



National Optical Astronomy Observatory

Kitt Peak National Observatory • Cerro Tololo Inter-American Observatory • NOAO Gemini Science Center

Robert T. Sparks

PROFESSIONAL PREPARATION

Grinnell College B.A. Physics 1990
Michigan State University M.S. Physics 1994

RECENT APPOINTMENTS

2005-Present Science Education Specialist, National Optical Astronomy Observatory, Tucson, Arizona

- Responsible for developing materials for NSF Hands-On Optics project. Tested materials and activities in classrooms and workshops. Recruited teachers to participate in the program. Organized and presented teacher workshops in California, New Mexico, Arizona, Colorado, and Maryland.
- Member of the Large Synoptic Survey Telescope (LSST) Education Team. Developing activities for LSST education and public outreach. Assisted with Project ASTRO workshops. Developed portion of online course for *Astronomy from the Ground Up*, an NSF program to train educators at small science centers.
- Designed and delivered a series of workshops for the *Promoting Inquiry in Science Education (PRISE)* project for teachers on the Navajo and Hopi Nations.
- Currently leading efforts to expand Hands-On Optics to Boys and Girls Clubs throughout the state of Arizona with a grant from the Science Foundation Arizona.
- Developed optics and light materials for *Astronomy From the Ground Up*. courses presented in person and online.

2002-Present Swift Educator Ambassador, Sonoma State University, Rohnert Park, California

Member of the Swift Education Committee (Swiss). Helped test and develop educational materials for NASA missions including Swift, GLAST, and XMM-Newton. Presented teacher workshops at local, regional, and national science teacher meetings.

2002-2005, Science Instructor, The Prairie School, Racine, Wisconsin

Taught Physics, Survey of Physics and Earth Science/Astronomy to 10th -12th grade students. Managed physics lab and oversaw transition to computer based labs. Responsible for ordering and maintaining equipment. Coached Engineering Challenge Team and Rube Goldberg Competition team. Coached Cross Country and Track.

2003 Research Experience for Teachers, National Radio Astronomy Observatory, Green Bank, West Virginia
Studied Radio Frequency Interference (RFI) on the Green Bank Telescope. Wrote data reduction routines for RFI data.

2001-2002 Fermilab Teacher Fellowship, Fermi National Accelerator Laboratory, Batavia, Illinois

Worked on the Sloan Digital Sky Survey (SDSS). Developed educational materials for SkyServer, the education and public outreach web site of the SDSS. Delivered teacher workshops at local and national meetings. Assisted with data management. Co-I for Space Telescope Science Institute IDEAS Grant, "SkyServer: Using SDSS Data in the Classroom"

1994-2001 St. Stephen's Episcopal School, Bradenton, Florida

Taught Physics, Honors Physics, AP Physics B, AP Physics C (both Mechanics and Electricity and Magnetism), Geometry and Pre-Calculus. Taught interim courses in Multi-media presentations, Astronomy, and the History of the Space Program. Organized lower school physics day. Managed Physics lab. Designed physics lab for a new school building. Coached math team. Assistant coach of Academic team. Coached Cross Country and Track.

1993-1995, Michigan State University Upward Bound, Michigan State University, East Lansing, Michigan

Designed and taught six week summer math program to low income/first generation college students. Organized field trips. Served as after school tutor during the school year.

2001 Adjunct Physics Instructor, Manatee Community College, Bradenton, Florida

Taught first year calculus based college physics.

1990-1991 Science and Math Instructor, The Good Hope School, Fredriksted, St. Croix

Taught Algebra I, Algebra II, Geometry and Physics. Taught Astronomy elective. Head Coach of JV soccer team.

SYNERGISTIC ACTIVITIES

1. Instructional Materials: Designed many of the activities on *SkyServer*, the education web site of the Sloan Digital Sky Survey. *SkyServer* activities incorporated data from the SDSS into the activities. Worked as a *Chandra Teacher Resource Agent*. Helped test and develop materials for the *NASA Educator Ambassador* program including materials for *Swift*, *GLAST*, and *XMM-Newton*.

2. Educational Partnerships: Worked with the Hands-On Universe program. Worked with MESA (Mathematics, Engineering and Science Achievement) programs in Arizona, Colorado, New Mexico and Maryland. Worked with the Orlando Science Center, Chabot Science Center, California Science Center, Maryland Science Center and the New York Hall of Science.

3. Personal Professional Development: Participated in *MSE* (Materials Science and Engineering) *Teach* at the University of Florida, Gainesville, Florida (1999) *AP Physics Teachers Workshop* at Seminole Community College, Sanford, Florida (1999), Received Father Kyle Grant for “*Observations of a Total Solar Eclipse in Germany*” *Hands-On Universe Introductory Online Course* (2000) *Project Physlab* at the Catlin-Gabel School, Portland, Oregon (2000) *Hands-On Universe Advanced Online Course* (2001) *Universe in the Classroom*, St. Paul, Minnesota (2001) *Chandra Teacher Resource Agent Summer Workshop*, Tufts University, Medford, Massachusetts, (2002, 2004). *NASA Educator Ambassador Workshop*, Sonoma State University (2002, 2004, 2006, 2008)

4. Educator Professional Development: Presented workshops at local, regional and national conferences for Hands-On Optics, NASA Educator Ambassador program, and *SkyServer*. Presented two-day workshops in several MESA states as well as science centers. Taught short courses at SPIE meetings.

5. Educational Outreach and Informal Education Efforts: Worked on *Hands-On Optics*, *Making and Impact with Light*. Organized outreach booths at local teacher fairs and *Fun Fest*. Sidewalk Astronomy with the Local Group of Deep Sky Observers in Bradenton, Florida. Telescope operator for public nights at the Modine-Bensted Observatory in Racine, Wisconsin. Volunteer astronomer with Project ASTRO.

6. Professional Organizations

American Association of Physics Teachers, American Astronomical Society, Astronomical Society of the Pacific, National Science Teachers Association, Arizona Science Teacher's Association, Arizona Association of Physics Teachers, Florida Association of Science Teachers.

Conference Talks, Posters and Workshops

Croft, S. K., R. T. Sparks, and S. M. Pompea (2007) Wilderness of Rocks Asteroid Project. Poster presented at 119th Annual meeting of the Astronomical Society of the Pacific: EPO and a changing world: Creating Linkages and Expanding Partnerships. Sept. 5-7, 2007, Chicago, IL.

Robert T. Sparks, C. Peruta, C. Ubach, C. E. Walker, S. M. Pompea “Building Student Interest Through Optics Competitions” AAS Summer Meeting May 27th – 31st, 2007

Robert T. Sparks, Stephen M. Pompea, Constance E. Walker, “Adaptive Optics Educational Outreach and the Giant Segmented Mirror Telescope” Poster presented at 119th Annual meeting of the Astronomical Society of the Pacific: EPO and a changing world: Creating Linkages and Expanding Partnerships. Sept. 5-7, 2007, Chicago, IL.

Carolyn Peruta, Erin Dokter, Constance E. Walker, Robert T. Sparks, Stephen M. Pompea “Hands-On Optics in Informal Settings: Science Camps” 119th Annual meeting of the Astronomical Society of the Pacific: EPO and a changing world: Creating Linkages and Expanding Partnerships. Sept. 5-7, 2007, Chicago, IL.

R. T. Sparks “The Challenges of Using Virtual Observatories in the Classroom” AAS Winter Meeting, Seattle January 5th – 10th, 2007

Constance E. Walker, R. T. Sparks, S. Pompea “Affordable Laser Communication for the Classroom” AAPT Seattle January 5th – 10th, 2007

Stephen M. Pompea, C. E. Walker, R. T. Sparks “Middle School Optics Education: Hitting the Target or Impedance Mismatch” AAPT Seattle January 5th – 10th, 2007

Erin F. Dokter, C. Walker, C. Peruta, C. Ubach, R. Sparks, S. Pompea “Science beyond the Classroom: Hands-On Optics and the Boys and Girls Club” AAPT/AAS Seattle January 5th – 10th, 2007

Constance E. Walker, Stephen M. Pompea, Robert T. Sparks, Chuck Bueter “Visualizing the Sky and the National Virtual Observatory: Enabling Education and Public Outreach through Large Astronomical Data Sets and Archives” 119th Annual meeting of the Astronomical Society of the Pacific: EPO and a changing world: Creating Linkages and Expanding Partnerships. Sept. 5-7, 2007, Chicago, IL.

Stephen M. Pompea, Constance E. Walker, Robert T. Sparks “Using the Hands-On Optics Terrific Telescopes Kit in the International Year of Astronomy” 119th Annual meeting of the Astronomical Society of the Pacific: EPO and a changing world: Creating Linkages and Expanding Partnerships. Sept. 5-7, 2007, Chicago, IL.

Stephen M. Pompea, Robert T. Sparks, Steven K. Croft “Asteroids and LSST EPO” AAPT Seattle January 5th – 10th, 2007

Robert T. Sparks “Optics at Large: Forming Educational Partnerships” SPIE Student Leadership Conference, San Diego August 26th – 27th, 2007

Robert T. Sparks “Terrific Telescopes: Using Hands-On Optics in Outreach” SPIE Student Leadership Conference, San Diego August 26th – 27th, 2007

Robert T. Sparks, S. M. Pompea, O. Monti, Promoting Inquiry Through Science Education: A Partnership With the Navajo Nation, American Astronomical Society, January 7th-11th, 2008

Stephen M. Pompea, R. T. Sparks, D. Isbell, Teaching Optics With Small Telescopes During the International Year of Astronomy, American Astronomical Society, June 2nd – 5th, 2008

Stephen M. Pompea, R. T. Sparks, C. E. Walker, Maintaining and Expanding the Hands-On Optics Program, American Astronomical Society, June 2nd – 5th, 2008

Robert T. Sparks, “Easy Optics Demonstrations for the Classroom”, NSTA Denver Regional Meeting, November 8th-9th, 2007

Robert T. Sparks, S. M. Pompea, C. E. Walker, “Building a Telescope From the Ground Up” Astronomical Society of the Pacific, May 31st, 2008

Robert T. Sparks, S. M. Pompea, C. E. Walker, “Using the Hands-On Optics Terrific Telescopes Kit in the International Year of Astronomy” ASP/AAS, June 2nd- 5th, 2008

Constance E. Walker, C. Bueter, S. M. Pompea, K. Berglund, T. Mann, P. Gay, B. Crelin, D. Collins, R. Sparks, “Dark Skies are a Universal Resource: IYA Programs on Dark Skies Awareness”, ASP/AAS, June 2nd- 5th, 2008

Robert T. Sparks, “Dark Skies as a Universal Resource” Astronomical League Convention, July 18th, 2008

Robert T. Sparks, “The Galileoscope and Hands-On Optics in the International Year of Astronomy”, Astronomical League Convention, July 18th, 2008

Constance E. Walker, Robert T. Sparks “Globe at Night and the International Year of Astronomy” Arizona Science Teachers Association, August 25th, 2008

Robert T. Sparks, Constance E. Walker, “The Galileoscope and the International Year of Astronomy” Arizona Science Teachers Association, August 26th, 2008

Papers/Publications

Croft, S. K., R. T. Sparks, and S. M. Pompea (2007) Wilderness of Rocks Asteroid Project. Submitted to the proceedings of: Education and Public Outreach - A Changing World: Creating Linkages and Expanding Partnerships, . Sept. 5-7, 2007, Chicago, IL, Astronomical Society of the Pacific.

Constance E. Walker, Robert T. Sparks, and Stephen M. Pompea “OPTICS EDUCATION IN THE INTERNATIONAL YEAR OF ASTRONOMY” Proceedings of Education and Training in Optics and Photonics Conference Ottawa, Ontario June 3rd – 5th, 2007

Constance E. Walker, Robert T. Sparks, and Stephen M. Pompea “HANDS-ON OPTICS SCIENCE CAMPS AND CLUBS” Proceedings of Education and Training in Optics and Photonics Conference Ottawa, Ontario June 3rd – 5th, 2007

Robert T. Sparks, Stephen M. Pompea and Constance E. Walker “THE DEVELOPMENT OF A LOW-COST LASER COMMUNICATION SYSTEM FOR THE CLASSROOM” Proceedings of Education and Training in Optics and Photonics Conference Ottawa, Ontario June 3rd – 5th, 2007

Stephen M. Pompea, Erin F. Dokter, Constance E. Walker, Robert T. Sparks “USING MISCONCEPTIONS RESEARCH IN THE DESIGN OF OPTICS INSTRUCTIONAL MATERIALS AND TEACHER

PROFESSIONAL DEVELOPMENT PROGRAMS” Proceedings of Education and Training in Optics and Photonics Conference Ottawa, Ontario June 3rd – 5th, 2007

Stephen M. Pompea, Constance E. Walker, and Robert T. Sparks “Knowledge and Wonder: Engagements With Light and Color in the Hands-On Optics Project” Chapter in “Exemplary Science in Informal Education Settings: Standards-Based Success Stories” Edited by: Robert E. Yager and John H. Falk NSTA Press 2007

M. Johnson, S. M. Pompea, E. G. Arthurs, C. E. Walker, and R. T. Sparks, "Hands-On Optics: An Informal Science Education Initiative", (2007). Book, Published Collection: SPIE Proceedings Series
Bibliography: Novel Optical Systems Design and Optimization X, 28-29 August 2007, San Diego, CA

Sparks, R.T., Pompea, S.M., Walker, C.E. 2008, ASP Conf. 389, eds. C. Garmany, M.G. Gibbs, J.W. Moody (ASP), 103, "Adaptive Optics Educational Outreach and the Giant Segmented Mirror Telescope"

Croft, S.K., Sparks, R.T., Pompea, S.M., et al. 2008, ASP Conf. 389, eds. C. Garmany, M.G. Gibbs, J.W. Moody (ASP), 249, "Wilderness of Rocks Asteroid Project"

Walker, C.E., Pompea, S.M., Sparks, R.T., et al. 2008, ASP Conf. 389, eds. C. Garmany, M.G. Gibbs, J.W. Moody (ASP), 395, "Dark Skies as a Universal Resource, Citizen-scientists, and the International Year of Astronomy"

Pompea, S.M., Walker, C.E., Sparks, R.T. , 2008, ASP Conf. 389, eds. C. Garmany, M.G. Gibbs, J.W. Moody (ASP), 415, "Using the Hands-On Optics 'Terrific Telescopes' Kit in the International Year of Astronomy"

Pompea, S. M., Walker C. E., and Sparks, R. T., 2008, "Knowledge and Wonder: Engagements with Light and Color in the Hands-On Optics Project", Exemplary Science in Informal Education Settings: Standards-Based Success Stories, R. Yager and J. Falk eds., NSTA Press, pp. 47-70.