

Luke David Keller

Curriculum Vitae

Ithaca College
Department of Physics
Center for Natural Sciences 264
Ithaca, NY 14850

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Education

1999 Ph.D. in Astronomy, University of Texas at Austin
1995 M.A. in Astronomy, University of Texas at Austin
1990 B.Sc. in Physics, University of Arizona, Tucson

Teaching Experience and Positions Held

2009-present **Associate Professor, Ithaca College, Department of Physics**

Teaching: *Introduction to Physics I (algebra based)*
Physics of Sound (Introductory, algebra based)
Astronomy (Introductory, algebra based)
Principles of Physics II: Electricity & Magnetism (calculus based)
Principles of Physics III: Heat & Optics (calculus based)
Principles of Physics IV: Modern Physics (calculus based)
Mathematical Methods for Physics
Quantum Mechanics (1st semester, using Griffiths)
Selected Topics in Advanced Physics: Optics
Selected Topics in Advanced Physics: Astrophysics
Advanced Laboratory II
Senior Thesis

Research: Observational Astronomy. Studies of chemistry, formation, and evolution of stars and planetary systems using infrared imaging and spectroscopy.

Optics. Instrumentation for astronomical imaging and spectroscopy. Current project: Stratospheric Observatory for Infrared Astronomy (SOFIA).

Physics Pedagogy. Development of performance-based teaching methods for introductory courses in physics and astronomy.

2003-2009 **Assistant Professor, Ithaca College, Department of Physics**

Summer 2003 **Lecturer, Cornell University.** Astronomy 107 (Introductory Astronomy), Department of Astronomy.

1999-2003 **Research Associate, Cornell University.** Project Scientist for the Faint Object Infrared Camera for the Sofia Telescope (FORCAST). Design and construction of a facility class 5-40 μm camera for SOFIA. Optical design and integration of instrument, planning and facilitating observations with FORCAST, as well as pre-flight, ground-based calibration, verification, and testing.

1997-1999 **Adjunct Faculty, Austin Community College, Austin Texas.** Instructor of record for introductory astronomy courses.

1993-1999 **Graduate Research Assistant, University of Texas.** Optical design of Infrared Fabry-Perot Spectrometer, fabricated and tested large silicon immersion echelle gratings (dissertation project), designed a near-IR immersion echelle spectrograph, transformed a mid-IR echelle spectrograph into a near-IR spectrograph.

Visiting Appointments and Consulting

- 2006-present **Consultant, Institute for Global Environmental Strategies.** Review of educational materials from NASA Education and Public Outreach programs.
- 2009-2010 **Astronomy Special Consultant, American Heritage Dictionary.** Composition and review of astronomy and astrophysics word definitions.
- Summer 2009 **Visiting Scholar, Cornell University.** SOFIA test and verification, data processing and analysis software and documentation.
- Summer 2008 **Visiting Scholar, Cornell University.** Software development, design consulting, and facility test planning for SOFIA project.

Honors and Awards

- 2010 **Faculty Excellence Award**, Ithaca College
- 2006 **Outstanding Instructor Recognition**, *College Board Advanced Placement Best Practices Physics Course Study*
- 2006 **Inducted into Sigma Xi**, the scientific research society
- 1997 **Outstanding Teaching Assistant**, American Association of Physics Teachers
- 1996 **Fred T. Goetting Presidential Scholarship**, University of Texas at Austin

Professional Affiliations

Sigma Pi Sigma, Society of Physics Students, Sigma Xi, American Astronomical Society, Astronomical Society of the Pacific, Society of Photo-optical Instrumentation Engineers

Active Grants

- 2008-2011 NASA Jet Propulsion Laboratory, "*PAH emission from disks around intermediate-mass stars: the peculiar aroma of hydrocarbons orbiting Herbig Ae/Be stars*," \$25,000
- 2011-2013 Universities Space Research Association, "FORCAST Grism Spectroscopy," \$430,000

National and Community Service

- 2011-2014 **SOFIA Users Group**
- 2011-2014 **Lime Hollow Center for Environment and Culture:** Board of Directors
- 2011 **Lincoln Center Institute for the Arts in Education:** Imagination Award advisory panel
- 2010 **Lincoln Center Institute for the Arts in Education:** Imagination Award advisory panel
- 2009-2010 **NASA Infrared Telescope Facility:** Time Allocation Committee
- 2008 **Spitzer Space Telescope:** Cycle 5 review panel
- 2008 Local Organizing Committee, **Division for Planetary Sciences** of the **American Astronomical Society**, annual meeting, Ithaca, NY: helped organize two-day workshop on teaching introductory college-level astronomy
- 2007 **NASA:** Astronomy and Physics Research and Analysis ground-based instrumentation review panel

Ithaca College Service

- 2011-2014 **Committee for College-wide Requirements**
- 2010 **President's Advisory Council on Innovation**
- 2008-2013 **Academic Policies Committee** (elected representative from Natural Sciences)
- 2010 **Faculty Workload Task Force**
- 2008-present Faculty Mentor, **Outdoor Adventure Learning Community**
- 2008 Physics Department hiring committee
- 2006-2007 Policy sub-committee of the **Academic Policies Committee** (Chair)
- 2006-2007 **Faculty Council** ad hoc committee: Standardization of Student Statements (a.k.a. Teaching evaluations) (Chair)

2006-2008 **Faculty Council** representative to the Academic Policies Committee
2006 School of Humanities & Sciences ad hoc committee: review of General Education requirement in the natural sciences
2005–2010 **Faculty Council** (elected representative from Natural Sciences)

Publications in refereed journals (* indicates Ithaca College student co-author)

R. D. Gehrz, E. E. Becklin, J. de Buizer, T. Herter, **L. D. Keller**, A. Krabbe, P. M. Marcum, T. L. Roellig, G. H. L. Sandell, P. Temi, W. D. Vacca, E. T. Young, and H. Zinnecker, **2011**, "Status of the Stratospheric Observatory for Infrared Astronomy (SOFIA)," *Advances in Space Research*, submitted

Luke Keller and Jürgen Wolf, "NASA's New Airborne Observatory: Flown on a Boeing 747, SOFIA will carry infrared astronomy to new heights," *Sky & Telescope Magazine*, October **2010** issue, p. 22

Najita, Joan R., Carr, John S., Strom, Stephen E., Watson, Dan M., Pascucci, Haria, Hollenback, David, Gorti, Uma, **Keller, Luke D.** **2010**, "Spitzer Spectroscopy of the Transition Object TW Hya," *Astrophysical Journal*, 712, 274

Keller, L. D. & Sloan, G. C. **2009**, "PAH emission from disks around intermediate-mass stars: the peculiar aroma of hydrocarbons orbiting Herbig Ae/Be stars." *Astronomical Society of the Pacific Conference Series: Cosmic Dust - Near and Far*, 414, 107

Christopher C. Stark, Marc J. Kuchner, Wesley A. Traub, John D. Monnier, Eugene, Serabyn, Mark Colavita, Chris Koresko, Bertrand Mennesson, **Luke D. Keller** **2009**, "51 Ophiuchus: A Possible Beta Pictoris Analog Measured with the Keck Interferometer Nuller," *Astrophysical Journal*, 703, 1188

Watson, Dan M., Leisenring, Jarron M., Furlan, Elise, Bohac, C. J., Sargent, B., Forrest, W. J., Calvet, Nuria, Hartmann, Lee, Nordhaus, Jason T., Green, Joel D., Kim, K. H., Sloan, G. C., Chen, C. H., **Keller, L. D.**, d'Alessio, Paola, Najita, J., Uchida, Keven I. Houck, J. R. **2009** "Crystalline Silicates and Dust Processing in the Protoplanetary Disks of the Taurus Young Cluster," *Astrophysical Journal Supplement*, 180, 84

Luke D. Keller, G. C. Sloan, W. J. Forrest, S. Ayala, P. D'Alessio, S. Shah*, N. Calvet, L. Hartmann, J. Najita, B. Sargent, A. Li, D. M. Watson, & C. H. Chen **2008**, "PAH Emission from Herbig Ae/Be Stars," *Astrophysical Journal*, 684, 411

Berthoud, M.C., **Keller, L.D.**, Herter, T.L., Whelan*, D., and Richter, M.J., **2007**, "CO overtone emission from a circumstellar disk around 51 Ophiuchi," *Astrophysical Journal*, 660, 461

Chen, C. H., Sargent, B. A., Bohac, C., Kim, K. H., Leibensperger*, E., Jura, M., Najita, J., Forrest, W. J., Watson, D. M., Sloan, G. C., **Keller, L. D.** **2006**, "Spitzer IRS Spectroscopy of IRAS-discovered Debris Disks," *Astrophysical Journal Supplement*, 166, 351

Furlan, E., Hartmann, L., Calvet, N., D'Alessio, P., Franco-Hernández, R., Forrest, W. J., Watson, D. M., Uchida, K. I., Sargent, B., Green, J. D., **Keller, L. D.**; Herter, T. L. **2006**, "A Survey and Analysis of Spitzer Infrared Spectrograph Spectra of T Tauri Stars in Taurus," *Astrophysical Journal Supplement*, 165, 56

Sloan, G. C., **L. D. Keller**, W. J. Forrest, E. Leibensperger*, B. Sargent, A. Li, J. Najita, D. M. Watson, C. H. Chen, J. D. Green, F. Kemper, T. L. Herter, P. D'Alessio, P. W. Morris, D. J. Barry, P. Hall, B. R. Brandl, P. C. Myers, & J. R. Houck **2005**, "Mid Infrared Spectra of PAH Emission in Herbig Ae/Be stars," *Astrophysical Journal*, 632, 956

Calvet, N.; D'Alessio, P.; Watson, D. M.; Franco-Hernández, R.; Furlan, E.; Green, J.; Sutter, P. M.; Forrest, W. J.; Hartmann, L.; Uchida, K. I.; **Keller, L. D.**; Sargent, B.; Najita, J.; Herter, T. L.; Barry, D. J.; Hall, P. **2005**, "Disks in Transition in the Taurus Population: Spitzer IRS Spectra of GM Aurigae and DM Tauri," *Astrophysical Journal Letters*, 630, L185

- Furlan, E., N. Calvet, P. D'Alessio, L. Hartmann, W. J. Forrest, D. M. Watson, K. L. Luhman, K. I. Uchida, J. D. Green, B. Sargent, J. Najita, G. C. Sloan, **L. D. Keller**, and T. L. Herter **2005**, "Spitzer IRS Spectra Of Young Stars Near The Hydrogen-Burning Mass Limit," *Astrophysical Journal*, 621, L129
- Watson, Dan M., F. Kemper, Nuria Calvet, **Luke D. Keller**, Elise Furlan, Lee Hartmann, W. J. Forrest, C. H. Chen, Keven I. Uchida, Joel D. Green, B. Sargent, G. C. Sloan, Terry L. Herter, Bernhard R. Brandl, J. R. Houck, J. Najita, Paola D'Alessio, P. C. Myers, D. J. Barry, P. Hall, & P. W. Morris **2004**, "Mid Infrared Spectra of Class I Protostars in Taurus," *Astrophysical Journal Supplement Series*, 154, 391
- Forrest, W. J., B. Sargent, E. Furlan, P. D'Alessio, N. Calvet, L. Hartmann, K. I. Uchida, J. D. Green, D. M. Watson, C. H. Chen, F. Kemper, **L. D. Keller**, G. C. Sloan, T. L. Herter, B. R. Brandl, J. R. Houck, D. J. Barry, P. Hall, P. W. Morris, J. Najita, & P. C. Myers **2004**, "Mid Infrared Spectra of Classical T Tauri Stars," *Astrophysical Journal Supplement Series*, 154, 443
- Jura, M., C. H. Chen, E. Furlan, J. Green, B. Sargent, W. J. Forrest, D. M. Watson, D. J. Barry, P. Hall, T. L. Herter, J. R. Houck, G. C. Sloan, K. Uchida, P. D'Alessio, B. R. Brandl, **L. D. Keller**, F. Kemper, P. Morris, J. Najita, N. Calvet, L. Hartmann, & P. C. Myers **2004**, "Mid Infrared Spectra of Dust Debris Around Main Sequence Stars," *Astrophysical Journal Supplement Series*, 154, 453
- Uchida, K. I., N. Calvet, L. Hartmann, F. Kemper, W. J. Forrest, D. M. Watson, P. D'Alessio, C. H. Chen, E. Furlan, B. Sargent, B. R. Brandl, T. L. Herter, P. Morris, P. C. Myers, J. Najita, G. C. Sloan, D. J. Barry, J. Green, **L. D. Keller**, & P. Hall **2004**, "The State Of Protoplanetary Material 10 Million Years After Stellar Formation: Circumstellar Disks In The TW Hydrae Association," *Astrophysical Journal Supplement Series*, 154, 439
- Pak, Soojong, Jaffe, D. T., Stacey, G. J., Bradford, C. M., Klumpe, Eric W., & **Keller, Luke D. 2004**, "Near-Infrared Molecular Hydrogen Emission from the Central Regions of Galaxies: Regulated Physical Conditions in the Interstellar Medium," *Astrophysical Journal*, 609, 692
- E. Furlan, W. J. Forrest, D. M. Watson, K. I. Uchida, B. R. Brandl, **L. D. Keller**, & T. L. Herter, **2003**, "Near-Infrared, Adaptive Optics Observations of the T Tauri Multiple-Star System," *Astrophysical Journal Letters*, 596, L87
- Keller, Luke D.**, Pilachowski, C., & Sneden, C. **2001**, " $^{12}\text{C}/^{13}\text{C}$ in Field Halo Giant Stars", *Astronomical Journal*, Vol. 122, 2554
- Giovanelli, R. *et al.* **2001**, "The Optical/Infrared Quality of High Atacama Sites. I. Preliminary Results of Optical Seeing", *Publications of the Astronomical Society of the Pacific*, 113, 789-802
- Giovanelli, R. *et al.* **2001**, "The Optical/Infrared Quality of High Atacama Sites. II. Infrared Characteristics," *Publications of the Astronomical Society of the Pacific*, 113, 803-813
- Keller, Luke D.**, Jaffe, D.T., Ershov, O. A., Benedict, Tom A., & Graf, U. U. **2000**, "Fabrication and Testing of Chemically Micromachined Silicon Echelle Gratings", *Applied Optics*, 39, 1094
- Keller, Luke D.** 2000, "Science, Observation, and Mystery," *Parabola Magazine*, 25:2
- Levenson, N. A., Graham, James R., **Keller, Luke D.**, & Richter, Matthew J. **1998**, "Panoramic Views of the Cygnus Loop", *Astrophysical Journal Supplement*, 118, 541
- Luhman, M. L., Jaffe, D. T., **Keller, L. D.**, & Pak, S. **1995**, "H₂ Emission as a Tracer of Molecular Hydrogen: Large-Scale Observations of Orion", *Astrophysical Journal*, 436, L185
- Maiolino, R., Ruiz, M., Rieke, G. H., & **Keller, L. D.** **1995**, "New Constraints on the Unified Model of Seyfert Galaxies", *Astrophysical Journal*, 446, 561
- Pak, Soojong, Jaffe, D.T., & **Keller, L. D.** **1996**, "H₂ Emission From the Inner 400 Parsecs of the Galaxy", *Astrophysical Journal*, 457, L43

Luhman, M. L., Jaffe, D. T., **Keller, L. D.**, & Pak, S. **1995**, "A New Fabry-Perot Spectrometer for Observations of Diffuse Near-Infrared Line Emission", Publications of the Astronomical Society of the Pacific, 107, 184

Selected publications in recent conference proceedings

(NOTE: SPIE publications are full-length papers that are reviewed, but not formally refereed, by the session chairs and published in conference proceedings. SPIE proceedings are a primary journal for astronomical instrumentation.)

Ennico, Kimberly, **Keller, L.**, Adams, J., Herter, T., Deen, C., Mar, D., Chitrakar, N., Jaffe, D., Greene, T. **2007**, "Grisms For FORCAST - A New Medium Resolution 5-40 Micron Spectroscopic Mode On SOFIA - Performance Testing," American Astronomical Society Meeting Abstracts, 211, 11.14

Sweta Shah*, **Luke Keller**, and Nirbhik Chitrakar* **2006**, "Infrared Identification of Herbig AeBe stars in the Small Magellanic Cloud," American Astronomical Society/American Association of Physics Teachers Joint Meeting Joint Meeting, American Astronomical Society Meeting 209, 168.14

Keller, Luke D., Sloan, G. C., Shah, S*, Chitrakar, N.*, Forrest, W. J., Sargent, B., Watson, D. M., Li, A., Najita, J., Chen, C. H., Green, J. D., Herter, T. F., D'Alessio, P., Calvet, N., Hartman, L., Houck, J. R. **2006**, "Mid-infrared Spectra of PAH Emission in Herbig AeBe Stars," American Astronomical Society/American Association of Physics Teachers Joint Meeting, American Astronomical Society Meeting 209, 81.01

Luke Keller and Michael Rogers **2006**, "Innovative Use of SCALE-UP for Teaching General Education Astronomy," American Astronomical Society/American Association of Physics Teachers Joint Meeting Joint Meeting, American Astronomical Society Meeting 209, #71.03

Ennico, K. A., **Keller, L. D.**, Mar, D. J., Herter, T. L., Jaffe, D. T., Adams, J. D., and Greene, T. P. **2006**, "Grism performance for mid-IR (5 - 40 micron) spectroscopy," SPIE, 6269, 52

Pirger, Bruce E., Schoenwald, Justin, Herter, Terry L., Gull, George E., Adams, Joseph D., **Keller, Luke D.**, Berthoud, Marc, Henderson, Charles, Stacy, Gordon J., and Nikola, Thomas **2006**, "High-speed highly-flexible reconfigurable data acquisition system for astronomy," SPIE, 6276, 620

Adams, Joseph D., Herter, Terry L., **Keller, Luke D.**, Gull, George E., Pirger, Bruce, Schoenwald, Justin, Berthoud, Marc, Stacy, Gordon J., and Nikola, Thomas **2006**, "FORCAST: the facility mid-IR camera for SOFIA," SPIE, 6269, 34

Mar, D. J., Marsh, J. P., Jaffe, D. T., **Keller, L. D.**, and Ennico, K. A. **2006**, "Performance of large chemically etched silicon gratings for infrared spectroscopy," SPIE, 6269, 184

Keller, L. D., Ennico, K. A., Herter, T. L., Jaffe, D. T., Mar, D. J., Greene, T. **2005**, "SOFIA Observational Capabilities for Studies of Star and Planet Formation: A New Medium Resolution 5-40 μm Spectroscopic Mode on SOFIA," in *Protostars and Planets V*, Proceedings of the Conference held October 24-28, in Hilton Waikoloa Village, Hawai'i, 1286, 8481

Keller, Luke D., Herter, Terry, Stacey, Gordon, Gull, George, Schoenwald, Justin, Pirger, Bruce, Adams, Joseph, Berthoud, Marc, Nikola, Thomas **2004**, "First test results from FORCAST: the facility mid-IR camera for SOFIA," Ground-based Instrumentation for Astronomy. Edited by Alan F. M. Moorwood and Iye Masanori. Proceedings of the SPIE, 5492, 1086

Research Students

Joey Engelbrecht (Ithaca College, B.A. expected in Physics May 2013)

Working on analysis of proto-planetary disk spectra infrared image analysis software development.

Robert Lewis (Ithaca College, B.A. expected in Physics May 2013)
Working on infrared spectral and image analysis software development.

Joshua Cheng (Ithaca College, B.A. expected in Physics May 2013)
Worked on infrared image analysis software development.

Kevin Geidel (Ithaca College, B.A. in Physics May 2010)
Worked on spectroscopy and modeling of Herbig Ae/Be star-disk systems

Kevin Geidel (Ithaca College, B.A. in Physics May 2010)
Worked on spectroscopy and modeling of Herbig Ae/Be star-disk systems

Vince Whittney (Ithaca College, B.A. in Physics, May 2011)
Worked on *Spitzer* spectroscopy and modeling of Herbig Ae/Be star-disk systems

Preston Barrows^D (Ithaca College, B.A. in Physics, May 2010)
Worked on design and testing of an infrared camera for the Stratospheric Observatory for Infrared Astronomy

Jordan Hyatt (Ithaca College, B.S. in Physics May 2010)
Worked on *Spitzer* spectroscopy and modeling of Herbig Ae/Be star-disk systems

Nirbhik Chitrakar (Ithaca College, B.S. in Physics May 2008)
Currently a graduate student in astronomy at the New Mexico Institute of Mining and Technology

Brandon Sforzo (Ithaca College, B.A. in Physics, Cornell University B.S. in Mechanical Engineering, May 2008) Currently a graduate student in Aerospace Engineering at the Georgia Institute of Technology

Maksim Sipos^D (Ithaca College, B.S. in Physics May 2008)
Currently a graduate student in Physics at the University of Illinois at Urbana-Champaign

Sweta Shah^D (Ithaca College, B.A. in Physics 2007)
Currently a graduate student in Astronomy at Leiden University, The Netherlands

Michael Pacelli (Ithaca College, B.A. in Physics 2007)
Currently a graduate student in Aeronautical Engineering at SUNY Binghamton

Marc Berthoud (Cornell University, Ph.D.^{††} in Astronomy 2007)
Currently a postdoctoral research associate at the Yerkes Observatory, University of Chicago

David Whelan (Ithaca College, B.A. in Physics 2005)
Currently a graduate student in Astronomy at the University of Virginia

Eric Leibensperger^D (Ithaca College, B.A. in Physics & B.S. in Chemistry 2005)
Currently a postdoctoral researcher in Atmospheric Chemistry at MIT

^D Dana Intern with Luke Keller, Ithaca College

^{††} Luke Keller was a member of Marc Berthoud's Ph.D. dissertation committee, 2003-2007.

Summary of Invited Talks and Presentations

Public Talks

- 2011 Keynote presentation, Tompkins County Area Development, New York, "Imagination Inspires Innovation"
- 2011 Invited public talk, Sun City Radio Club, Bluffton, South Carolina, "Frequent Flyer: Radio astronomy from a flying telescope"
- 2011 Invited public talk, Southern Cayuga Planetarium, New York, "The Stratospheric Observatory for Infrared Astronomy"
- 2008 Invited public talk, Lost Dog Lounge, Ithaca, New York, Science Cabaret: "*ET Probably Does Exist*"
- 2008 Invited panelist, Lincoln Center Institute, New York: "*Imagination and Innovation*"
- 2008 Physics Café, Ithaca College: "*Searching for Extra-terrestrial Life: Molecules, UFOs, and Little Green Men*"
- 2004 Keynote presentation (with IC Prof. Beth Clark Joseph), Ithaca College Alumni Weekend: "*New Advances in Space Exploration*"
- 2004 Lecture, Longview, Ithaca, NY: "*Observing the Formation of Planets Around Distant Stars*"
- 2004 Keynote presentation, Syracuse Astronomical Society, Syracuse, NY: "*Observations of Planetary System Formation from Ground- and Space-based Observatories*"
- 2001 Invited public talk, Corning-Elmira Community College, Corning, NY: "*Current Progress in Understanding the Formation of Planetary Systems*"

Scholarly Talks

- 2011 Keynote presentation, Society of Physics Students Zone 2 Conference, Ithaca, New York, "Frequent Flyer: the Stratospheric Observatory for Infrared Astronomy"
- 2010 Chemistry Colloquium, SUNY Cortland, NY: "Astrochemistry and the formation of planetary systems"
- 2009 Science Colloquium, SUNY Oswego, NY: "*The Stratospheric Observatory for Infrared Astronomy*"
- 2009 Physics Seminar, Ithaca College, Ithaca, NY: "NASA's New Flying Observatory: A Giant Telescope in a 747"
- 2008 Invited Talk at "Cosmic Dust Near & Far" conference, Heidelberg, Germany
- 2008 Physics Colloquium, University of Missouri, Columbia, MO: "*The Stratospheric Observatory for Infrared Astronomy: Facility Overview and Plans for First Light in 2008*"
- 2008 Astrophysics Seminar, University of Missouri, Columbia, MO: "*Spitzer IRS Spectra of PAH Emission from Herbig Ae/Be Stars*"
- 2006 Science Colloquium, Wells College, Aurora, NY: "*The Formation of Planetary Systems Orbiting Other Stars*"

- 2005 Invited talk at the *2005 Winter Conference on Astrophysics*, Aspen Center for Physics, Aspen, CO: *"Mid Infrared Spectra of PAH Emission in Herbig Ae/Be stars"*
- 2002 Astronomy Colloquium, University of Florida, Gainesville, FL: *"Astrochemical Approaches to Understanding Planet Formation"*
- 2002 Astronomy Colloquium, Cornell University, Ithaca, NY: *"Chemical Mixing on the Red Giant Branch: Clues to Understanding Galactic Chemical Evolution"*
- 2001 Astronomy Colloquium, Rochester Institute of Technology, Rochester, NY: *"Current Progress in Understanding Planetary System Formation: Adding Chemistry to the Dynamical Soup"*
- 2001 Physics/Astronomy Colloquium, Middle Tennessee State University, Murfreesboro, TN: *" $^{12}\text{C}/^{13}\text{C}$ in Field Halo Red Giant Stars: Nucleosynthesis and Chemical Mixing on the Red Giant Branch"*
- 2001 Honors Seminar, Misericordia University, Dallas, PA: *"Asking Big Questions: An astronomer's perspective on the contemporary religion/science dialogue"*