maximum entropy package.

Michigan State University (1991)

Student Intern

Tested techniques in fiberoptic welding and their effect on the light transmission of plastic scintillating fibers intended for use in Superconducting Super-Collider instrumentation.

Bowling Green State University (1989-1993)

Planetarium & Observatory Student Director

Trained astronomy lab instructors in the use of university's 1/2-m telescope. Maintained collection of several 6-inch telescopes for undergraduate use. Assisted in planetarium show production and presentation. Also led observing sessions for undergraduate astronomy students and the general public.

UNIX/VAX Computer Consultant

Consulted computer users in accessing the university's mainframe and X-terminals.

PEER-REVIEWED PUBLICATIONS

Hot Seat Questioning: A Technique to Promote and Evaluate Student Dialogue

Crider, A., *Astronomy Education Review*, Issue 2, Volume 3: 137-147 (2004).

Results from the Beam Test of the Engineering Model of GLAST Large Area Telescope

do Couto e Silva, E. et al., *Nuclear Instruments and Methods in Physics Research*, Section A, Volume 474, Issue 1, p. 19-37 (2001)

An Analytic Function Fit to Monte Carlo X-Ray and g-Ray Spectra from Thomson Thick Thermal/Nonthermal Hybrid Plasmas

Böttcher, M., Saxena, R., Crider, A., Liang, E. P., Smith, I. A., & Kusunose, M, *The Astrophysical Journal Supplement Series*, 135, 1 (2001)

Testing the Gamma-Ray Burst Blastwave Model: A Primer

Crider, A. & Liang, E. P., *The Astrophysical Journal Supp. Series*, 127 (2000)

Testing for Synchrotron Self-Absorption in GRB 970111

Crider, A. & Liang, E. P., *Astronomy & Astrophysics Supp. Series*, 138, 405 (1999)

GRB990123: The Case for Saturated Comptonization

Liang, E. P., Crider, A., Böttcher, M., and Smith, I. A., *The Astrophysical Journal*, 519, L21 (1999)

The Hardness Evolution of Gamma-Ray Burst Pulses

Crider, A. et al., *Astronomy & Astrophysics Supp. Series*, 138, 401 (1999)

Multiwavelength Observations of GX 339-4 in 1996. I. Daily Light Curves and X-ray and Gamma-Ray Spectroscopy

Smith, I. A., Liang, E. P., Lin, D., Moss, M., Crider, A., Fender, R. P., Durouchoux, Ph., Corbel, S., and Sood, R., *The Astrophysical Journal*, 519, 762 (1999)

Spectral Hardness Decay with Respect to Fluence in BATSE Gamma-Ray Bursts

Crider, A., et al., *The Astrophysical Journal*, 519, 206 (1999)

Time-dependent Photoelectric Absorption, Photoionization and Fluorescence Line Emission in Gamma-Ray Burst Environments

Böttcher, M., Dermer, C., Crider, A., & Liang, E. P., *Astronomy & Astrophysics*, 343, 111 (1999)

Evolution of the Low-Energy Photon Spectra in Gamma-Ray Bursts

Crider, A., et al., *The Astrophysical Journal*, 479, L39 (1997)

Physical Model of Gamma-Ray Burst Spectral Evolution

Liang, E. P., Kusunose, M., Smith, I. A., & Crider A., *The Astrophysical Journal*, 479, L35 (1997)

PROFESSIONAL PRESENTATIONS AND CONFERENCE PROCEEDINGS

“Living and Learning in Second Life” A Firsthand Exploration & Tour of a User-Created Virtual World

Border, P., Crider, A., Linden, P. & Joseph, B., *Games, Learning, and Society Conference*, Madison, WI (2006)

A Magnetar in the BATSE Catalog?

Crider, A., *American Institute of Physics Conference Proceedings* 838, 64 (2006)

Astronomy in the "Hot Seat"

Crider, A., *North Carolina Section of the American Association of Physics Teachers Meeting*, Davidson, NC (2004)

The Pedagogy of Blackboard On-Line Assessments

Crider, A., *Instructional Design and Development Technology Showcase*, Elon, NC (2003).

Elon University Robotic Observatory

Phillips, M. & Crider, A., *North Carolina Section of the American Association of Physics Teachers Meeting*, Wrightsville Beach, NC (2003)

It's the End of the World as We Know It

Crider, A., *Triad StarFest*, Greensboro, NC (2003).

Model Fitting for a Non-Majors Astronomy Class Using Starry Night and Excel

Crider, A., *Cosmos in the Classroom 2004 Handouts and Papers Volume* by the Astronomical Society of the Pacific, (2004).

Astronomy in the "Hot Seat"

Crider, A., *Cosmos in the Classroom 2004 Handouts and Papers Volume* by the Astronomical Society of the Pacific, (2004).

The Evolution of Synchrotron Self-Absorption Parameters in Prompt GRB Spectra

Crider, A., *2003 Gamma-Ray Burst Conference*, Santa Fe, NM (2003).

Science Education in a Studio Environment

Crider, A., *Anne Ferren Teaching Conference*, Washington, DC (2002).

Is There a Correlation Between FCI and MCAT Normalized Gains?

Crider, A., *124th American Association of Physics Teachers National Meeting*, Philadelphia, PA (2002)

An Analytic Function Fit to Monte-Carlo X- and Gamma-ray Spectra from Thomson Thick Thermal/Nonthermal Hybrid Plasmas

Böttcher, M.; Saxena, R.; Crider, A. W.; Liang, E. P.; Smith, I. A., *Exploring the gamma-ray universe. Proceedings of the Fourth INTEGRAL Workshop*, 271 - 274 (2001)

Evaluating Spectral Functions Used to Test the Synchrotron Shock Model

Crider, A., *American Institute of Physics Conference Proceedings* 526, 475 (2000)

Time Profiles and Spectral Evolution of GRB Pulses

Liang, E. P., Crider, A., Böttcher, M., and Smith, I., *American Institute of Physics Conference Proceedings* 526, 446 (2000)

PROFESSIONAL PRESENTATIONS AND CONFERENCE PROCEEDINGS [CONT.]

The Spectral Evolution of Gamma-Ray Bursts

Crider, A.; Liang, E. P.; Preece, R. D.; Briggs, M. S.; Pendleton, G. N.; Paciesas, W. S.; Band, D. L.; Matteson, J. L., *Bulletin of the American Astronomical Society*, Vol. 30, p.1380

Evaluation of Proposed Gamma-Ray Burst Spectral Evolution Trends

Crider, A., Liang, E., Preece, R., Briggs, M., Pendleton, G., & Band, D., *Bulletin of the American Physical Society*, Vol. 43, No. 2, 1086 (1998)

Evidence for Saturated Inverse Compton Scattering in Gamma-Ray Bursts

Crider, A., Liang, E., & Smith, I., *Revista Mexicana de Astronomia y Astrofisica*, 7, 218 (1998)

Confronting Synchrotron Shock and Inverse Comptonization Models with GRB Spectral Evolution

Crider, A., Liang, E. P., & Preece, R. D., *American Institute of Physics Conference Proceedings* 428, 359 (1998)

Testing the Invariance of Cooling Rate in Gamma-Ray Burst Pulses

Crider, A., Liang, E. P., & Preece, R. D., *American Institute of Physics Conference Proceedings* 428, 63 (1998)

Saturated Compton Scattering Models for the Soft Gamma-Ray Repeater Bursts

Smith, I. A., Liang, E. P., Crider, A., Lin, D., & Kusunose, M., *American Institute of Physics Conference Proceedings* 410, v.2, 1512 (1998)

A Thermal-Nonthermal Inverse Compton Model for Cyg X-1

Crider, A., Liang, E. P., Smith, I. A., Lin, D., & Kusunose, M., *American Institute of Physics Conference Proceedings* 410, v.2, 868 (1997)

Hardness Ratio versus Duration for PVO compared to BATSE and PHEBUS

Smith, I. A., Crider, A., Liang, E. P., Dunne, B. C., Fenimore, E. E. & Li, H., *American Institute of Physics Conference Proceedings* 384, Part 1, 101 (1996)

A Search for March 5th-like Bursts in the PVO Database

Crider, A. & Fenimore, E. E., *American Institute of Physics Conference Proceedings* 384, Part 2, 926 (1996)

Ptolemy with (P)True Basic

Smith, D., & Crider, A. W., *Great Lakes Planetarium Association Conference Proceedings* (1991)

FACULTY AWARDS AND TEACHING GRANTS

Testing a "Quest-Points-Level" Game Structure in the Astronomy Classroom
Center for the Advancement of Teaching and Learning Scholar (2006-2008)

Determining the Rate of Magnetar Flares in Nearby Galaxies, \$6573
Faculty Research and Development Grant (2005)

Best Pedagogical Paper for "Astronomy in the Hot Seat", \$150
North Carolina Section of the American Association of Physics Teachers (2004)

Simulating Maya Astronomy with Desktop Planetarium Software, \$2575
Technology Course Enhancement Grant, Elon University (2004)

Desktop Planetarium Software for the Astronomy Classroom, \$702
Technology Course Enhancement Grant, Elon University (2003)

Science Education in a Studio Environment: Phase I, \$4,896
University Curriculum Development Support Award, American University (2001)

Filming and Editing "Street Physics" Films, \$810
General Education Faculty Assistant Program Award (2001)

Gauging Student Utilization of Digitally Delivered Lectures, \$1,568
College of Arts & Sciences Mellon Award (2000)

PROFESSIONAL ORGANIZATION MEMBERSHIPS

American Astronomical Society
American Association of Physics Teachers
Astronomical Society of the Pacific
Committee on Space Research
North Carolina Section of the American Association of Physics Teachers
Sigma Pi Sigma Physics Honors Society

SERVICE TO UNIVERSITY COMMITTEES

Goldwater Scholarship Search Committee (2002-2003)
Subcommittee on Workload and Teaching Load (2002-2005, chair for 2003-2005)
Department of Physics Faculty Search Committee (2002-2003, 2005-2006)
Academic Council (2005-2008)
Family Work Policy Committee (2005-2006)

COURSES TAUGHT

Elon University (2002-2007)

GST 201 IS	Astronomy in Mexico: Maya to Modern
PHY 102	Introduction to Astronomy
PHY 102L	Astronomy Lab
PHY 111	General Physics
PHY 112	General Physics I
PHY 113	General Physics with Calculus
PHY 251	Numerical and Mathematical Methods in Physics
PHY 371	Introduction to Astrophysics

American University (2000-2002)

PHYS 100	Physics for the Modern World
PHYS 105	College Physics
PHYS 205	College Physics
PHYS 570	Quantum Mechanics
MMDD 200	Multimedia I

Rice University (1999)

SPAC 205	Introduction to the Solar System
----------	----------------------------------

STUDENT AWARDS AND FELLOWSHIPS

National Research Council Associateship (1999)

William F. Marlar Scholar Award (1997 & 1999)

NASA Graduate Student Research Program Fellowship (1996-1998)

Rice University Graduate Fellowship (1994)

Bowman Undergraduate Scholar Award (1993)

Bowling Green State University Distinguished Service Award (1993)

Sigma Pi Sigma Physics Honor Society (1989)

Kappa Mu Epsilon Mathematics Honor Society (1988)

Allen County Cattlemens' Association Scholarship (1990 & 1992)

Bowling Green State University Presidential Scholarship (1989-1991)