

# Scott T. Miller

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## Appointments

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**Lecturer**, 2002-present – the Pennsylvania State University, University Park, Pennsylvania

**Instructor**, 2000-2002 – University of California at Santa Barbara, Santa Barbara, California

## Education

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**Doctor of Philosophy, Astronomy**, 2002, University of Maryland, College Park, Maryland

*Dissertation:* The Nature and Origin of Diffuse Ionized Gas in the Halos of Nearby Edge-On Galaxies

*Advisor:* Dr. Sylvain Veilleux

**Master of Science, Astronomy**, 1995, University of Maryland, College Park, Maryland

**Bachelor of Science, Civil Engineering** 1991 (with highest honors), Rutgers University, New Brunswick, New Jersey

**Bachelor of Arts, Mathematics**, 1991 (with honors), Rutgers University, New Brunswick, New Jersey

## Research and Teaching Interests

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Physics/Astronomy Education Research and Instruction; Active/Collaborative Learning; Teaching with Technology

## Refereed Publications

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**Miller, S. T.**, Veilleux, S., *Extraplanar Emission-Line Gas in Edge-On Spiral Galaxies. I. Deep Emission-Line Imaging*, 2003, ApJS, 148, 383

**Miller, S. T.**, Veilleux, S., *Extraplanar Emission-Line Gas in Edge-On Spiral Galaxies. II. Optical Spectroscopy*, 2003, ApJ, 592, 79

Veilleux, S., Shopbell, P., **Miller, S.**, *Biconical Outflow in the Seyfert Galaxy NGC 2992*, 2001, AJ, 121, 198

Schlegel, E. M., Petre, R., Colbert, E. J. M., and **Miller, S.**, *A Deep ROSAT HRI Observation of NGC 1313*, 2000, AJ, 120, 2373.

Veilleux, S., Bland-Hawthorn, J., Cecil, G., Tully, R. B., and **Miller, S. T.**, *Galactic-Scale Outflow and Supersonic Ram-Pressure Stripping in the Virgo Cluster Galaxy NGC 4388*, 1999, ApJ, 520, 111.

Suntzeff, N. B., Phillips, M. M., Covarrubias, R., Navarrete, M., Perez, J. J., Guerra, A., Acevedo, M. T., Doyle, L. R., Harrison, T., Kane, S., Long, K. S., Maza, J., **Miller, S.**, Piatti, A. E., Claria, J. J., Ahumada, A. V., Pritzl, B., and Winkler, P. F., *Optical Light Curve of the Type Ia Supernova 1998bu in M96 and the Supernova Calibration of the Hubble Constant*, 1999, AJ, 117, 1175.

**Miller S.**, Schlegel, E. M., Petre, R., and Colbert, E., *X-ray Properties of NGC 1313: Second Epoch PSPC Observations*, 1998, AJ, 116, 1657.

## Non-Refereed Research Publications

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Veilleux, S., **Miller, S.**, *Extraplanar Emission-Line Gas in Edge-On Spiral Galaxies*, 2003, AAO Newsletter, 102, 8.

**Miller, S. T.**, Veilleux, S., *Diffuse Ionized Gas in Edge-On Spiral Galaxies*, 1999, BAAS, 195, 31.04

Schlegel, E. M., Petre, R., Colbert, E. J. M., and **Miller, S.**, *A Deep ROSAT HRI Observation of NGC 1313*, 1999, BAAS, 195, 70.05

**Miller, S.**, Veilleux, S., *A Deep Multi-Line Imaging Survey of Edge-On Spiral Galaxies*, 1999, AAO Newsletter, 88, 4.

## Curriculum-Related Publications

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Deming, G., Hufnagel, B., **Miller, S.**, Miller, K., Comins, N., Raddick, J., *AstroPortal*, 2008, W. H. Freeman

**Miller, S.T.**, *Introductory Astronomy*, Pennsylvania State University, University Park, PA, 2007 (Note: this online course was developed and published for the entire Penn State System, comprising 26 campuses and 130,000 students across the state.)

McKenzie, D., Adler, C., Ziegler, D., **Miller, S.**, *Companion Website for Astronomy Today*, 2008, Prentice Hall

Wood, D., Terndrup, D., **Miller, S.**, *Instructor's Manual and Test Bank: 21<sup>st</sup> Century Astronomy*, 2007, W. W. Norton and Company

**Miller, S.T.** (editor), *Penn State Astronomy 11 Laboratory*, 2003 – present, Hayden-McNeil Publishing, Inc.

Duncan, T., Holcombe, C., Fauerbach, M., Ziegler, D., Hildreth, S., Harpell, E., Adler, C., **Miller, S.**, *Companion Website for Astronomy: A Beginner's Guide to the Universe*, 2005, Prentice Hall

**Miller, S.T.**, *Active/Cooperative Learning Activities for Introductory Astronomy*, Pennsylvania State University, University Park, PA, 2004 (<http://www.astro.psu.edu/~stm/ACL/ACLactivities.html>) Note: this website was created for the use of Penn State Astronomy faculty teaching introductory astronomy courses.)

Deming, G., **Miller, S.**, and Trasco, J., *Cooperative Learning Activities in Introductory Astronomy for Non-Science Majors*, 1997, University of Maryland, College Park

Deming, G. L., **Miller, S. T.**, Trasco, J. D., *A Sourcebook of Cooperative Learning Activities for Introductory Undergraduate Astronomy for Non-Science Majors*, 1996, BAAS, 188, 15.01

Miller, K. A., **Miller, S. T.**, *Supplementary Information for Introductory Astronomy*, University of Maryland, College Park, MD, 1996 (<http://www.astro.umd.edu/education/supplement.html>)

## Other Works in Progress

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Miller, S. T., Redman, S., *Using Video to Simulate Personal Interaction in an Online Environment*, in preparation

Miller, S. T., Richards, M., Grabowski, B., *Incorporating Active/Collaborative Learning Exercises in an Online Environment*, in preparation

Miller, S. T., Richards, M., Grabowski, B., *Assessing the Effectiveness of Multimedia in an Online Introductory Astronomy Course Compared to Traditional Lecture*, in preparation

## Research Presentations

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195<sup>th</sup> American Astronomical Society meeting, Atlanta, GA, *Diffuse Ionized Gas in Edge-On Spiral Galaxies*, Jan. 2000, Oral presentation

188<sup>th</sup> American Astronomical Society meeting, Madison, WI, *A Sourcebook of Cooperative Learning Activities for Introductory Undergraduate Astronomy for Non-Science Majors*, June 1996, Poster presentation

## Invited Presentations

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*Using Technology to Improve Teaching in Introductory Astronomy*, Teaching and Learning with Technology Symposium, Pennsylvania State University, University Park, PA, March 2008

*Faculty Use of Radio Clickers in the Classroom*, Panel discussion, Teaching and Learning with Technology Symposium, Pennsylvania State University, University Park, PA, March 2008

*The Search for Other Earths*, 8<sup>th</sup> Annual Astrofest, Pennsylvania State University, University Park, PA, July 2007

*The Winter Night Sky*, Cub Scout presentation, State College, PA, Dec. 2006

*From Earth Looking Outwards, Hubble Observes God's Creations*, Church Youth Organization presentation, State College, PA, June 2006

*What If the Moon Did Not Exist?*, 6<sup>th</sup> Annual Astrofest, Pennsylvania State University, University Park, PA, July 2005

*Worlds beyond Pluto*, 5<sup>th</sup> Annual Astrofest, Pennsylvania State University, University Park, PA, July 2004

*Active/Collaborative Learning in Introductory Astronomy*, Astronomy Board of Visitors Meeting, Pennsylvania State University, University Park, PA, Oct. 2002

*Exploring Lunar Features and the Phases of the Moon*, 2nd Annual Science and Technology Day, University of California, Santa Barbara, May 2001

## Teaching Experience

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### **Pennsylvania State University – University Park, Pennsylvania**

**2008, Lecturer, Introduction to Astronomy, web-based course** (ASTRO 001), web-online

**2007, Lecturer, Introduction to Astronomy, web-based course** (ASTRO 001), hybrid classroom/web

**2004 – present, Lecturer, Introduction to Astronomy** (ASTRO 010, 300 students)

**2002 – present, Lecturer, Introduction to Astronomy** (ASTRO 001, 100 students)

**2002 – present, Lecturer, Elementary Astronomy Laboratory** (ASTRO 011, 24 students)

**2002 – present, Lecturer, Supervised Experience in College Teaching** (ASTRO 602, 5 – 10 students) – Teach semester long course for teaching assistants on effective teaching styles and techniques.

### **University of California, Santa Barbara – Santa Barbara, California**

**2000, Instructor. Concepts of Physics** (NatSci 1A – survey course for non-science majors)

**2001, 2002, Instructor. Introductory Physics** (Phys 6A, Pre-meds)

**2002, Instructor. Introductory Physics** (Phys 6B, Pre-meds)

**2000, 2001, Instructor. Introductory Physics** (Phys 6C, Pre-meds)

**2002, Instructor. Basic Physics** (Phys 2, Engineering & Physics Majors)

**2001, 2002, Instructor. Basic Physics** (Phys 4, Engineering & Physics Majors)

**2001, Instructor. Honors Seminar** (Phys 4H, Engineering & Physics Majors)

### ***University of Maryland – College Park, Maryland***

**1996, Teaching Assistant. Introduction to Astronomy** (ASTR 100 – survey course for non-science majors, 20 students/section, 3 sections)

**1993 – 1995, Teaching Assistant. General Astronomy** (ASTR 101 – survey course for non-science majors, 20 students/section, 2 sections+lab)

## **Faculty Professional Service**

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**2002 – present, Active/Collaborative Learning Coordinator, Pennsylvania State University.** Created active/collaborative learning (A/CL) website for large lecture classes. Facilitate the inclusion of A/CL materials in the introductory astronomy courses.

**2002 – present, TA supervisor, Pennsylvania State University.** Supervise teaching assistants (TAs) in laboratory instruction and grading. Coordinate lab sessions and proctoring duties.

**2002 – present, First-Year Testing, Counseling and Advising Program (FTCAP), Pennsylvania State University.** Advise 20 – 30 entering students each year during the summer.

### **Faculty Committees, Pennsylvania State University**

**2002 - present, Undergraduate Committee.** Assist in curriculum development as well as the evaluation, implementation and revision of the department's undergraduate courses.

**2002 - present, Telescope Committee.** Monitor the needs of various groups which require the use of departmental telescopes.

**2002 - present, Outreach Committee.** Discuss outreach possibilities and ways to increase interest in astronomy in the general public.

**2002 - present, TA-of-the-year Committee** (chair). Evaluate teaching assistants' performance and nominate TA of the year.

**2000 – 2002, Physics Department, University of California, Santa Barbara.** Supervised TAs in grading of homework and exams. Coordinated discussion and review sessions for large-lecture classes.

## **Professional Service as a Reviewer**

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**Freedman & Kaufmann, “Universe”, W. H. Freeman**

8<sup>th</sup> edition, 2008 – authored a series of interactive learning activities for 9 chapters to be available on the web.

**Chaisson & McMillan, “Astronomy Today”, Prentice Hall**

6th edition, 2008 - created two sets of 28 practice quizzes associated with textbook to be available as an online supplement for students.

5<sup>th</sup> edition, 2005 – detailed review of 28 chapters

review of supplemental CD-ROM material (19 tutorials, 34 Physlet illustrations, and 61 videos)

detailed review of 19 tutorials and associated questions, plus 4 new tutorials.

**Comins & Kaufmann, “Discovering the Universe”, W. H. Freeman**

8<sup>th</sup> edition, 2008 - detailed review of 5 chapters

**Seeds, “Horizons”, Brooks/Cole Publishing Co.**

10<sup>th</sup> edition, 2008 - comparison of chapters with competing textbook

8<sup>th</sup> edition, 2004 – pre-review of 3 chapters.

**Snow & Stern**, W.W. Norton

1<sup>st</sup> edition (not yet published, 2007) - detailed review of 6 sample chapters from proposed textbook.

**Chaisson & McMillan**, “**Astronomy: A Beginner’s Guide to the Universe**”, Prentice Hall

5<sup>th</sup> edition, 2007 – detailed review of 5 chapters

4<sup>th</sup> edition, 2004 – detailed review of 15 chapters

**Hester et al.**, “**21st Century Astronomy**”, W.W. Norton & Co.

2<sup>nd</sup> edition, 2007 – detailed review of 7 chapters , created testbank of questions for all 21 Chapters

**Schneider & Arny**, “**Pathways to Astronomy**”, McGraw-Hill Publishing Company

1<sup>st</sup> edition (2007) – review of 5 units and overall review of textbook format.

**Seeds**, “**Foundations of Astronomy**”, Brooks/Cole Publishing Co.

9<sup>th</sup> edition, 2007 – pre-review of 3 chapters.

**Villard**, “**Visualizing Astronomy**”, John Wiley & Sons, Inc.

1<sup>st</sup> edition (unpublished, 2006) – detailed review of 3 sample chapters from proposed textbook.

**Deming**, “**Your Universe**”, Brooks/Cole Publishing Co.

1<sup>st</sup> edition (unpublished, 2003) – extensive review of 4 chapters, plus overall review of entire book.

**Bennett et al.**, “**The Essential Cosmic Perspective**”, Addison-Wesley Longman, Inc

2<sup>nd</sup> edition, 2003 – overall review of book, focusing on one chapter.

#### **Online Focus Groups:**

**Review of “The Visualizing Series” of textbooks**, John Wiley & Sons, Feb. 2006

**Learning Style Assessment Virtual Focus (My Power Learning)**, Content Connections, April 2006

## **Research Experience**

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**Research Assistant**, University of Maryland, 1996 – 2000, Advisor: Dr. Sylvain Veilleux

Observed ~ 25 galaxies in H $\alpha$  and [N II] $\lambda$ 6583 and compiled statistically meaningful sample of Diffuse Ionized Gas morphologies. Acquired long-slit spectroscopy and performed emission-line diagnostics of extraplanar gas. Modeled observed spectroscopic emission lines in order to constrain characteristics of the gas and photoionization sources. Over 36 nights observing experience on telescopes ranging from sub-meter up to 4-m class.

**Education Research Assistant**, University of Maryland, 1995, Advisor: Prof. Grace Deming

Developed new group activities for a variety of class settings which encourage cooperative learning among undergraduate students and improve class participation and attention. Co-authored NSF funded sourcebook which incorporates these activities and is now used in over 200 institutions.

**Research Assistant**, Laboratory for High-Energy Astrophysics, Goddard Space Flight Center, 1994, Advisors: Dr. Robert Petre and Dr. Eric Schlegel

Analyzed 2 epochs of ROSAT PSPC data of NGC 1313 and new sources discovered therein. Investigated variability and possible nature of sources. Developed a more accurate PSPC point spread function and subtracted from sources, which led to the discovery of yet another source.

## Awards and Honors

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First Year Student Faculty Recognition Luncheon, Pennsylvania State University, 2007  
Award to Promote Teaching Excellence, Department of Astronomy, University of Maryland, 1995.  
Edward Fuller Brooks Memorial Award, Rutgers University, 1991  
Henry M. Johnson '76 Memorial Scholarship, Rutgers University, 1988 - 1991  
Dean's List, Rutgers University, 1987 - 1991  
Donald J. Butler Award, Rutgers University, 1990  
Edward G. Nawy Award, Rutgers University, 1990  
Edward O. Davis Memorial Student Summer Employment Scholarship, Rutgers University, 1990  
Edward J. Bloustein D.S.P., Rutgers University, 1990  
Garretson Hageman 1968 Memorial Award, Rutgers University, 1989  
Class of 1925 Scholarship, Rutgers University, 1986 - 1988  
General Honors Program, Rutgers University, 1986 - 1988  
Distinguished Scholars Program, Rutgers University, 1986 - 1988

## Other Professional Service

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**2004 – present, Facilitator, Pre-K Outreach Event.** Pre-K outreach activities for 15-25 children and their chaperones.

**2004, 2005, 2007, Volunteer, Astrofest,** Pennsylvania State University, University Park, PA, July 2005. Annual departmental outreach program for general public astronomy awareness.

## Professional Development

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### Certifications

*Schreyer Institute for Teaching Excellence certification*, Pennsylvania State University, May 2003

*University Teaching and Learning Program certification*, The Center for Teaching Excellence and The Graduate School of the University of Maryland, April 2000

### Workshops/Classes Attended

*Blended Learning Initiative Faculty Academy (BLI 2000)*, Pennsylvania State University, University Park, PA, Summer 2006. Course focused on the teaching and learning skills necessary to be a successful online instructor.

*Blended Learning Initiative Faculty Academy (BLI 1000)*, Pennsylvania State University, University Park, PA, Spring 2006. Course focused on the design and development of an online course.

*Advanced Strategies for Creating a Learner-Centered Introductory College Astronomy Course: A Tier II Workshop*, Center for Astronomy Education Teaching Excellence Workshop, Kona, HI, July 2006

*ANGEL day III: A Symposium of Faculty Excellence*, Pennsylvania State University, University Park, PA, May 2005

*Cosmos in the Classroom 2004: A Hands-on Symposium on Teaching Introductory Astronomy*, Astronomical

Society of the Pacific, Boston, MA, July 2004

*Improving the Introductory Astronomy Survey Course for Non-Science Majors Through Active Learning*, Center for Astronomy Education Teaching Excellence Workshop, Atlanta, GA, Jan. 2004

## **Professional Memberships**

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Astronomical Society of the Pacific (ASP), 2004 – present

American Astronomical Society (AAS), 1996 – present

American Society of Civil Engineers, 1988 - 1993

Tau Beta Pi engineering honor society, 1990 – 1991

Chi Epsilon Civil Engineering society, 1989 – 1991

Phi Beta Kappa honor society, 1990 – 1991

## **Registrations**

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Engineering-in-Training - 1992