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EDUCATION

- 1989 University of Arizona, Ph.D. Astronomy
Dissertation: "The Relationship of Galaxy Morphology to Nuclear Star Formation in Non-Interacting Spiral Galaxies"
Advisor: G. H. Rieke, Regents Professor, National Academy of Sciences
- 1977 Colorado State University, M.A.T. Physics
- 1975 Rice University, B.A. Physics, Space Physics, and Astronomy

AREAS OF SCIENCE & ENGINEERING EXPERTISE

- Design and modeling for stray light control in high-performance optical-infrared systems
- Selection of coatings and materials for extreme environments
- Design of novel surfaces for space and high temperature environments
- Optical properties of diverse materials, coatings, and surfaces for use over the entire electromagnetic spectrum
- Expert witness in optics-related patents and inventions

AREAS OF SCIENCE & ENGINEERING EDUCATION EXPERTISE

- Science and engineering education program design, development, and management
- Exhibit and instructional materials development
- Engagement strategies and programs for groups underrepresented in STEM
- Design of integrated art-science and STEAM programs

SUMMARY OF SIGNIFICANT CONTRIBUTIONS

Stephen Pompea is an internationally known expert in both optical systems and in science education. His innovative work in science, engineering, and education has resulted in over 420 conference presentations and 150 papers.

Optical Systems: He is internationally known for his inventions of spectrally selective surfaces, including ultra-black surfaces, used in many astronomical, terrestrial, and research applications. He has consulted widely in stray light control and illumination engineering and has served as an expert witness in illumination engineering patent cases. He authored the chapter on optical black surfaces for the *Handbook of Optics* and on spectrally selective surfaces for the *Encyclopedia of Modern Optics*, and serves as a fellow of SPIE and Optica.

Science Education: As a visiting professor at Leiden University, he designed and directed the International Astronomical Union Einstein Schools Programme. In a collaboration with Dr. Pedro Russo of Leiden University, they completed the first comprehensive review of the astronomy education field: "Astronomers Engaging with the Education Ecosystem: A Best-Evidence Synthesis," appeared in *Annual*

Reviews of Astronomy and Astrophysics. Pompea also served as Education and Public Outreach head at the U.S. national astronomy observatory (NOAO, now NOIRLab) and as the U.S. Project Director for the International Year of Astronomy 2009 (IYA2009). As chair of the U.S. Working Group on Telescope Kits, his leadership led to the design, creation, and distribution worldwide of over 250,000 Galileoscopes, an advanced telescope for students. He was invited to attend both White House Astronomy Nights with President Obama (2009 & 2015), setting up telescopes on the South Lawn of the White House for the President, his family, and invited students.

He also served as PI or Co-PI on 10 major competitively-funded U.S. National Science Foundation research and innovation projects for science education, totaling about 20 million USD in grant funds. Dr. Pompea received the Robert A. Millikan Medal from the American Association of Physics Teachers, the SPIE María J. Yzuel Educator Award from the International Society for Optics and Photonics, and the Esther Hoffman Beller Medal from Optica (formerly OSA–The Optical Society). He is a fellow of the American Association of Physics Teachers.

CURRENT POSITION

2018-Present **Visiting Professor**, Leiden Observatory, University of Leiden, The Netherlands.

His primary work is with the Astronomy and Society Research Group at Leiden Observatory at the University of Leiden. With collaborator Pedro Russo, two books on STEM education are being written under contract with SPIE Press. He is also working on the design of shelters using advanced optical materials for protecting lives and property in wildfires.

Previously while in Leiden, and in collaboration with NSF's NOIRLab, he designed and led the IAU100 Einstein Schools Programme, serving hundreds of schools worldwide in studying the role of gravity in astronomy. As part of this effort, Pompea designed and supervised the Eddington Experiment Project. In this project university students designed a telescope/software system to measure the gravitational deflection of light by the Sun. During the total solar eclipse of 2 July, 2019, students from the University of La Serena collaborated with NOIRLab education staff to make measurement at Cerro Tololo Inter-American Observatory, with Nobel Prize winner Kip Thorne as a guest.

Other duties included serving on Ph.D. committees and advising on proposals and special projects including the Old Leiden Observatory project. He also co-authored a chapter for the *Annual Review of Astronomy and Astrophysics* titled "Astronomers Engaging with the Education Ecosystem: A Best-Evidence Synthesis."

**2021-Present Observatory Scientist Emeritus, NSF's NOIRLab
2001-2021 Head of Education and Public Outreach Department, NOAO and
NSF's NOIRLab**

Also, Observatory Public Information Officer, and Manager of Science Education at NSF's National Optical-Infrared Astronomy Research Laboratory. Dr. Pompea had overall responsibility for observatory education, outreach, and public engagement programs in the U.S. and Chile. He directed major astronomy education programs and an average of over 100 local public engagement activities per year.

General duties included the management of the NOAO public web site, public information office, and program creation and management for schools, museums, science centers, and afterschool programs. It also included professional development and training of teachers and museum educators, development of partnerships between educators and scientists, and programs that created research and mentoring experiences for undergraduates. Many of these programs also required our staff to develop and test new instructional materials for teachers, students, amateur astronomers, museum professionals, and the public.

NOAO/NSF's NOIRLab education projects included:

- Einstein Schools Programme (worldwide)
- Project ASTRO (U.S.)
- Undergraduate Mentoring and Outreach Program (U.S.)
- Tohono O'odham Education Partnership Programs (U.S.)
- Colors of Nature Program (U.S.)

- Tourist Observatory Guide Training Program (Chile)
- Professional Development of Preschool Teachers (Chile)
- Darks Skies Awareness Program (worldwide)
- Teen Science Cafes (U.S.)
- Globe at Night Citizen Science Program (worldwide)
- Galileoscope/Teaching with Telescopes (U.S. and Chile)

Recent NSF projects with Pompea as Co-PI included

- "Windows on the Universe Center for Astronomy Outreach" (NSF AST)
- "Collaborative Research: Project STEAM: Integrating Art with Science to Build Science Identities among Girls" (NSF Advancing Informal STEM Learning)
- "Collaborative Research: Advancing Professional Development and Broadening Participation in Informal Science Learning via the Integration of the Science and Art of Color" (NSF Advancing Informal STEM Learning)

PREVIOUS PROFESSIONAL POSITIONS

1993-2002 Principal, Pompea & Associates, Tucson, Arizona, USA

Optical Engineering: Consulted in optical physics, the optical properties of spectrally selective materials, the design of astronomical instrumentation, optical system analysis, and in the characterization of stray light in optical systems. Provided expert witness services in illumination engineering patent infringement cases.

Conducted performance analysis of optical systems and on the optical properties of surfaces for space and ground-based systems. Consulted on the design and development of a variety of high-performance optical systems in projects for NASA, CSA, and the aerospace, medical, and manufacturing industries. Wrote chapter in the *Handbook of Optics* on optical properties of surfaces.

Science Education: Creative consultant on the design and development of innovative, bleeding-edge national science education curricula, instructional materials, exhibits, and programs. Designed programs using educational technology for increasing science literacy. Designed educator resource materials, innovative student activities, and conducted master planning for science centers and museums.

Major project partners included the NASA Classroom of the Future, the NASA Remote Sensing Public Access Center, the Space Science Institute, the University of Arizona, the Lawrence Hall of Science, and the Space Sciences Laboratory at the University of California, Berkeley.

1991-1993 Associate Scientist, Gemini 8-Meter Telescopes Project, AURA, Tucson, Arizona

Responsible for infrared instrumentation development, including adaptive optics, for international project to design and build advanced astronomical telescopes and instrumentation for installation in Hawaii and Chile. Worked on instrument specifications and interfaces as Infrared Instrument Scientist. Member of working groups: Standards and Reliability, Infrared Spectroscopy, Infrared Imaging, and Adaptive Optics. Performed performance analyses for adaptive optics scenarios.

1989-1991 Instrument Scientist, University of Arizona/NASA NICMOS Project

Worked with NICMOS PI, Program Manager, science team members from various universities, NASA Goddard Space Flight Center, and Ball Aerospace in the design of the Near Infrared Camera and Multi-Object Spectrometer for the Hubble Space Telescope. Worked on instrument specifications, interfaces, performance analysis, and science case. Organized science team meetings.

1980-1989 Senior Engineer, Martin Marietta Aerospace, Denver, Colorado

Developed and tested advanced space instruments as part of Payloads, Sensors, and Instruments Section. Created new ultra-black optical materials including an ultradurable the *Enhanced Martin Black* and high-infrared absorbing *Infrablack*

surfaces. Analyzed short and long-term effects of the space environment on novel optical and structural materials, including inflatable space structures. Developed a new design for cryogenically operated motors, and established their reliability and repeatability for use in a liquid helium cooled Cornell/NASA infrared spectrometer.

Founded and led research and development group for stray light baffle materials development for SIRTf, improving the predicted performance of SIRTf by a factor of one thousand. Developed new laser communication techniques for space to earth communication. Served as Earth Observations Lead for international space station mission design team. Project lead on creating the first *Fully Automatic Visible and Infrared Scatterometer* for characterizing the scatter (BRDF) properties of materials. (Part-time employee during graduate school 1984-89)

1977-1980 Science Teacher, Air Academy School District, Colo. Springs, Colorado

Designed and taught courses in physics, astronomy, historical geology, physical geology, physical oceanography, and meteorology for secondary science. Created and taught gifted and talented science class. Received state-level recognition for innovative science teaching. Scored at 99th percentile on National Teacher Examination. Selected as a member of a national faculty for eight summers to teach highly gifted and talented students in the renowned Nebraska Summer Honors Program. Taught special intensive courses in chemistry, physics, astronomy, remote sensing, and geology.

FACULTY APPOINTMENTS

- Visiting Professor, Leiden University (Sabbatical in 2017; 2018-Present)
- Affiliate Professor (formerly Adjunct Associate Professor and Adjunct Associate Astronomer), Steward Observatory, University of Arizona (1992-Present)
- Adjunct Professor, Wyant College of Optical Sciences, University of Arizona (2017-2023)
- Adjunct Professor, Arkansas Center for Space and Planetary Sciences, University of Arkansas (2008-2013)
- Affiliate Faculty, Department of Physics, Colorado State University (1977-1987)

AWARDS AND HONORS

- Dutch Research Council (NWO) Communication Award for IAU100 project team for its reach and international impact in promoting astronomy (2020)
- SPIE Maria J. Yzuel Educator Award. Highest education award given by this professional society for optics education with 18,000 members in over 100 countries (2018)
- Robert A. Millikan Medal, American Association of Physics Teachers, for notable and intellectually creative contributions to the teaching of physics (2016)
- Elected Fellow of the American Association of Physics Teachers (2016)
- Elected Fellow of SPIE–The International Society for Optics and Photonics. For achievements in spectrally selective surfaces and in optics education (2013)
- Elected Fellow of the Optical Society of America (now Optica) for advances in the development and understanding of novel blackbody and spectrally selective surfaces, and for leadership in exemplary national optics education programs (2012)
- Esther Hoffman Beller Medal, Optical Society of America (now Optica), for outstanding contributions to optical science and engineering education (2011)
- Association of Universities for Research in Astronomy Award for Service (2011)
- Tucson Metropolitan Education Commission Crystal Apple Award for outstanding educational performance (2011)
- National Association of Geoscience Teachers Distinguished Lecturer (2007-2010)
- International Year of Astronomy Mani Bhaumik Prize for Excellence in Astronomy Education and Public Outreach (2nd Runner Up) for Galileoscope telescope program (2009)
- Cloudy Nights Telescope Review Gear of the Year Award, for Galileoscope telescope educational kit (2009)
- NASA Group Achievement Award: Creation of Spitzer Space Telescope Observing Program for Students and Teachers (2007)
- National Optical Astronomy Observatory Excellence Award (2005)
- NASA Group Achievement Award: For the creation of the NASA Office of Space Science's National Science Education Resource Directory (2001)

- Martin Marietta Denver Aerospace Distinguished Publication Award (1986)
- Martin Marietta Denver Aerospace Inventor Award for "Creation of highly absorbing infrared baffle materials for space telescopes" (1985)
- Martin Marietta Denver Aerospace Distinguished Publication Award (1985)
- Martin Marietta Denver Aerospace Inventor Award "Innovative Space Laser Communications" (1984)
- Martin Marietta Denver Aerospace Distinguished Publication Award (1984)
- Martin Marietta Denver Aerospace Inventor Award for "Design of Highly Repeatable Cryogenic Spectrometer Grating Motors" (1983)
- Commendations: For NASA remote sensing analysis-International Space Station (1984); for NASA work on Shuttle Infrared Telescope Facility (SIRTF) (1983)
- Patent 4,589,972 (1984) for "Optically black coating with improved infrared absorption and process of formation." This Martin Infrablack coating material was later used to make the most accurate measurement of the Stefan-Boltzmann constant the UK National Physical Laboratory.
- Colorado Secondary School Teaching Award (1979)
- Graduate Student Outstanding Teaching Award, Colorado State University

PROFESSIONAL AFFILIATIONS

- American Association of Physics Teachers (Fellow)
- American Association for the Advancement of Science
- American Astronomical Society
- European Astronomical Society
- International Astronomical Union
- Optica-The Optical Society (Fellow)
- SPIE-The International Society for Optics and Photonics (Fellow)

SCIENCE AND ENGINEERING RESEARCH AND DEVELOPMENT WORK

1. ASTRONOMY RESEARCH

Star Formation in Early-Type Spiral Galaxies

This research formed the basis of my Ph.D. research with George Rieke. It required work at a variety of different wavelength regimes to determine star formation rates in barred and isolated galaxies. My observations included cm wavelength observations at the VLA, mm wavelength observations at the Kitt Peak 12-meter radio telescope, ground-based near-infrared and 10-micron observations, and far infrared wavelength IRAS observations.

Dynamical Evolution of the Earth-Moon System

This project began as a senior independent study project at Rice University with fellow student Peter G. K. Kahn, under the guidance of Professor James Lee Wilson. Our research hypothesized that current and past biological rhythms that we observed in modern *Nautilus* and in extremely well-preserved fossilized shells of nautiloids were astronomically induced. Thus, they could reflect secular changes in the lunar synodic month and in the Earth-Moon distance. Our research on fossil geochronometers traced the dynamical evolution of the Earth-Moon system over 400 million years and led to several publications, including one in *Nature*.



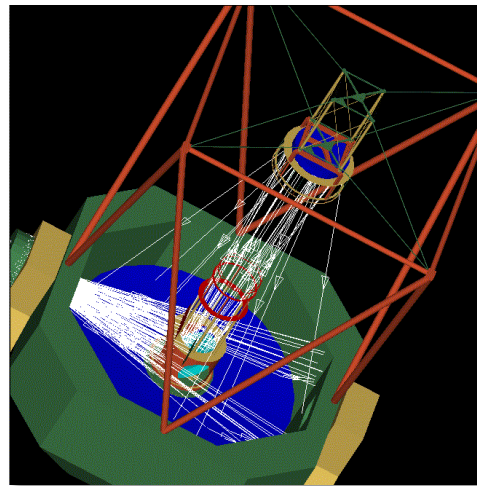
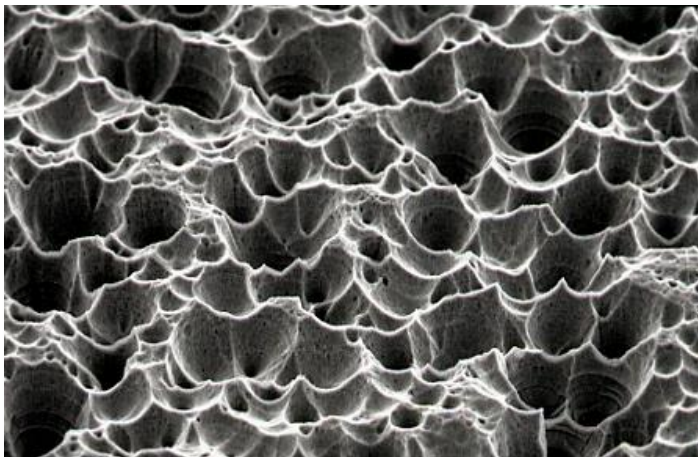
2. ENGINEERING RESEARCH AND DEVELOPMENT PROJECTS

My technical work in spectrally selective surfaces and stray light began with my work on the NASA SIRTf (later Spitzer Space Telescope) mission. Many of my technical projects involved infrared astronomy instrumentation or stray light optimization of optical systems. A number of projects were done later as an independent consultant. I also reviewed the field of spectrally selective materials in an invited chapter in the *Handbook of Optics* and another in the *Encyclopedia of Optics*. Much of the work I have done in this area remains proprietary, but here is a partial listing.

Space-Based Projects

1. The effect of the space environment on very large inflatable orbiting structures (Martin Marietta)
2. Design and development of cryogenic motors for infrared spectrometers for the NASA Space Infrared Telescope Facility. (Martin Marietta, NASA Ames, Cornell)
3. Studies of grating change stepper motor repeatability performance at very low temperatures using optical measurements. (Martin Marietta Denver Aerospace, NASA Ames, Cornell)

4. Development of an advanced laser optical communications system for satellite-submarine communication (Martin Marietta Denver Aerospace)
5. Studies of satellite optical surfaces contamination effects (Martin Marietta)
6. Analysis of effects of the space environment (micrometeoroids, spacecraft charging, solar ultraviolet polymerization and degradation on materials) for large inflatable reflective structures in orbit (Martin Marietta and others)
7. Analysis of earth observations programs and mission requirements for NASA Space Station architectural study (Martin Marietta Denver Aerospace, NASA)
8. Development of spectrally selective surfaces for optical baffles for low-earth orbit applications requiring atomic oxygen resistance (Martin Marietta, NASA.)
9. Testing of new optical baffle surface materials for use in low-Earth orbit on NASA Space Shuttle mission (Martin Marietta Denver Aerospace, NASA)
10. Performance and materials selection study of optical materials for optical spectrograph and infrared imager (OSIRIS) for Canadian Space Agency atmospheric research satellite ODIN (Consultant to ROUTES, Inc. now part of COM DEV)
11. Proprietary study of the long-term effects of the space environment on optical surfaces for space radiators for long-life missions (Consultant)
12. Detailed stray light optical analysis and detailed analysis of on-orbit performance of a proprietary ultraviolet space sensor system (Consultant)
13. Detailed study of optical surfaces for a proprietary on-orbit calibration system for an Earth observing optical system (Consultant)
14. Analysis of the stray light performance of an optical system for searching for extra-solar planets (Consultant)



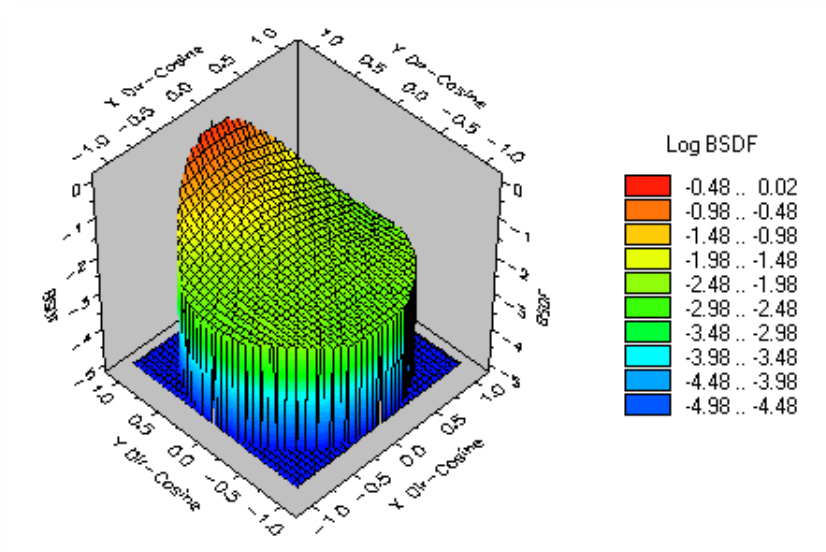
Ground and Airplane-Based Telescopes and Instrumentation

1. Optical analysis and study of the stray light performance of a prototype design of the 2.5-meter Sloan Digital Sky Survey Telescope (Consultant to University of Washington/ARC)
2. Assessment of optical surfaces for near-IR instruments (Consultant)
3. Advanced optical calibration surfaces for ground-based telescopes

- (Consultant)
4. Optical analysis study and selection of coatings for stray light reduction for the NASA SOFIA infrared airplane-mounted telescope. (Consultant)
 5. Optical and stray light analysis of the Apache Point 3.5-meter Telescope/Advanced Camera System (Consultant to Astrophysical Research Consortium/University of Washington)
 6. Selection of spectrally selective surfaces for noise suppression for the Caltech/MIT Laser Interferometer Gravitational Wave Observatory (Consultant)

General Optical Engineering

1. Development of the first *Fully Automated Bi-Directional Visible and Infrared Scatterometer* for measurements of advanced baffle surfaces (Served as Martin Marietta Project Manager to Breault Research Organization)
2. Selection of optical materials for a cryogenic vacuum test application (Consultant)
3. Optical/stray light study of sports arena video screen performance (Consultant)
4. Proprietary development of large area, high-emissivity blackbody radiation sources using carbon nanotubes (Consultant)
5. Selection of baffle surfaces for a mid-infrared production application (Consultant)
6. Modeling/analysis of performance of proprietary ultraviolet illumination systems for several patent infringement cases (Consultant)
7. Identification of approaches and candidate ultra-black surfaces for advanced miniature infrared optical system (Consultant)
8. Design and stray light modeling of a high-quality inexpensive refracting telescope kit (The Galileoscope)



SCIENCE EDUCATION GRANTS

~20 Million Dollars in Total Funding

MAJOR FUNDED PROJECTS

(Most recent first)

1. Title: "Windows on the Universe Center for Astronomy Outreach"

Funding Agency: NSF Astronomy

Co-Principal Investigator: S. Pompea (Transferred upon emeritus status)

Award Period: 5 years, 10/2018 – 10/2023

Total Grant Amount: \$4,500,000

Creation of major new facilities for outreach and visitors at Kitt Peak National Observatory using the iconic McMath Pierce Solar Telescope.

2. Title: "Collaborative Research: Advancing Professional Development and Broadening Participation in Informal Science Learning via the Integration of the Science and Art of Color"

Funding Agency: NSF Advancing Informal STEM Education (AISL)

Co-Principal Investigator: S. Pompea

Award Period: 5 years, 10/2017 –10/2022

Total Grant Amount: \$1,251,726

Professional development with informal and formal educators to create and support innovative art-science programming. Project partners include the Geophysical Institute of the University of Alaska Fairbanks and the University of Washington Bothell. Professional development sites include the Sitka Sound Science Center, Seattle Public Libraries, Pima County Public Libraries, and the Fairbanks North Star Borough School District.

3. Title: "Collaborative Research: Project STEAM: Integrating Art with Science to Build Science Identities among Girls" (Colors of Nature)

Funding Agency: NSF Advancing Informal STEM Education

Co-Principal Investigator: S. Pompea

Award Period: 4 years, 10/2012 –10/2017

Total Grant Amount: \$1,500,000

Research and development of a summer and afterschool program for upper elementary and middle school girls with the University of Alaska and the University of Washington-Bothell that combines art and science We explore light and color as it relates to color in biological systems. The project helps builds a science identity and has an emphasis on groups that are currently underrepresented in scientific careers.

4. Title: "Dark Skies Energy Education Program: Energy Awareness for a Sustainable Future"

Funding Agency: Arizona Public Service Company Foundation

Principal Investigator: S. Pompea

Award Period: 8/01/2012 – 8/01/2013
Total Grant Amount: \$62,761

This standards-based professional development and support program for teachers in Yuma Arizona trained teachers with a NOAO-developed classroom teaching kit on illumination engineering.

5. Title: "Arizona Star Party Project" (follow-on to Hands-On Optics in Arizona)

Funding Agency: Science Foundation Arizona
Principal Investigator: S. Pompea
Award Period: 05/01/2011 – 05/01/2012
Total Grant Amount: \$22,000

This program taught basic optics concepts behind image formation and telescopes in mid-sized communities in Arizona. Teachers received professional development in using the NOAO-developed classroom kit on lens and image formation based on the Hands-On Optics Program Module 3.

6. Title: "Expanding the Hands-On Optics Program in Arizona"

Funding Agency: Science Foundation Arizona
Principal Investigator: S. Pompea
Program Dates: 06/01/2007 – 05/01/2011
Total Grant Amount: \$675,000

This program brought the NSF-funded *Hands-On Optics Program* to afterschool programs at Boys and Girls Clubs in Arizona. We trained leaders at ten program sites in Arizona using the HOO modules.

7. Title: "International Year of Astronomy 2009 in the United States"

Funding Agency: NSF Astronomy Division
Co-Principal Investigator and Project Director: S. Pompea
Award Period: 9/1/2008 – 2/1/2009
Total Grant Amount: \$600,000

I led the U.S. effort for IYA2009 and also chaired the Telescope Kits and Optics Challenges Working Group that developed the Galileoscope telescope and teaching kit.

8. Title: "Astronomy from the Ground Up: Building Capacity in Smaller Informal Science Education Institutions"

Funding Agency: NSF Informal Science Education
Co-Principal Investigator: S. Pompea
Award Period: 4 years, 4/1/2004 – 3/31/2008
Total Grant Amount: \$2,005,603

We created the kits and led the professional development efforts that trained museum educators at over 300 U.S. small museums and science centers.

9. Title: "Investigating Astronomy: A Unique High School Curriculum for All Students"

Funding Agency: NSF Instructional Materials Development

Co-Principal Investigator: S. Pompea

Award Period: 4 years, 4/1/2004 – 3/31/2008

Total Grant Amount: \$1,998,783

We were partners in the development of the first new astronomy textbook for middle and high school funded by NSF in over 20 years.

10. Title: "Track 2 GK-12: Collaboration to Advance Teaching, Technology and Science (CATTS)"

NSF Graduate Teaching Fellows in K-12

Co-Principal Investigator: S. Pompea

Award Period: 5 years, 1/1/2004 – 12/31/2009

Total Grant Amount: \$2,112,283

We partnered with the University of Arizona in this very large (63 students) and very successful program to train science graduate students to work in Tucson public schools.

11. Title: "Promoting Inquiry in Science Education (PRISE)"

Funding Agency: Arizona Dept. of Education, Math Science Partnership/U. Arizona
NOAO Program Director S. Pompea (subcontract from the University of Arizona)

Award Period: 04/2007 – 05/2008

Total Grant Amount: \$62,529

This one-year project served Navajo and Hopi teachers in Northern Arizona. We provided professional development and kits for them to encourage elementary and middle school physical science activities.

12. Title: "Hands-On Optics: Making a Difference with Light"

Funding Agency: NSF Informal Science Education

Co-Principal Investigator and Project Director: S. Pompea

Award Period: 09/01/2003 – 08/31/2007

Total Grant Amount: \$1,738,903

With partners SPIE and OSA, we designed and tested 6 standards-based teaching modules and built the accompanying materials kits that reached over 20,000 middle school students across the U. S. through afterschool and science center programs. This required the creation of 6 extensive curriculum books. To disseminate the program, we conducted 27 2-day workshops for educators across the United States.

13. Title: "Revealing the Invisible Universe: From Nanoscope to Telescope"

Funding Agency: NSF Internships in Public Science Education

Co-Principal Investigator: S. Pompea

Award Period: 5/1/2002 – 4/30/2005

Total Grant Amount: \$455,000

In partnership with the University of Arizona's Flandrau Science Center, we developed special teaching exhibits on infrared light and its use in remote sensing and astronomy.

14. Title: "Teacher Leaders in Research Based Astronomy"

Funding Agency: NSF Teacher Enhancement

Principal Investigator: S. Pompea (replaced previous PI, S. Jacoby)

Award Period: 7/01/2001 – 7/01/2005

Total Grant Amount: \$1,440,122

We trained 20 master teachers from across the U.S. per year on conducting high-level astronomy research with their students using Kitt Peak Observatory telescopes. Their students published their research in a research journal that we started for students.

15. Title: "Astronomy Village: Investigating the Solar System"

(Completed before I came to NOAO)

Funding Agency: NSF Instructional Materials Development, Teacher Enhancement

Co-Principal Investigator: S. Pompea,

Project centered at Center for Educational Technologies, Wheeling Jesuit University

Program Dates 06/01/1997 – 05/31/2007

Total Grant Amount: \$1,248,916

This award-winning educational computer program allowed students to conduct solar system research while building basic science skills.

NATIONAL SCIENCE FOUNDATION SMALL GRANTS (less than \$60K each)

1. Title: "Adaptive Optics Kit Development" 2007 (Lead: S. Pompea)

We developed and tested a standards-based program on teaching the basic principles of adaptive optics to high school students, using a materials kit we designed.

2. Title: "Expansion of GLOBE at Night Program" 2007 (Lead: S. Pompea)

We developed a world-wide citizen science program on sky illumination.

3. Title: "Hands-On Optics in Hawaii" 2006 (Lead: S. Pompea)

We trained educators at 'Imiloa Science Center on the Hands-On Optics modules and provided them with the program modules.

4. Title: "Spanish Language Astronomy Libraries" 2005 and "Spanish Language Astronomy Materials Center" 2003 (Lead: S. Pompea)

We identified, obtained, and reviewed about 400 astronomy and physical science books that are in Spanish, to create this resource center, which later was transferred to a Chilean Public Library near Cerro Tololo.

5. Title: "Best Practices in Native American Science Education" 2003 (Lead: S. Pompea)

We reviewed best practices in this area in order to design an educational program with the Tohono O’odham Nation, where Kitt Peak National Observatory is located.

GRANTS FROM NON-NSF SOURCES

1. “Prototype LSST Big Data Academy for High School Students” 2016 (LSST Corporation) (Leads: C. Walker and S. Pompea)

We developed and tested an innovative program for high school students to interact with astronomical data using computers.

2. “Quality Lighting Teaching Kits” 2015 (IAU, OSA Foundation) (Leads: C. Walker and S. Pompea)

We designed and produced 100 innovative problem-based learning teaching kits for worldwide use, utilizing professional development using short videos we developed.

3. “Aprendiendo Ciencia con el Galileoscopio” (Learning with the Galileoscope) 2013 (SPIE) (Lead: S. Pompea)

We gave workshops in northern Chile to educators on using and teaching with the Galileoscopes with telescopes and tripods provided by the grant.

4. “Dark Skies Outreach to Sub-Saharan Africa” 2013 (International Astronomical Union) (Leads: C. Walker and S. Pompea)

We designed, built, and shipped teaching kits on illumination engineering to African lead educators in twelve countries and provided professional development and support.

5. “Galileo Educator Network” 2102 (NASA, through the Astronomical Society of the Pacific) (Lead: S. Pompea)

This national program trained teacher leaders on the national Next Generation Science Standards.

6. “NOAO/NASA Spitzer Teacher and Student Research Program” 2004 (JPL) (Lead: S. Pompea)

This national program trained 32 teachers and their students to conduct research with the Spitzer Space Telescope using Director’s time on the space telescope. The program had 11 major research projects and produced 31 posters presented at research meetings.

PROFESSIONAL SERVICE ACTIVITIES (SELECTED)

International Astronomical Union

- U.S. National Outreach Coordinator (2018-2020)
- International Project Lead: Einstein Schools Programme, International Astronomical Union (IAU100) 100 Years of General Relativity (2017-2019)
- Executive Committee Working Group on the International Year of Light 2015

National Science Foundation and NSF-Related Projects

- Chair, Thirty Meter Telescope International Workforce, Education, and Public Outreach Advisory Group (2013–2016)
- Member, Large Synoptic Survey Telescope National Outreach Advisory Board (2012–2015)
- NSF COSEE (Committee on Ocean Science Exploration and Engagement) Decadal Review Committee 2011
- NSF Proposal Reviewer (1995-2020)
 - Undergraduate Education (DUE) Program Reviewer
 - Served on NSF panels for Elementary, Secondary, Informal Education (ESIE)
 - Served on NSF Panels for Directorate for Education and Human Resources
 - Review Panel on Research Experiences for Teachers and Students
 - Review Panel on Teacher Enhancement
 - Review Panel on Teacher Professional Continuum
 - Proposal Reviewer NSF Small Business Innovation Research Physics/Astronomy
 - Proposal Reviewer in Geosciences
 - Proposal Reviewer in Astronomy
 - NSF Center and Program Reviewer

Reviewer

- International Astronomical Union's *Astronomy Education Journal*
- *Cuadernos.info* science education journal (Chile) 2021
- Reviewer for *Journal of Science Education and Technology* (Springer Nature) 2021
- U.S. National Science Foundation Special Projects Proposals
- The Optical Society Esther Hoffman Beller Medal Committee (2020, 2021)
- Creative Education Journal (2020)
- Reviewer, Las Cumbres Observatory Education Proposals (2018)
- Reviewer, proposals submitted to CONICYT, The Chilean National Commission for Scientific and Technological Research (2014, 2017)
- Judge and reviewer, American Association for the Advancement of Science (AAS) Science Prize for Inquiry-Based Instruction (2011, 2012, 2013)
- University of Arizona Community Connection Grants (2012)
- Review of Scientific Instruments (occasional)
- Journal of Optical Engineering (occasional)
- Applied Optics (occasional)

- Astronomy Education Review

Advisory Boards

- Oude Sterrewacht Begeleidingscommissie (Leiden University Old Observatory Guidance Committee)
- NSF Astronomy in Chile Educator Ambassadors Program (2014-present)
- International Advisory Board, The Harbour School, Hong Kong (2012-present)
- Arizona Center for STEM Teachers, University Support Committee (2009-2012)
- National Advisory Board, Sharing the Universe (Astron. Soc. Pacific, NSF ISE) (2008-2011)
- National Advisory Board, Photon II, NSF Advanced Technology Education Project (2003-2008)
- National Advisory Board, Communities for Physics and Astronomy Digital Resources in Education (ComPADRE) (project with AAS, AAPT, APS, the American Institute of Physics/Society of Physics Students) (2003-2008)
- National Education Advisory Board, NASA Stratospheric Observatory for Infrared Astronomy (2002)
- Astronomy Education Review (AER) Council of Advisors (2002-2013)
- National Advisory Board, NSF Earth and Space Science Technological Education Project (1997)
- Advisory Board, University of Arizona Science and Mathematics Education Center (SAMEC) (2004-2007)
- Member of Board of Directors and Education Co-Chair, Arizona Optics Industry Association (1996-2016)

Instructional Materials or Textbook Reviewer

- NASA Earth and Space Science programs and instructional materials (2012)
- Universities of Arizona and Washington NSF-STC Materials and Devices for Information Technology Research (MDITR) (2004)
- American Geological Institute's NSF-funded *EarthComm* (Earth System Science in the Community) National earth science curriculum project (2001)
- Democritus University of Thrace, Physics educ. multimedia materials (1998-99)
- Greek government: Light pollution education program (1998)

Optics and Photonics (Education)

- Program Committee, Education and Training in Optics and Photonics 2019
- Organizing Committee, SPIE Eco-Photonics: Education for a Sustainable Engineering Workforce for a Green Future, Strasbourg, France, March 28-30, 2011.
- Organizing Committee, 10th International Conference on Education and Training in Optics and Photonics (ETOP), Program Committee Ottawa, Canada, 3-5 June 2007.

- Organizing Committee, 9th International Conference on Education and Training in Optics and Photonics (ETOP), Program Committee, Marseille, France, October 23-27, 2005
- Steering Committee, 8th International Conference on Education and Training in Optics and Photonics (ETOP), October 6-8, 2003, Tucson, Arizona
- Board of Directors and Education Co-Chair, Arizona Optics Industry Association (1996-Present)
- Invited Member, Coalition for Photonics & Optics (CPO), an organization of 30 CEOs of Optics and Photonics Companies, 1996-2003.

Optics and Photonics (Technical)

- Meeting Co-Chair/Editor: "Stray Light and System Optimization: Theory, Surface Spectral Characteristics, and Techniques," SPIE, The International Society for Optical Engineering, International Symposium on Optical Science, Engineering, and Instrumentation, Aug. 4-9, 1996.
- Session Chair: Stray Light Analysis and Measurement, Conference on Stray Radiation in Optical Systems III, SPIE, The International Society for Optical Engineering, July 1994.
- Session Chair: Stray Light Theory and Concepts, Conference on Stray Radiation in Optical Systems II, SPIE, The International Society for Optical Engineering, July, 1992

American Geophysical Union

- Chairperson: Session on "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom II," American Geophysical Union Meeting, San Francisco December 3, 2012.
- Chairperson: Session on "Public Participation in Citizen Science Research," American Geophysical Union Meeting, San Francisco December 3, 2012.
- Chairperson: Poster Session on "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom II," American Geophysical Union Meeting, San Francisco December 9, 2011.
- Chairperson: Session on "Public Participation in Research: Multiple Approaches, Multiple Audiences for Engaging Citizen Scientists in Geoscience Research II," American Geophysical Union Meeting, San Francisco December 8, 2011.
- Chairperson: Session on "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom I," American Geophysical Union Meeting, San Francisco December 7, 2011.
- Chairperson: Poster Session on "Public Participation in Research: Multiple Approaches, Multiple Audiences for Engaging Citizen Scientists in Geoscience Research I," Sessions at American Geophysical Union Meeting, San Francisco December 6, 2011.
- Session Chair: "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom Sessions I, II, and III," Sessions at American Geophysical Union Meeting, San Francisco December 17, 2010.

- Session Chair: "Public Participation in Geoscience Research: Engaging Citizen Scientists," Sessions I and II at American Geophysical Union Meeting, San Francisco, December 13, 2010.
- Presider: "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom," Session at American Geophysical Union Meeting, San Francisco December 16-17, 2009.
- Presider: "International Year of Astronomy 2009: Impacts in Education and Public Outreach and Plans Beyond," Session at American Geophysical Union Meeting, December 18, 2009.
- Presider: "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom II," Session at American Geophysical Union Meeting, San Francisco, December 2008.
- Presider: "Promoting Student Inquiry Using Real Scientific Data in Science Curriculum III," Sessions at American Geophysical Union Meeting, San Francisco, December 2007.
- Presider: "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom" Sessions at American Geophysical Union Meeting, San Francisco, December 2004.
- Presider: "Teacher Professional Development Programs Promoting Authentic Scientific Research in the Classroom" Sessions at American Geophysical Union Meeting, San Francisco, December 2003.
- Co-Chair, American Geophysical Union Education Session, San Francisco, December 2002.

American Astronomical Society

- Session Chair IYA2009 and Beyond: Outreach and Citizen Science Programs, AAS, Pasadena California, June 9, 2009
- Session Chair, "IYA2009 Outreach: Reports from the Field," AAS, Pasadena California, June 10, 2009
- Co-Organizer, "Engaging Students: IYA2009 and Research," AAS, Long Beach, California, January 4-8, 2009.
- Co-Organizer, "International Year of Astronomy Opening Event," AAS, Long Beach, California, January 6, 2009.
- Plenary Session Co-Chair, Astronomical Society of the Pacific Symposium on "Preparing for the International Year of Astronomy," AAS, St. Louis, Missouri, June 4, 2008.
- Session Co-Chair, "In the Footsteps of Galileo, Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy," AAS, St. Louis, Missouri, June 3, 2008.

American Association of Physics Teachers

- Session Chair, "Demonstrations for Teaching Astronomy," American Astronomical Society/American Association of Physics Teachers, Seattle January 10, 2007.

- Member, Astronomy Education Committee, American Association of Physics Teachers 1999-2002.
- Presider, Contributed Session on "Astronomy as a Tool for Public Outreach," American Astronomical Society/American Association of Physics Teachers, San Diego, January 10, 2001.
- Presider, Invited and Contributed Session on "Astronomy: A Tool for Public Outreach." American Association of Physics Teachers, Kissimmee, Florida, January 17, 2000.
- Presider, Invited and Contributed Session on "Astronomy: A Tool for Public Outreach," American Association of Physics Teachers, Anaheim, California, January 5, 1999.
- Presider, Invited and Contributed Session on "Astronomy as a Tool for Public Outreach," American Association of Physics Teachers, New Orleans, January 6, 1998.
- Presider, Invited and Contributed Session on "Astronomy: A Tool for Public Outreach," American Association of Physics Teachers, Phoenix, Arizona, January 7, 1997.

Astronomical Society of the Pacific

- Astronomical Society of the Pacific Annual Conference Program Committee, August 2014
- Astronomical Society of the Pacific Annual Conference Session Chair: "Improving Our Professional Practice," August 2014
- Astronomical Society of the Pacific Annual Conference Program Committee, August 2011
- Nominating Committee, Astronomical Society of the Pacific (Term 2006-2009, Chair 2009)
- Astronomical Society of the Pacific, Annual Conference Program Committee, September 2008
- Astronomical Society of the Pacific, Annual Conference Program Committee, September 2007
- Astronomical Society of the Pacific, Annual Conference Program Committee, September 2005
- Astronomical Society of the Pacific *Cosmos in the Classroom* 2004 Organizing Committee

KEY SCIENCE EDUCATION PROJECTS

This section describes some educational projects at NOAO (now NSF's NOIRLab) designed, created, and led by Dr. Pompea. Most of these projects are "leading edge" or "bleeding edge" projects. They meet the NSF requirement that projects have significant intellectual merit as well as broader impacts. The intellectual merits of the NOAO EPO projects fall into the five key areas described below.

A. Intellectual Merit Area: Advancing Astronomy Instructional Materials Development

Galileoscope Kit and Educational Programs

Dr. Pompea chaired the U.S. Telescope Kits and Optics Challenges working group for the International Year of Astronomy 2009 which did the initial needs and manufacturability assessment for the creation of an affordable, high-quality telescope. He was involved in the overall design, development, testing, manufacturing, and distribution effort



that created the Galileoscope, in collaboration with R. Fienberg (American Astronomical Society) and D. Arion (Carthage College). The project has produced over 240,000 small telescope kits.

The NOAO group is leading the ongoing educational program for Galileoscopes under the auspices of NOAO's Teaching with Telescopes program, started by Pompea.

A professional development and teaching kit (Teaching with Telescopes) was developed for use with the Galileoscope and has been used nationally and



internationally with teachers. This kit teaches the basic optics principles behind the Galileoscope and demonstrates the principles of image formation. NOAO has trained hundreds of teachers using this teaching kit and brought this program all over Arizona as part of the Arizona Galileoscope program.

The Galileoscope was also named one of the key projects worldwide for the International Year of Light 2015.

Role in Project: Leader of U.S. Telescope Kits and Optics Challenges Working Group, and lead optical designer of the Galileoscope and its educational programs.

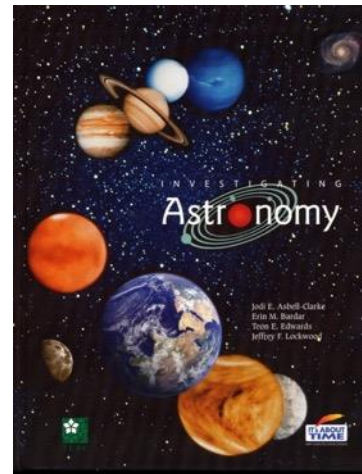
Investigating Astronomy: A Unique High School Curriculum for All Students

Partners: TERC and the Astronomical Society of the Pacific. Funder: NSF Instructional Materials Development

Duration: 4 years

Status: Project completed

The *Investigating Astronomy* book developed the first new astronomy high school curriculum funded by NSF in over 20 years. The curriculum is a standards-based, technology-rich comprehensive high school curriculum in astronomy. NOAO had primary responsibility for bringing current astronomical research into the textbook and its associated materials in order to reflect the astronomy research process and current research in astrophysics. NOAO also had responsibility for translating community-based materials into Spanish.



Role in Project: NSF Project Co-PI and NOAO Team Leader

Giant Segmented Mirror Telescope EPO Program

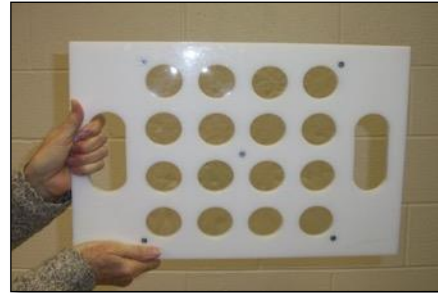
During the design and development phase of GMST, Dr. Pompea began the development of a new online, inquiry-based educational module on site selection where students evaluate different sites for seeing, general weather, logistical issues and cost. Also begun was the development of the framework of an additional module on systems engineering (specifically enclosure selection) and as it relates to the design and development of an extremely large telescope (ELT) like the GMT or TMT. Basic systems issues are addressed and studied by students working in

collaborative groups to study system tradeoffs. The educational structure of these modules resembled the thematic architecture known as "Astronomy Village" where students play an active role in scientific research. These educational units on system engineering were not completed due to the cancellation of the project.

Role in Project: Project Leader and Designer

Adaptive Optics Teaching Kit

NOAO created a new module and kit of hands-on activities in adaptive optics, and related concepts, as part of an expansion of the highly successful SPIE-OSA-NOAO Hands-On Optics informal science education project. Our goal was to create engaging, fully self-contained activities in optical engineering for the after-school and museum environment. These include ways to teach about Shack-Hartman sensors and deformable mirrors. We also created an activity related to tip/tilt mirrors and laser beam pointing control.



These activities were standards-based and provided high school teachers with the background to explore the basic ideas of adaptive optics. Due to a cutoff in funding, a national program to train teachers and distribute these completely developed modules is on hold.

Role in Project: Project Leader

B. Intellectual Merit Area: Engaging in Authentic Astronomical Research

Teacher Leaders in Research Based Science Education

Funder: NSF Directorate for Education and Human Resources
Teacher and Student Research

This NOAO program trained over 130 teachers nationally on astronomical research through a thirteen-week distance learning course and a 10-day summer research institute. Four research projects (AGN, Novae, Solar Magnetic Fields, and Stellar Spectroscopy) on Kitt Peak and Sacramento Peak were supported. TLRBSE worked to retain and renew middle and high school teachers of science and mathematics by integrating the best practices of Research Based Science Education with the process of mentoring. Participants were provided training in astronomy content, pedagogy and leadership skills. The TLRBSE program developed master teachers in research-based science education and prepared them as leaders in their schools. Student research was emphasized and students



published their research in the *Research Based Science Education* journal, published at NOAO each spring.

Role in Project: Served as PI for 4 years after Suzanne Jacoby. Dr. Pompea led the transition of the project to a NOAO core-funded project called Astronomy in Research Based Science Education.

NOAO Teacher Observing Program (TOP)

Funding: Initially by TLRBSE NSF funding. Later through core funding
As part of efforts to support teacher and student research, I led efforts to create the Teacher Observing Program (TOP) that allowed secondary school teachers who have participated in the TLRBSE and RBSE (the precursor program) to propose observing projects using Kitt Peak Observatory facilities. Teacher-student teams write proposals, present their proposals for critical review by NOAO astronomers, and if approved, they observe at Kitt Peak National Observatory. The program allows astronomy research to be the core element of projects presented at the International Science and Engineering Fair.

Role in Project: Program initiation, including design and creation. The program was run by Dr. Katy Garmany.

NOAO/NASA Spitzer Observing Program for Students and Teachers

Funding: NASA

In 2004, Dr. Pompea led the design and partnering effort with the Spitzer Science Center in Pasadena to train and provide observing opportunities for teachers and students on a space infrared telescope. These teachers had observing proposals for the Spitzer Space Telescope in collaboration with astronomers at NOAO (most notably Steve Howell and Greg Rudnick) and the Spitzer Science Center.



Thirty-two teachers (in four proposal rounds) participated in eleven research projects using Director's Discretionary time with this space infrared telescope. Thirty-one posters on the research results have been presented at AAS meeting by the teacher teams. This program has now evolved into an archival data-based program (NITARP) at the Spitzer Science Center.

Role in Project: Program creation, leadership, and management

Quality Lighting Teaching Kit

This NOAO project was rated the highest of over 30 proposals for the IAU Cosmic Light program for the International Year of Light 2015. Under the sponsorship of IAU and with additional funds from the Optical Society Foundation, we designed, tested, and created 100 kits that were distributed to 89 partners in 31 countries. We worked with the OSA, SPIE, CIE, IDA and the IAU Office of Astronomy Development. Our kit has an associated website, activity posters, instructor's guide, tutorial videos, and uses Google+ Q&A hangouts for professional development. The kit asks students to solve lighting problems of their city and a city of the future and uses a problem-based learning approach.

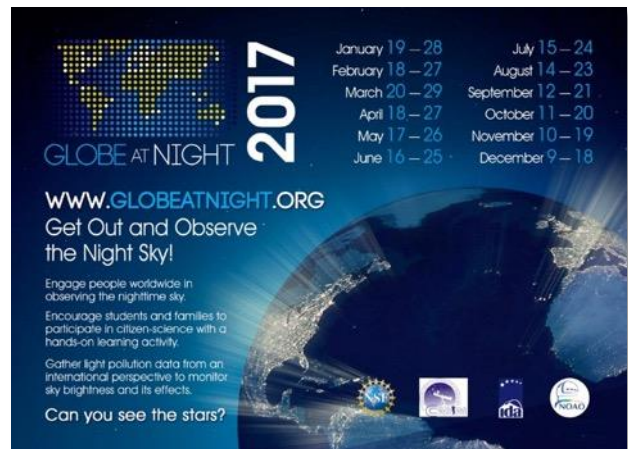
Role in Project: Co-PI with Dr. Connie Walker, kit and program design.



GLOBE at Night

This is a worldwide light pollution citizen science education program started with the NASA/NSF Global Learning and Observation to Benefit the Environment (GLOBE) program in Boulder in order to extend NOAO's dark skies programs started by Dr. Connie Walker. Other original partners were CADIAS-Chile, ESRI, and UCAR Windows to the Universe. The program was prototyped March 2006 with 18,000 participants. Each subsequent campaign has been much larger and a grant for Sky Quality Meters was obtained from NSF. The project formed the basis for a key International Year of Astronomy program.

Role in Project: Program initiation. Created strategic project plan with the GLOBE Director Dr. Craig Blurton and initiated prototype program now expanded significantly and run entirely by NOAO under the direction of Dr. Walker.



C. Intellectual Merit Area: Teacher Professional Development through Collaboration with Scientists

Project ASTRO

Dr. Pompea was a past director of Project ASTRO-Tucson, part of the national network of Project ASTRO sites. This teacher-scientist partnership program sponsored by the Astronomical Society of the Pacific has NOAO as a flagship



site for Project ASTRO nationwide. Nearly 50,000 students have been engaged since program inception with 300 participants still active. Over 250 schools have been represented in the project. NOAO is playing a leading role in the Galileo Educator's Network which is working with the other 15 Project ASTRO sites nationally in an NASA sponsored project run by the Astronomical Society of the Pacific. The NOAO Project ASTRO program is now



run by Robert Sparks of the EPO group.

Role in Project: Past Director and past NOAO lead on NASA Galileo Educator Network. Rob Sparks is the current NOAO ASTRO Director.

ASTRO-Chile

ASTRO-Chile was a teacher/student program between NOAO North and South that utilizes internet-based videoconferencing for professional development and student communication. The project has created projects on light pollution, remote sensing, and spectroscopy. For example, the project used a Mars rover constructed by an NOAO REU student for educational work at the CADIAS astronomy center in Chile. ASTRO Chile collaborations have also led to a vigorous program on Galileoscopes in Chile.



Role in Project: Program Designer

Collaboration to Advance Teaching, Technology, and Science (CATTS)

Funder: NSF GK-12 with the University of Arizona as the lead. CATTS is widely considered as one of the most successful GK-12 programs in the country and completed an NSF 5-year renewal grant. CATTS created new models of how graduate students in science can work in public schools. During the renewal grant, 63 CATTS Fellows (science Ph.D. candidates from the University of Arizona) were trained and worked in public schools, each for 15 hours per week for a period of one year.



Role in Project: NSF Project Co-PI and NOAO Lead

D. Intellectual Merit Area: Innovative Approaches in Informal (Out of School) Science Education Programs

Collaborative Research: Advancing Professional Development and Broadening Participation in Informal Science Learning via the Integration of the Science and Art of Color

(NSF AISL funded, ongoing dissemination grant with partners named below)

Collaborative Research: Project STEAM: Integrating Art with Science to Build Science Identities Among Girls

Funder: NSF Informal Education, 2012-2017

NOAO has partnered with the University of Alaska Fairbanks, the University of Alaska Museum of the North, and the University of the Washington-Bothell to bring biomaterials, optics, photonics, and nanotechnology content, art infused experiences, and career awareness to art-interested girls. As a full-scale development project, Project STEAM explores the intersections between biology, physics, and art. Middle school girls (many from predominately underrepresented Alaskan Native, Native American, and Hispanic groups), their families, teachers, and afterschool educators participate in the project. The Summer Academies are conducted done both in Fairbanks and in Tucson each summer. The project's research component has addressed how girls form a science identity.



With the theme of "Colors of Nature," Project STEAM engages girls in science activities designed to enhance STEM learning and visual-spatial skills. The project reached 240 girls in the Summer Academies as participants work with women scientist mentors to develop design projects.



Role in Project: NSF Co-PI, Lead for NOAO

Hands-On Optics: Making an Impact with Light

Funder: NSF Informal Science Education, with SPIE and OSA as partners, 4-year project completed December 2007.)

NOAO played the largest role in HOO, developing, testing, building, and distributing the 6 informal optics modules and their associated kits for middle school age students in after-school programs and science centers across the country.



Over 60% of the 20,000 students served were from groups traditionally underserved in science and math education.

NOAO also trained all of the educators and optics volunteers in the project, completing over 30 two-day workshops spread across the country. For example, project trainings took place at USC, Lawrence Livermore National Laboratory, Tucson, Longmont (Colorado), Albuquerque, California Science Center (Los Angeles), Chabot Science Center (Oakland), New York Hall of Science, Baltimore, and in Boston.

The Hands-On Optics project was judged as an exemplary informal science education project and is featured in the National Science Teachers Association monograph on exemplary informal education projects.

Role in Project: National Project Director, NSF Project Co-PI, and instructional materials tester and developer

Expanding the Hands-On Optics Project in Arizona: K-12 Innovation Experience Program

Funder: Science Foundation Arizona, started May, 2007, renewed for second and third years, now completed).

The project brought the national Hands-On Optics project and materials developed at NOAO to ten rural Boys and Girls clubs in Arizona. The sites included Kitt Peak Visitor's Centers, Sells, Sierra Vista, Fort Huachuca, Yuma, and Prescott.

NOAO trained activity leaders and provided support for extended optics education programs for young students at these sites. We also ran the program at the Boys and Girls Clubs in Tucson.

Role in Project: Project PI/Director

Arizona Galileoscope Project

Funder: Science Foundation Arizona

This project was designed to promote interest in science in 5th grade students through star parties using Galileoscopes. The project model had every 5th grade teacher receiving professional development on teaching optics and telescopes and every 5th grade student in a team building and using a Galileoscope. The project has been implemented in Flagstaff Yuma, Safford, and Globe. Each teacher received an extensive kit for teaching about telescopes.

Role in Project: Project PI and lead



Astronomy from the Ground Up: Building Capacity in Smaller Informal Science Education Institutions

Funder: NSF Informal Science Division. Four-year project started April 2005. Completed. Partners: Astronomical Society of the Pacific and the Association of Science Technology Centers

This project provided a new national model for professional development of science center personnel at small and medium sized centers nationwide. The project trained over 300 informal science education practitioners and built astronomy education capacity over 200 smaller informal science education institutions through both face-to-face workshops and through distance-learning workshops.

Role in Project: NSF Project Co-PI

Family ASTRO

Funder: startup grant from NSF/ASP

This project trained leaders to deliver community-based and family-based astronomy programs in Tucson and the surrounding areas. The program is based on materials developed at the Astronomical Society of the Pacific as part of an NSF-funded project.

Role in Project: Project Director

Centro de Apoyo a la Didáctica de la Astronomía (CADIAS)

I helped develop CADIAS as an astronomy teaching and outreach center. The center is located on the road to CTIO and conducts an array of vigorous and productive programs schools as well as professional development for teachers. Its portable planetarium program reaches many parts of Chile.

Role in Project: Creation and high-level supervision of the CADIAS facility; played a large role in the creation of the CADIAS astronomy library, which is now a Chilean public library.



Revealing the Invisible Universe: From Nanoscopes to Telescopes

Funder: NSF Informal Science Education, with University of Arizona's Flandrau Science Center, 3 years duration, completed in 2005

This project developed a national model for training interns to develop programs and exhibits at a science center. NOAO worked closely with the interns to develop programs that discussed infrared astronomy and the discoveries that have been made with infrared telescopes.

Role in Project: NSF Project Co-PI

Chile Municipal and Tourist Observatory Guide Training Program

I helped initiate a program at NOAO South that works with municipal and tourist observatories in Chile to train and certify their astronomy guides. These observatories are popular throughout the Region of Coquimbo and include the Observatorio Mamalluca in Vicuña, Observatorio Cruz del Sur in Combarbalá, Observatorio Collowara in Andacollo. The tourist observatories serve small municipalities and tourists in dark sky regions of Chile. The staff of these observatories are often



amateur astronomers and the management is usually done by non-astronomers who are city employees. NOAO has provided eyepieces, binoculars, outreach material, and technical assistance to these observatories as well as a formal training course offered through the University of La Serena.

Role in Project: Program creation and high-level supervision

E. Intellectual Merit Area: New Strategies for Working with Groups Underrepresented in the Science, Technology, Engineering, and Mathematics (STEM) Fields

Spanish Language Astronomy Education Materials Center

Completed with NSF seed money

The project's goal was to locate and obtain astronomy materials in Spanish. The project created a library of reviewed materials and a web-based catalog of generally available Spanish-language astronomy materials for all grade levels. These web pages are meant to provide a user-friendly way to find grade level-appropriate astronomy education materials.



This project assembled over 500 educational resources in astronomy and related fields from the preschool to early college level, with most of the materials were described in some detail and/or reviewed. The Chilean library is located at CADIAS.

Role in Project: NSF PI and Lead

Native American Educational Materials Center

Funder: NSF seed money, completed

This project explored best practices and educational materials for working with Native American groups, especially Tohono O'odham and Tohono O'odham Community College.

These efforts have led an expanded program with the Tohono O'odham Nation and a greater awareness of the nature of collaborative projects with the Nation.

Role in Project: Project PI



Promoting Inquiry in Science Education (PRISE)

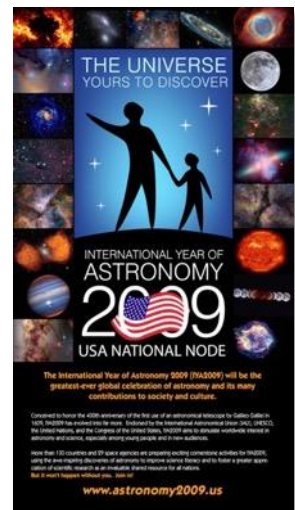
Funder: Arizona State Dept. of Education (Started April, 2007, one year)
This project delivered professional development to elementary and middle school teachers on the Navajo and Hopi Nations. It was a collaborative effort with University of Arizona, Navajo Nation Office of Dinè Science, Math and Technology, and the Piñon Unified School District. NOAO EPO staff organized the professional development workshops, selected instructional materials, and travelled eight times to Piñon Arizona on the Navajo nation to deliver 14 hours of professional development on each trip. The project utilized GEMS guides as instructional materials and NOAO build GEMS materials kits for the teachers. The project finished in Spring, 2008.



Role in Project: NOAO lead

International Year of Astronomy

Funder: NSF grant, with the American Astronomical Society
This program was designed to reach diverse groups through a wide array of projects in 2009 and beyond. The NOAO project office organized a diverse set of grass roots projects including high successful image exhibitions, dark skies education, and public observing projects. NOAO organized and coordinated projects nationwide and participated in the first ever White House Star Party in October 2009.

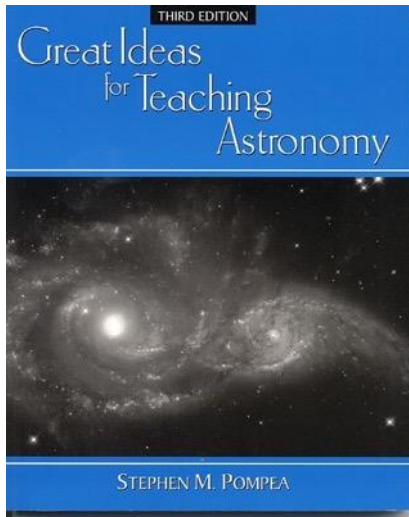


Role in Project: National Project Director, and NSF Co-PI

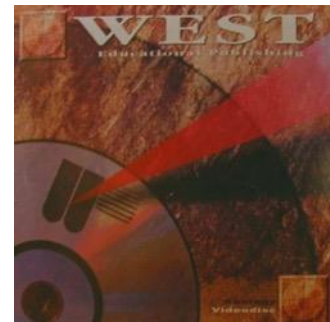
Previous Science Education Work

Most of the projects described below were done in the eight plus years of educational consulting I did before I came to the National Optical Astronomy Observatory.

Book Projects with West Publishing/Brooks Cole



- Editor: *Great Ideas for Teaching Astronomy, 3rd edition*, Brooks/Cole, 2000.
 - Editor: *Current Perspectives in Physics and Astronomy* (West Publishing, 1995)
 - Author: Teacher's Manual to *In Quest of the Universe, 2nd edition* (college astronomy textbook, West Publishing, 1995)
 - Author: *Astronomy through Image Processing* (West Publishing). Image processing and its application to astronomy were described through exercises devoted to increasing astronomy knowledge on modern topics and through problem-based learning exercises.
- Significant contributor to *Great Ideas for Teaching Geology*, West Publishing.
 - Significant contributor to *Great Ideas for Teaching Physics*, West Publishing
 - *Teaching Activities with RealSky* (with J. Lockwood) Print/CD-ROM developed for the Astronomical Society of the Pacific. Image processing activities using the astronomical *RealSky* CD-ROM set (unpublished).
 - Consultant to West Publishing on three projects: the creation of a Videodisk on Geology; a multimedia project on astronomical supercomputer simulations; and a poster on astronomy misconceptions.



Earth Systems Science Course for Middle School Teachers

NASA Classroom of the Future, Wheeling Jesuit University

Assisted in the initial planning and selection of teaching resources and units for this Internet-based course first offered Spring, 1997 and then replicated for nationwide distribution. This was one of the first national professional development course delivered via the web. This course developed many of the standard practices used in today's on-line courses including the combination of synchronous and asynchronous discussions to reinforce key concepts.

NASA Educational Broker/Facilitator Program

Dr. Pompea was a partner with the Space Science Institute in Boulder in their NASA Broker/Facilitator program working with scientists on space science education program development. He has presented a segment on multimedia development and teaching with technology at the annual NASA sponsored workshop for scientists held for the six years. As part of this effort, he has co-authored a guide to educational multimedia development and another guide to teaching about technology and engineering design processes.



NASA Sun-Earth Connection/University of California, Berkeley Projects: Great Explorations in Math and Science

Pompea was a partner with the NASA Goddard Space Flight Center and the Center for Science Education at the Space Sciences Laboratory at the University of California, Berkeley in NASA's Sun-Earth Connection Education Forum. This educational effort identified and created educational resources and involved collaborative efforts between the Space Sciences Lab, Pompea, the Exploratorium, and Lawrence Hall of Science. In 2001 a NASA Group Achievement Award was given for this effort.

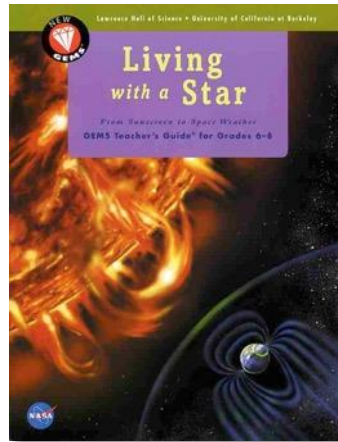
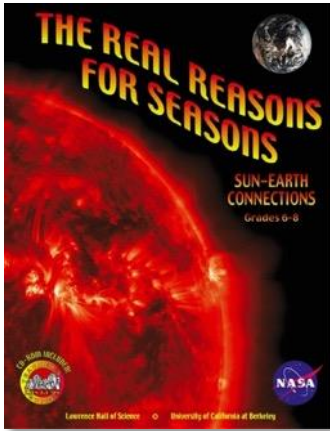


Under the sponsorship of the NASA Sun-Earth Connection Education Forum Dr. Pompea co-authored the GEMS guide produced by Lawrence Hall of Science titled "The Real Reasons for Seasons: Sun-Earth Connections," which includes a CD-ROM

(the first GEMS guide to include one). The guide was published in December, 2000.



Dr. Pompea was a co-author on a second GEMS guide and CD-ROM, *Living with a Star*, emphasizing living with our star, the Sun and space weather. He is also a co-author on a third GEMS guide on the electromagnetic spectrum titled "Invisible Universe," which has been named as an exemplary resource by NASA and others. These were all developed in conjunction with Lawrence Hall of Science and the Center for Science Education at the University of California, Berkeley Space Sciences Lab.



The CD-ROM includes articles, web links, movies, simulation software, extensions, teaching advice, misconceptions about the seasons, and demonstrations.

Astronomy Village: Investigating the Universe Multimedia CD-ROM

This project developed an award-winning CD-ROM and Instructor's book under NASA funding at the NASA Classroom of the Future, Center for Educational Technologies at Wheeling Jesuit University. Dr. Pompea worked closely with Project Director Dr. Craig Blurton on the overall design of the ten investigations. He also contributed lectures, articles, astronomical images, thought experiments, and hands-on classroom activities for the ten student investigations on the CD-ROM. He coordinated and recorded 10 astronomical mini-lectures by leading astronomers, created 10 astronomical data sets suitable for image processing, helped design the observatory interface, and served as host on the introductory videotape.

Dr. Pompea developed a teacher professional development workshop presented at the Center for Educational Technologies and at the American Association of Physics Teachers meetings. He also worked closely with Dr. Namsoo Hong (now at University of Michigan), who did her dissertation on student problem solving using the Astronomy Village package.

Astronomy Village Student Investigations

- | | |
|------------------------------|--------------------------------------|
| Search for a Supernova | Search for Planetary Building Blocks |
| Wedges of the Universe | Search for Nearby Stars |
| Looking at a Stellar Nursery | Search for Earth-Crossing Objects |
| Search for a "Wobbler" | Extragalactic Zoo |
| Variable Star Observatory | Observatory Site Selection |



Awards: *Astronomy Village: Investigating the Universe* received one of *Technology & Learning* magazine's 1996 School Award for Excellence at the 14th Annual Software Awards Presentation in Atlanta. The *Astronomy Village* was also nominated for a *ComputerWorld* Smithsonian Award and has been featured in reviews in *Astronomy*, *Technology and Learning*, and the *New York Times*. Over 15,000 copies of this program have been distributed. This was the first educational product to use simulated email and to include Netscape 1.0.

Astronomy Village: Investigating the Solar System

Dr. Pompea was a Co-I on this NSF-funded Instructional Materials Development project with S. McGee and S. Croft at the Center for Educational Technologies, Wheeling Jesuit University. Investigational activities were developed and tested for middle school students. Dr. Pompea was involved in module development, alpha and beta testing of the modules, and in project planning, assessment, and research efforts. Investigations are based on a learning cycle model that incorporates science process. Nine modules were developed and tested for students in grades 5-7. *Astronomy Village: Investigating the Solar System* was a finalist for the Distinguished Achievement Award for exceptional content and delivery given by the Association of Educational Publishers.



The investigations emphasize the requirements necessary for life on Earth. Students look for life in the deep ocean, hot springs, and in the Earth's polar regions to gain an understanding of the basic prerequisite conditions for life to exist. Students then search for life in the solar system using spectroscopy and remote sensing techniques. For example, one investigation uses near infrared

imaging to search for the infrared signature of chlorophyll.

In another set of investigations students explore planetary surfaces and atmospheres to gain an understanding of volcanic and tectonic processes. The students use a variety of simulations to understand the basic processes that shape each planet. They then apply this knowledge to a planet we know very little about—Pluto.



Exploring the Environment Project

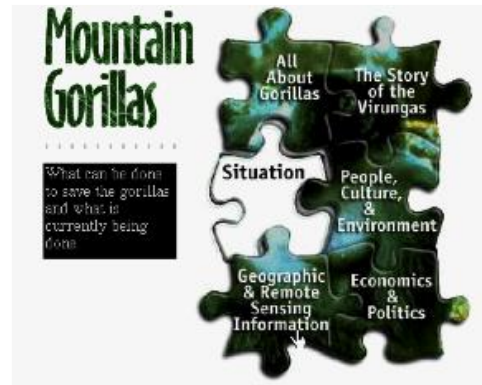
NASA Classroom of the Future, Center for Educational Technologies, Wheeling Jesuit University

Internet-based Problem-Based Learning Modules

Dr. Pompea served as a consultant to this award-winning NASA-sponsored project to promote the use of remote sensing data in education. Dr. Pompea contributed significantly to the intellectual content of the project and developed learning modules as well as teacher resource materials. He was also involved in alpha and beta testing, in teacher professional development workshops, and in dissemination efforts. He had primary responsibility for planning and nearly complete development of several modules:



- Rift Valley Fever Module: Using remote sensing to prevent an epidemic of Rift Valley Fever and other mosquito-borne diseases in Africa.
- Mountain Gorilla Habitat Module: Searching for new gorilla habitat using satellite imagery. Understanding the economic and political factors that threaten mountain gorillas in Rwanda.
- Weather Prediction Module: Making and testing satellite-based weather predictions.
- Everglades Module: assessing urban sprawl and its effects on wetlands using satellite imagery.



BioBLAST®: Better Learning through Adventure, Simulation, and Telecommunications

NASA Classroom of the Future, Center for Educational Technologies, Wheeling Jesuit University

BioBLAST® is a sophisticated computer-based biology education program based on an advanced simulation of a Controlled Ecological Life Support System (CELSS) at a lunar base. In this award-winning CD-ROM students used knowledge of human nutrition and plant biology to become "space farmers" growing their own food. Their challenge was to design and test their own models of a life support system that was plant-based and could sustain a crew of six for three years.

To test their systems, the students "live" in a virtual research facility on the Moon. In this facility they manipulated simulators and used online resources to help them design and test the kind of space farm that would sustain life by providing oxygen, controlling carbon dioxide levels, and generating food. The project was based on NASA's advanced life support research and featured more than 150 QuickTime movies and images and a wide variety of interactive components.

Pompea reviewed all of the simulations and interface design for the simulations for the alpha and beta test versions of *BioBLAST®* and also contributed curricular materials.

BioBLAST® was the recipient of a 1999 Copper AXIEM (Absolute Excellence in Electronic Media). The sophistication of *BioBLAST*® was also acknowledged and applauded by Children's Software Revue. *BioBLAST*® was selected to be one of five finalists for the CODIE AWARD for School Based Education Product-Best Product of 1999. It also received the Distinguished Achievement Award for Excellence in Educational Publishing—Educational Technology Curricular Software, Association of Educational Publishers, 1999– one of four finalists.



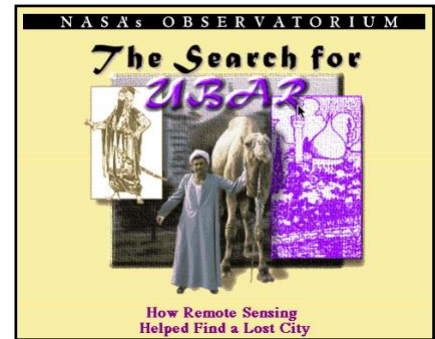
The Observatorium

The *Observatorium* was a project of the Remote Sensing Public Access Center (RSPAC). RSPAC is a cooperative program among the NASA Office of Aeronautics Learning Technologies Project (LTP), TRW Inc., and West Virginia University. RSPAC is located at the NASA Software Independent Verification and Validation Center in Fairmont, West Virginia.



Dr. Pompea served on the site design team and as general consultant to several RSPAC-supported educational projects in earth and space sciences. He created Educational Exhibits in the following areas:

- **Ubar: The Lost City:** How archeologists used satellite imagery to find an ancient city.
- **Learning Without Touching:** An introduction to remote sensing.
- **Remote Sensing in History:** The evolution of remote sensing over the last 2000 years.



Resource units were created to provide background information on basic concepts of remote sensing. Five of the most popular modules are **Resolution, False Color, Radar Imaging, Orbits,** and the **Electromagnetic Spectrum**. A primer on current educational trends was also created for scientists managing educational development projects. The *Observatorium* site won many awards and was named as one of the top 50 science and technology web sites by *Popular Science* magazine.

Mars Gamma Ray Spectrometer Exhibits

Dr. Pompea was involved in the design, production, and installation of an exhibit on spectroscopy for the Tucson Children's Museum as part of the educational efforts of the Mars Gamma Ray Spectrometer group at the Lunar and Planetary Laboratory of the University of Arizona. The exhibit strove to introduce children to all aspects of a space mission as well as to provide an opportunity for families to explore light and color.



Apollo 2000

Dr. Pompea was the principal consultant on the *Apollo 2000* project, sponsored by an SBIR grant in 1996 to Mission Research/Dzignlight Studio in Santa Barbara. In this project, an advanced computer learning and gaming environment was created that allowed the user to interact with characters from different historical periods. Below are scenes where the user is visiting Galileo's villa to assist him in his science experiments.

The project addressed important issues in computer-assisted instruction including advances in user-centered educational design. The environment was designed to be adaptive for different user learning and communication styles. In this e-learning project, the focus was on teaching problem-solving and decision-making processes in an experimental context.



Sonification of Scientific Data

Dr. Pompea worked with John Keller (then a graduate student at UA Lunar and Planetary Lab, now the Director of Fiske Planetarium at the University of Colorado) and computer scientist/musician Marty Quinn (Design Rhythmics Sonification Research Lab, New Hampshire) to explore the use of converting science data to sound to foster public understanding of science data. They converted Mars Gamma Ray Spectrometer data for Mars into an auditory stream that represented changes in weather patterns on Mars. The project showed the potential of using large data sets presented in novel ways and the utility of this approach for auditory learners.

Tucson Children's Museum Optics Exhibits

Dr. Pompea worked to create new exhibits at the Tucson Children's Museum, where he served for several years on the Program and Exhibits Committee. As Education Co-Chair of the Arizona Optics Industry Association, he was part of a collaborative effort to create and install 15 exhibits on optics collectively titled "Now You See It,

Now You Don't," which opened in the spring of 1996. The exhibits engaged young learners in optics phenomena and experimentation.

LodeStar Project of New Mexico

Dr. Pompea consulted for the *LodeStar* project at the Institute for Astrophysics at the New Mexico, assisting with exhibit, site, and program design. The *LodeStar* project was created to build a world-class park and visitor's center devoted to astronomy and the study of the night sky.

The lower portion of Enchanted Skies Park modeled our Solar System and an upper site on top of a mesa (shown) modeled our galaxy. Although the park was never built, the program created a *LodeStar* wing at the New Mexico Museum of Natural History and Science in Albuquerque. This area houses astronomy exhibits and the planetarium.



The *LodeStar* project represents one of the most innovative attempts to blend astronomy research, public engagement, and teacher and student research.

Public School Science Teacher

Air Academy School District, Colo. Springs, Colorado

Designed and taught courses in physics, astronomy, historical geology, physical geology, physical oceanography, and meteorology for grades 9-12. Responsible for creating and teaching gifted and talented science class. Received state-level recognition for innovative science teaching.

Nebraska Summer Honors Program

Was selected from a national pool of teachers to design and deliver intensive (~100 hours of instruction) 2-week residential course in science for 8 summers to 5-12 highly gifted science students from rural central Nebraska. Designed and taught immersive courses in Chemistry/Physics, Observational Astronomy, Remote Sensing Geology, and Rocky Mountain Field Geology.

Outreach Educator at the Madison McDonald Observatory

As a graduate student at Colorado State University (1975-1977), Dr. Pompea led an extensive evening public outreach program at the Madison-McDonald Observatory on the C.S.U. campus. The Observing was open for students and the public year-round, and offered special programs on astrophotography, for example.

Pompea also traveled under the sponsorship of the C.S.U. Physics Department giving astronomy talks to about 20 groups a year throughout the state of Colorado.

Migrant Education Science Program

As a graduate student, Dr. Pompea was selected as the science educator for the Migrant Education Project at Colorado State University that delivered education programs to the children of migrant farm workers. Pompea developed traveling exhibits and demonstrations in 1976 in the areas of astronomy and meteorology. He traveled that summer with these exhibits throughout Colorado to summer schools and farm worker camps. The program audience was Spanish-speaking migrant farm workers working in the sugar beet farming regions on the plains of eastern Colorado and in the peach orchards on the western slope, near Delta and Montrose, Colorado.

Teaching Certification-Texas and Colorado

Took required education courses in addition to my science major to become a certified teacher in Texas and later in Colorado. Completed my student teaching by designing and teaching courses in astronomy at the Rice Summer School. Took the National Teacher's Exam, scoring at the highest level (99th Percentile).

Galileo School Performances

Delivered many dramatic performances over several decades in educational settings as Galileo in to highlight issues in the history of astronomy. Performances were in full costume with props and music. Audiences included university and secondary school classes in Colorado and Arizona.

Afterschool Science Program, Houston

Hired by the parents-teacher association of an inner-city Houston public school in the Fourth Ward to create and deliver an afterschool science program. Created program on "Playground Physics" using borrowed physics demonstration equipment.

Rice University Tutoring Program, Houston Texas

Tutored public school students on a regular basis in basic math skills.

Montessori School, Houston Texas

Worked as a substitute teacher in a Montessori school.

Scott Carpenter Planetarium, School District 11, Colorado Springs, Colorado

As a high school student, worked with Science Department Head and School District Planetarium Director Dr. John Akey on planetarium programs for elementary students, while studying astronomy with Dr. David Ulmer. Dr. Akey later became the President of the National Science Teachers Association.

STEPHEN M. POMPEA PUBLICATIONS (SELECTED)

Books (Authored or Edited)

1. **S. M. Pompea**, *Image Processing Exercises for Astronomy*, West Publishing (1994). 49 pages plus disks.
2. **S. M. Pompea**, Editor, *Great Ideas for Teaching Astronomy*, 2nd edition, West Publishing (1994). 110 pages.
3. **S. M. Pompea**, Editor, *Current Perspectives in Physics and Astronomy*, West Publishing (1995) 295 pages.
4. **S. M. Pompea**, Editor, *Great Ideas for Teaching Astronomy*, 3rd edition, Brooks Cole (1994) 244 pages.
5. **S. M. Pompea**, Teacher's Manual to 2nd edition *In Quest of the Universe* (college astronomy textbook, West Publishing, 1995).
6. P. M. Glassford, R. P. Breault, and **S. M. Pompea**, Editors, *Optical System Contamination V and Stray Light and System Optimization, Proceedings of the SPIE*, Volume 2864, 1996.
7. A. Gould, C. Willard C., and **S. M. Pompea**, *The Real Reasons for Seasons: Sun Earth Connections*, Great Explorations in Math and Science (GEMS) Book, Lawrence Hall of Science, University of California, Berkeley, CA (2000).
8. **S. M. Pompea** and A. Gould, *Invisible Universe: The Electromagnetic Spectrum from Radio Waves to Gamma Rays*, Great Explorations in Math and Science (GEMS) Series, Lawrence Hall of Science, University of California, Berkeley, CA (2003).
9. D. Glaser, K. Beals, **S. M. Pompea**, and C. Willard, *Living with a Star*, Great Explorations in Math and Science (GEMS) Series, Lawrence Hall of Science, University of California, Berkeley, CA (2003).

Hands-On Optics Curriculum Book Series for NSF Hands-On Optics Project with SPIE and OSA (published by NOAO for the project)

1. **S. M. Pompea**, C. E. Walker, C. Peruta, B. Kinder, J. M. Bailey, and R. Sparks, *Laser Challenges*, Hands-on Optics: Making an Impact with Light, Module 1 Book, National Optical Astronomy Observatory Tucson, AZ (2005).

2. **S. M. Pompea**, C. E. Walker, C. Peruta, B. Kinder, J. M. Bailey, and R. Sparks, *Kaleidoscope Adventures*, Hands-on Optics: Making an Impact with Light, Module 2 Book, National Optical Astronomy Observatory Tucson, AZ (2005).
3. **S. M. Pompea**, C. E. Walker, C. Peruta, B. Kinder, J. M. Bailey, and R. Sparks, *Magnificent Magnifications*, Hands-on Optics: Making an Impact with Light, Module 3 Book, National Optical Astronomy Observatory Tucson, AZ (2005).
4. **S. M. Pompea**, C. E. Walker, C. Peruta, B. Kinder, J. M. Bailey, and R. Sparks, *Peculiar Polarizations*, Hands-on Optics: Making an Impact with Light, Module 4 Book, National Optical Astronomy Observatory Tucson, AZ (2005).
5. **S. M. Pompea**, C. E. Walker, J. M. Bailey, and R. Sparks, *Ultraviolet and Infrared Light*, Hands-on Optics: Making an Impact with Light, Module 5 Book, National Optical Astronomy Observatory Tucson, AZ (2005).
6. **S. M. Pompea**, C. E. Walker, J. M. Bailey, and R. Sparks, *Communicating on a Beam of Light*, Hands-on Optics: Making an Impact with Light, Module 6 Book, National Optical Astronomy Observatory Tucson, AZ (2005).

Book Chapters and Contributions to Resource Books

1. **S. M. Pompea**, significant number of contributions in *Great Ideas for Teaching Astronomy*, 1st edition, K. Kuhn, D. Hoff, and L. Winkler, ed., West Publishing Company (1989).
2. **S. M. Pompea**, 33 short contributions in *Great Ideas for Teaching Physics*, West Publishing Company (1991).
3. **S. M. Pompea**, 61 short contributions in *Great Ideas for Teaching Geology*, West Publishing Company (1992).
4. **S. M. Pompea**, "Stray Radiation Issues in Astronomical Systems with Adaptive Optics," *Adaptive Optics for Astronomy*, Kluwer Academic Publishers (1995). [Book Chapter]
5. **S. M. Pompea** and R. P. Breault, "Optical Black Surfaces," in *Handbook of Optics, 2nd edition*, Optical Society of America, 1995. [Invited Chapter]
6. **S. M. Pompea** and S. H. McCall, "Black Surfaces," *Encyclopedia of Modern Optics*, Elsevier, (2004) [Invited Chapter].
7. **S. M. Pompea**, C. E. Walker, and R. T. Sparks, "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, 2008. [Invited Chapter]

8. John Keller and **S. M. Pompea**, Editors, Demonstration Section, *Astronomy Education Review*, Volume 7, Issue 2, 2008.
9. **S. M. Pompea** and R. P. Breault, "Characterization and Use of Black Surfaces for Optical Systems," in *Handbook of Optics, 3rd edition*, Optical Society of America, 2009. [Invited Chapter].
10. **S. M. Pompea** and P. Russo, "Astronomers Engaging with the Education Ecosystem: A Best-Evidence Synthesis," *Annual Review of Astronomy and Astrophysics*, Vol. 58:313-361 August 2020. [Invited Review Chapter]

CD-ROMS (significant authorship)

1. ***Astronomy Village: Investigating the Universe*** CD-ROM, NASA Classroom of the Future (1996).
2. ***Astronomy Village: Investigating the Solar System*** CD-ROM, NASA Classroom of the Future (2000).
3. ***BioBLAST***® (Better Learning Through Adventure, Simulation and Telecommunications) CD-ROM, NASA Classroom of the Future (1999)
4. ***The Arctic Observatory*** CD-ROM, CIESIN and Office of Naval Research) (1996)
5. ***The Real Reasons for Seasons: Sun Earth Connections*** CD-ROM, Great Explorations in Math and Science (GEMS), Lawrence Hall of Science, University of California, Berkeley, CA (2000).
6. ***Living with a Star*** CD-ROM, Great Explorations in Math and Science (GEMS) Series, Lawrence Hall of Science, University of California, Berkeley, CA (2003).

Internally Published Reports

1. **S. M. Pompea**, "Earth Observations from a Space Station," Space Station Needs, Attributes, and Architectural Options Study. Final Report Contract NASW-3686 Martin Marietta Aerospace Corporation (1983). (Released Technical Report)
2. **S. M. Pompea**, F. Bartko, and M. Hall, "Stepper Motor Alignment Repeatability at Cryogenic Temperatures," Final Report, NASA Ames Research Center Contract A88926B, Martin Marietta Aerospace Corporation (1982). (Released Technical Report)
3. **S. M. Pompea**, "Inflatable Antennas in Orbit: The Effects of the Space Environment," Technical Publication MT-2, Martin Marietta Aerospace Corporation (1981). (Released Technical Report)

BOOKS, JOURNAL, AND PUBLISHED CONFERENCE PROCEEDINGS (CHRONOLOGICAL)

>150 entries

Published abstracts of conference presentations are not included. See next section for conference presentations.

1. P. G. K. Kahn and **S. M. Pompea**, "Nautiloid Growth Rhythms and Dynamical Evolution of the Earth-Moon System," *Nature* **275** (1978) pp. 606-611 [Article].
2. P. G. K. Kahn, **S. M. Pompea**, and R. B. Culver, "Paleoastronomy," *The Astronomy Quarterly* **2**, No. 5 (1978) 3.
3. **S. M. Pompea**, P. G. K. Kahn, and R. B. Culver, "Paleoastronomy and Nautiloid Growth: A Perspective," *Vistas in Astronomy* **23** (1979) 185. [Invited Review Article]
4. **S. M. Pompea**, F. Bartko, and J. R. Houck, "Cryogenic Testing of Stepper Motors," *Proceedings of the SPIE: Instrumentation in Astronomy IV.*, **331** (1982) 36.
5. **S. M. Pompea**, M. S. Hall, F. Bartko, and J. R. Houck, "Positional Repeatability Measurements of Stepper Motors at Cryogenic Temperatures," *Proceedings of the SPIE: Technologies of Cryogenically Cooled Sensors and Fourier Transform Spectrometers II.*, **364** (1982) 164.
6. **S. M. Pompea**, D. W. Bergener, D. F. Shepard, S. L. Russak, and W. L. Wolfe, "Preliminary Performance Data on an Improved Optical Black for Infrared Use," *Proceedings of the SPIE: New Optical Materials*, **400** (1983) 128. [Also reprinted in *Selected Papers on Cryogenic Optical Systems*, Gerald R. Pruitt, Editor, SPIE Milestone Series, 1994.]
7. **S. M. Pompea**, D. W. Bergener, and D. F. Shepard, "Martin Infrablack: Reflectance Characteristics of an Infrared Absorbing Surface," *Proceedings of the 31st National Infrared Information Symposium* (1983) 487.
8. D. W. Bergener, **S. M. Pompea**, D. F. Shepard, and R. P. Breault, "Stray Light Rejection Performance of SIRTF: A Comparison," *Proceedings of the SPIE: Stray Radiation IV.*, **511** (1984) 64. [Also reprinted in *Selected Papers on Cryogenic Optical Systems*, Gerald R. Pruitt, Editor, SPIE Milestone Series, 1994.]

9. **S. M. Pompea**, D. W. Bergener, D. F. Shepard, and K. S. Williams, "The Effects of Atomic Oxygen on Martin Black and Infrablack," *Proceedings of the SPIE: Stray Radiation IV.*, 511 (1984) 24.
10. **S. M. Pompea**, D. W. Bergener, D. F. Shepard, S. L. Russak, and W. L. Wolfe, "Reflectance Measurements on an Improved Optical Black for Stray Light Rejection from 0.3 to 500 Microns," *Optical Engineering*, **23**(2) (1984) 149. [Also reprinted in *Selected Papers on Cryogenic Optical Systems*, Gerald R. Pruitt, Editor, SPIE Milestone Series, 1994.]
11. D. F. Shepard, **S. M. Pompea**, and S. Anderson, "The Effect of Elevated Temperatures on the Scattering Characteristics of an Optical Black Surface at 0.6328 and 10.6 Micrometers," *Proceedings of the SPIE: Stray Light and Contamination in Optical Systems*, **967** (1989) 286.
12. S. Anderson, **S. M. Pompea**, D. F. Shepard, and R. Castonguay, "Performance of a Fully Automated Scatterometer for BRDF and BTDF Measurements at Visible and Infrared Wavelengths," *Proceedings of the SPIE: Stray Light and Contamination in Optical Systems*, **967** (1989) 159.
13. **S. M. Pompea**, significant contributions in *Great Ideas for Teaching Astronomy*, K. Kuhn, D. Hoff, and L. Winkler, ed., West Publishing Company (1989).
14. **S. M. Pompea**, D. F. Shepard, and S. Anderson, "BRDF Measurements at 6328 Angstroms and 10.6 Micrometers of Optical Black Surfaces for Space Telescopes," *Proceedings of the SPIE: Stray Light and Contamination in Optical Systems*, **967**, (1989) 236.

Reprinted in *Selected Papers on Cryogenic Optical Systems*, Gerald R. Pruitt, Editor, SPIE Milestone Series (1994).
15. **S. M. Pompea**, "The Relationship of Galaxy Morphology to Nuclear Star Formation in Non-Interacting Spiral Galaxies," Ph.D. Dissertation, University of Arizona (1989).
16. **S. M. Pompea** and G. H. Rieke, "Inhibition of Star Formation in Sa Galaxies," *Ap. J.*, **342**, (1989) 250.
17. **S. M. Pompea** and G. H. Rieke, "A Search for Bars at 2 Microns in High Luminosity Infrared Galaxies," *Ap. J.* **356**, (1990) 416.
18. **S. M. Pompea**, 33 short contributions in *Great Ideas for Teaching Physics*, West Publishing Company (1991).
19. **S. M. Pompea**, 61 short contributions in *Great Ideas for Teaching Geology*, West Publishing Company (1992).

20. **S. M. Pompea**, and S. H. C. P. McCall, "Outline of Selection Processes for Black Baffle Surfaces in Optical Systems," *Proceedings of the SPIE: Stray Light IV*, 1753 (1993)
21. S. H. C. P. McCall, **S. M. Pompea**, R. P. Breault, and N. L. Regens, "Reviews of Black Surfaces," *Proceedings of the SPIE: Stray Light IV*, 1753 (1993).

Reprinted in *Selected Papers on Cryogenic Optical Systems*, Gerald R. Pruitt, Editor, SPIE Milestone Series (1994).
22. **S. M. Pompea**, J. E. Mentzell, and W. E. Siegmund, "A Stray Light Analysis of the Sloan Digital Sky Survey Telescope," *Proceedings of the SPIE: Stray Light IV*, **1753** (1993).
23. S. McCall, R. L. Sinclair, **S. M. Pompea**, and R. P. Breault, "Spectrally Selective Surfaces for Ground and Space-Based Instrumentation: Support for a Resource Base," *Proceedings of the SPIE: Space Astronomical Telescopes and Instruments II*, **1945** (1993).
24. **S. M. Pompea**, *Image Processing Exercises for Astronomy*, West Publishing (1994). [Book]
25. **S. M. Pompea**, Editor, *Great Ideas for Teaching Astronomy*, 2nd edition, West Publishing (1994). [Book]
26. **S. M. Pompea**, "Common Black Baffle Surfaces for Telescopes and Cryogenic Infrared Instruments" *Proceedings of the SPIE: Stray Radiation in Optical Systems III*, **2260** (1994), 29.
27. B. Ellerbroek, **S. M. Pompea**, D. Robertson, C. Mountain, "Adaptive Optics Performance Analysis for the Gemini 8-M Telescopes Project," *Proceeding of the SPIE: Adaptive Optics in Astronomy*, **2201** (1994), 421.
28. D. Johnston, B. Ellerbroek, **S. M. Pompea**, "Curvature Sensing Analysis," *Proceeding of the SPIE: Adaptive Optics in Astronomy*, **2201** (1994), 528.
29. **S. M. Pompea**, "Stray Radiation Issues in Astronomical Systems with Adaptive Optics," *Adaptive Optics for Astronomy*, Kluwer Academic Publishers (1995). [Book Chapter]
30. **S. M. Pompea** and R. P. Breault, "Optical Black Surfaces," in *Handbook of Optics*, 2nd edition, Optical Society of America, 1995. [Invited book chapter]
31. **S. M. Pompea** and C. Blurton, "A Walk Through the Astronomy Village," *Mercury*, (1995) Jan.-Feb. issue.
32. **S. M. Pompea**, Editor, *Current Perspectives in Physics and Astronomy*, West Publishing [Book] (1995).

33. **S. M. Pompea**, "The Management of Stray Radiation Issues in Space Optical Systems," *Space Science Reviews*, **74** (1995) 181-193.
34. **S. M. Pompea** and M. J. Nofziger, "Resources on Optics in Middle School Education," *Proceedings SPIE: 1995 International Conference on Education in Optics*, Edited by M. J. Soileau, **2525**, (1995).
35. **S. M. Pompea** and L. Stepp, "Great Ideas for Teaching Optics," *Proceedings SPIE: 1995 International Conference on Education in Optics*, Edited by M. J. Soileau, **2525** (1995).
36. **S. M. Pompea**, "Arizona Optics Industry Association (AOIA) Focus Group Activities on Education," *Proceedings of the SPIE, Global Networking of Regional Optics Clusters*, Edited by R. P. Breault, **1550** (1996.)
37. **S. M. Pompea**, "The Astronomy Village," *Astronomy Education: Current Developments, Future Coordination*, Edited by John R. Percy, Astronomical Society of the Pacific Conference Series, **89**, (1996), 259-261.
38. **S. M. Pompea**, "Advances in the Stray Light Analysis of Astronomical Telescope Systems," *Proceedings of the SPIE: Optical Telescopes of Today and Tomorrow: Following in the Direction of Tycho Brahe*, A. Arneberg, Editor, **2871** (1997) 193-195.
39. **S. M. Pompea**, "Calibration Screen Issues for High Performance Astronomical Telescope Systems," *Proceedings of the SPIE: Optical Telescopes of Today and Tomorrow: Following in the Direction of Tycho Brahe*, A. Arneberg, Editor, **2871** (1997) 1231-1234.
40. **S. M. Pompea** and C. Blurton, "The Astronomy Village: Investigating the Universe," *New Trends in Astronomy Teaching*, edited by L. Gouguenheim, D. McNally, and J. R. Percy, Cambridge University Press, (1998).
41. C. Drouet d'Aubigny, C. Walker, C. Groppi, J. Hill, J. Beiging, and **S. M. Pompea**, "A Submillimeter-Wave Receiver System for the Large Binocular Telescope," *Proceedings of the SPIE, Astronomy 2000*, (2000).
42. Gould, A, Willard, C., and **S. M. Pompea**, *The Real Reasons for Seasons: Sun Earth Connections*, Great Explorations in Math and Science (GEMS) [Book and CD-ROM], Lawrence Hall of Science, Berkeley, CA (2000).
43. **S. M. Pompea** and I. Hawkins, "Increasing Science Literacy in Optics and Photonics through Science Centers, Museums, and Web-based Exhibits," *Proceedings of the SPIE: Education and Training in Optics and Photonics*, **4588**, 2002.

44. M. Hall-Wallace, N. L. Regens, and **S. M. Pompea**, "Design of a Professional Development and Support Program for Future Photonics Industry Team Leaders," *Proceedings of the SPIE: Education and Training in Optics and Photonics*, **4588** (2002).
45. **S. M. Pompea** and T. K. Gek, "Optics in the Great Exploration in Math and Science (GEMS) Program: A Summary of Effective Pedagogical Approaches," *Proceedings of the SPIE: Education and Training in Optics and Photonics*, **4588** (2002). (Invited Paper)
46. M. Hall-Wallace, N. L. Regens, **S. M. Pompea**, "University of Arizona's Collaboration to Advance Teaching Technology and Science (CATTS): Lesson for Photonics Education Collaborations," *Proceedings of the SPIE: Education and Training in Optics and Photonics*, **4588** (2002).
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154. L. Rodrigues, **S. M. Pompea**, A. Meneses, and M. Montenegro, "A Characterization of Astronomy Teacher Professional Development Programs in Chile," *Journal of Science Teacher Education*, in press (2024).

CONFERENCE TALKS AND CONFERENCE POSTERS, SELECTED MAJOR WORKSHOPS (CHRONOLOGICAL)

(Selected Presentations). Talks are contributed unless noted as invited.
>420 entries

1. **S. M. Pompea**, F. Bartko, and J. R. Houck, "Cryogenic Testing of Stepper Motors," SPIE Conference on Instrumentation in Astronomy IV, Tucson, Arizona, March 8, 1982.
2. **S. M. Pompea**, M. S. Hall, F. Bartko, and J. R. Houck, "Positional Repeatability Measurements of Stepper Motors at Cryogenic Temperatures," SPIE Conference on Technologies of Cryogenically Cooled Sensors and Fourier Transform Spectrometers II, San Diego, California, August 27, 1982.
3. S. L. Russak, **S. M. Pompea**, D. W. Bergener, D. F. Shepard, and W. L. Wolfe, "Preliminary Performance Data on an Improved Optical Black for Infrared Use," SPIE Conference on New Optical Materials, Geneva, Switzerland, April 20, 1983.
4. D. W. Bergener, **S. M. Pompea**, D. F. Shepard, and R. P. Breault, "Stray Light Rejection Performance of SIRTf: A Comparison," SPIE Conference on Stray Radiation IV, San Diego, California, April 23, 1984.
5. **S. M. Pompea**, D. W. Bergener, D. F. Shepard, and K. S. Williams, "The Effects of Atomic Oxygen on Martin Black and Infrablack," SPIE Conference on Stray Radiation IV, San Diego, California, April 23, 1984.
6. S. Anderson, **S. M. Pompea**, D. F. Shepard and R. Castonguay, "Performance of a Fully Automated Scatterometer for BRDF and BTDF Measurements at Visible and Infrared Wavelengths," SPIE Conference on Stray Light and Contamination in Optical Systems, San Diego, California, August 18, 1988.
7. D. F. Shepard, **S. M. Pompea**, and S. Anderson, "The Effect of Elevated Temperatures on the Scattering Characteristics of an Optical Black Surface at 0.6328 and 10.6 Micrometers," SPIE Conference on Stray Light and Contamination in Optical Systems, San Diego, California, August 19, 1988.
8. **S. M. Pompea**, D. F. Shepard, and S. Anderson, "BRDF Measurements at 6328 Angstroms and 10.6 Micrometers of Optical Black Surfaces for Space Telescopes," SPIE Conference on Stray Light and Contamination in Optical Systems, San Diego, California, August 19, 1988.
9. **S. M. Pompea** and S. H. C. P. McCall, "Outline of Selection Processes for Black Baffle Surfaces in Optical Systems," SPIE Conference on Stray Light IV, San Diego, California, July 21, 1992.

10. S. H. C. P. McCall, **S. M. Pompea**, R. P. Breault, and N. L. Regens, "Reviews of Black Surfaces," SPIE Conference on Stray Light IV, San Diego, California, July 22, 1992.
11. **S. M. Pompea**, J. E. Mentzell, and W. E. Siegmund, "A Stray Light Analysis of the Sloan Digital Sky Survey Telescope," SPIE Conference on Stray Light IV, San Diego, California, July 22, 1992.
12. S. H. C. P. McCall, R. L. Sinclair, **S. M. Pompea**, and R. P. Breault, "Spectrally Selective Surfaces for Ground and Space-Based Instrumentation: Support for a Resource Base," SPIE Conference on Space Astronomical Telescopes and Instruments II, Orlando, Florida, April 14, 1993.
13. **S. M. Pompea**, "Common Black Baffle Surfaces for Telescopes and Cryogenic Infrared Instruments" SPIE Conference on Stray Radiation in Optical Systems III, San Diego, California, July 24, 1994.
14. B. Ellerbroek, **S. M. Pompea**, D. Robertson, C. Mountain, "Adaptive Optics Performance Analysis for the Gemini 8-M Telescopes Project" SPIE Conference on Adaptive Optics in Astronomy, Kona, Hawaii, March 17, 1994.
15. D. Johnston, B. Ellerbroek, **S. M. Pompea**, "Curvature Sensing Analysis," SPIE Conference on Adaptive Optics in Astronomy, Kona, Hawaii, March 17, 1994
16. **S. M. Pompea**, "Stray Radiation Issues in Astronomical Systems with Adaptive Optics," NATO Advanced Study Institute on Adaptive Optics for Astronomy, Cargese, Corsica July, 1993.
17. **S. M. Pompea** and W. G. Weller, "Stellar Images and Diffraction," American Astronomical Society, Washington D.C., January 1994.
18. **S. M. Pompea**, "The Management of Stray Radiation Issues in Space Optical Systems," Future Infrared and Submillimetre Space Missions Workshop, Saclay, France, July, 1994.
19. **S. M. Pompea**, "The Astronomy Village: Ten Investigations in Astronomy," Astronomical Society of the Pacific, Black Holes to Blackboards: An Astronomy Education Workshop, Tucson, Arizona, January 9, 1995.
20. **S. M. Pompea**, "Spectrally Selective Surfaces for Optical Systems": SPIE, The International Society for Optical Engineering Short Course for Optics Professionals, April 20, 1994.
21. C. Blurton and **S. M. Pompea**, "Engaging Students in the Study of Astronomy through Multimedia Software," presented at the 26th Annual Meeting of the Canadian Astronomical Society, Penticton, British Columbia, Canada, May 28, 1995.

22. **S. M. Pompea**, "Optics Education: Coming to a School Near You," Optical Society of America national meeting, Tucson, Arizona, June 7, 1995. (Invited Talk)
23. **S. M. Pompea**, "The Astronomy Village," Astronomical Society of the Pacific Education Symposium, University of Maryland, June, 1995. (Poster)
24. **S. M. Pompea** and six others, "Exploring the Solar System in the Classroom: A Hands-On Approach," Geological Society of America, New Orleans, November 4, 1995. (National Teacher Workshop)
25. **S. M. Pompea**, J. Baro, and C. Blurton, "A Visit to the Astronomy Village: Thematic Investigations on the Computer," Session on Astronomy as a Thematic Approach to Physics, American Association of Physics Teachers, Reno, Nevada, January 16, 1996.
26. **S. M. Pompea**, "Technology in Practice: The Astronomy Village," Astronomy Teaching Workshop Sponsored by the Space Science Institute, Boulder, Colorado, February 18-21, 1996.
27. **S. M. Pompea** and S. McGee, "Investigating the Universe with NASA's New Multimedia Program-The Astronomy Village." Seventh International Conference of the Society for Information Technology and Teacher Education (SITE), Phoenix, Arizona, March 16, 1996.
28. **S. M. Pompea**, "An Introduction to the Astronomy Village," Astronomical Society of the Pacific Workshop on Teaching Astronomy, Santa Clara, California, June 24-25, 1996.
29. **S. M. Pompea**, "The Astronomy Village," International Astronomical Union Colloquium 162: New Trends in Astronomy Teaching, University College, London and The Open University, July 8, 1996. (Talk and Poster)
30. **S. M. Pompea**, "Experiences in Internet-based Science Education," National Science Teachers Association Global Summit, San Francisco, California, December 28, 1996. (Invited Panel)
31. **S. M. Pompea**, "Astronomy Village-A Virtual Observatory," Astronomy and Cosmology Symposium, National Science Teachers Association Global Summit, San Francisco, California, December 29, 1996.
32. **S. M. Pompea**, "Using the Astronomy Village," One-day workshop, American Association of Physics Teachers, Phoenix, Arizona, January 4, 1997. (National Workshop)
33. **S. M. Pompea**, "Research Team Decision Making in the Astronomy Village: Investigating the Universe Program," American Association of Physics Teachers, Phoenix, Arizona, January 7, 1997.

34. C. E. Walker, **S. M. Pompea**, and five others, "Astronomy Course Improvement for Faculty and Pre-service Science Teachers" American Association of Physics Teachers, Phoenix, Arizona, January 7, 1997. (National Workshop)
35. **S. M. Pompea**, "Using the Observatorium as a Tool for Public Outreach," American Association of Physics Teachers, Phoenix, Arizona, January 9, 1997.
36. **S. M. Pompea**, "An Overview of the Astronomy Village," Seventh Annual Science and Mathematics Conference, Tucson, Arizona, February 8, 1997.
37. **S. M. Pompea**, "Exploring the Environment" Seventh Annual Science and Mathematics Conference, Tucson, Arizona, February 8, 1997.
38. **S. M. Pompea**, "The Astronomy Village," Third Annual Pre-College Workshop for Scientists and Engineers, sponsored by the Space Science Institute, Boulder Colorado, February 23-26, 1997. (Poster)
39. **S. M. Pompea**, "Technology in Education," Third Annual Pre-College Workshop for Scientists and Engineers, sponsored by the Space Science Institute, Boulder Colorado, February 23-26, 1997. (Invited)
40. R. J. Myers, J. A. Botti, and **S. M. Pompea**, "Design, Development, and Implementation of an Inquiry-Based, Technology-Rich, Science Curriculum," refereed conference paper, American Education Research Association, Chicago, Illinois, March 24-28, 1997.
41. **S. M. Pompea**, "The Astronomy Village--An Astronomy Research Experience for Undergraduates," Astrophysical, Planetary, and Atmospheric Sciences Department Colloquium, University of Colorado, Boulder, April 7, 1997.
42. **S. M. Pompea**, "The Astronomy Village Software," Astronomical Society of the Pacific's Universe in the Classroom Teacher Workshop, Chicago Illinois, June 27, 28, 1997. (Talk and Workshop)
43. **S. M. Pompea**, "Using the Astronomy Village" Workshops for Earth and Space Science Technical Education Project, sponsored by Geological Society of America, Space Science Institute, and Cypress Community College. Boulder, Colorado, July 12 and August 9, 1997. (National Workshop)
44. **S. M. Pompea**, "The Astronomy Village," One-day Workshop at the American Association of Physics Teachers meeting, Denver, Colorado, August 12, 1997. (National Workshop)
45. **S. M. Pompea**, "The Astronomy Village Multimedia Program," two talks at the California Science Teachers Convention, Palm Springs, California, October 3-5, 1997.

46. **S. M. Pompea**, "Astronomy Village: Investigating the Solar System: A New Tool for Outreach," American Association of Physics Teachers, New Orleans, January 6, 1998.
47. **S. M. Pompea**, "Using the Astronomy Village," One-day Workshop at the American Association of Physics Teachers Meeting, New Orleans, LA, January 3, 1998. (National Workshop)
48. **S. M. Pompea**, "Enchanted Skies Park: Program and Exhibits for Teaching about Clear Dark Skies," Symposium on Light Pollution, Athens, Greece, May 23-24, 1998. (Invited)
49. **S. M. Pompea**, "Radio Wave Pollution and its Effect on Radio Astronomy," Symposium on Light Pollution, Athens, Greece, May 23-24, 1998. (Invited)
50. **S. M. Pompea**, "Light Pollution through Slides," Symposium on Light Pollution, Athens, Greece, May 23-24, 1998. (Invited)
51. **S. M. Pompea**, "Activities from the Astronomy Village," Astronomical Society of the Pacific Teacher's Workshop, ASP Annual Meeting, Albuquerque, New Mexico, June 26, 1998.
52. **S. M. Pompea**, "Effective Audio-visual and Laboratory Materials," International Symposium on Teaching Astronomy to Non-Science Majors, sponsored by the Astronomical Society of the Pacific, Albuquerque, New Mexico, June 30, 1998. (Panel, Chair)
53. **S. M. Pompea** and S. Croft, "Using Digital Cameras to Teach about Infrared Radiation and Instrumentation Technology" American Astronomical Society, Austin, Texas, January 8, 1999.
54. **S. M. Pompea**, "Using the Astronomy Village," one-day Workshop, American Association of Physics Teachers, Anaheim, California, January 10, 1999. (National Workshop)
55. **S. M. Pompea**, W. Barta, and C. Morrow, "Multimedia Instructional Materials for Public Outreach: A Developer's Perspective," American Association of Physics Teachers, Anaheim California, January 12, 1999.
56. **S. M. Pompea**, "New Directions in the Development of Activities Using Image Processing," American Association of Physics Teachers, Anaheim CA, January 14, 1999. (Invited)
57. **S. M. Pompea**, "Using NIH Image as a Tool for Image Processing," American Association of Physics Teachers, Anaheim CA, January, 1999. (Invited)

58. **S. M. Pompea**, S. Croft and S. McGee, "Astronomy Village: Investigating the Solar System—Scientific Investigation in a Rich, Standards-Based Environment," American Geophysical Union Meeting, San Francisco, December 17, 1999.
59. A. Gould, C. Willard, and **S. Pompea**, "Seasons—A Sun Earth Connection: A GEMS Guide," American Geophysical Union Meeting, San Francisco, December 17, 1999. (Workshop presenter)
60. **S. M. Pompea**, "Using the Astronomy Village," One-day Workshop, American Association of Physics Teachers, Kissimmee, Florida, January 15, 2000. (National Workshop)
61. **S. M. Pompea**, S. Croft, and J. Hornyak, "Teaching about Scientific Investigation: The Astronomy Village: Investigating the Solar System Program," American Association of Physics Teachers, Kissimmee, Florida, January 19, 2000.
62. **S. M. Pompea**, S. Croft and S. McGee, "Plates on Pluto? Research-Based Student Activities," American Geophysical Union, Washington D.C., May 30, 2000.
63. S. Croft and **S. M. Pompea**, "Astronomy Village: Investigating the Solar System—A Rich Collaborative Problem-Solving Environment Utilizing Web-Based Technology," American Geophysical Union, San Francisco, December 15, 2000. (Invited)
64. **S. M. Pompea** and S. Croft, "Adapting Formal Resource-Rich Multimedia Science Programs for Use in Informal Science Settings," American Geophysical Union, San Francisco, December 15, 2000. (Poster)
65. E. Alvarez del Castillo and **S. M. Pompea**, "Inquiry Oriented Light Pollution Activities for Astronomy Outreach Programs," Joint meeting of American Astronomical Society and American Association of Physics Teachers, San Diego, January 9, 2001.
66. **S. M. Pompea**, S. Croft, and S. McGee, "Searching for Life Using Multispectral Imagery: Computer-Based Activities," Joint meeting of American Astronomical Society and American Association of Physics Teachers, San Diego, January 10, 2001.
67. **S. M. Pompea**, "Directed Inquiry and Problem-Solving Using Science Data: Some Educational Success Stories," Science Data Center Symposium 2001, Pasadena, California, March 27, 2001.
68. **S.M. Pompea**, S. Croft, and S. McGee, "Craters, Craters, Everywhere, or Lots of Spots to Think," American Geophysical Union, Boston, Massachusetts, May 29-30, 2001. (Poster)

69. **S. M. Pompea**, "The Scientist and the Educational Development Team: An Impedance Mismatch?" American Geophysical Union, Boston, Massachusetts, May 31, 2001.
70. **S. M. Pompea** and I. Hawkins, "Increasing Science Literacy in Optics and Photonics through Science Centers, Museums, and Web-based Exhibits," Opto-Southwest Conference of the Society of Photo-Optical Instrumentation Engineers, Tucson, September 18, 2001.
71. **S. M. Pompea** and A. Gould, "Teaching about the Electromagnetic Spectrum Using the Herschel Experiment," Opto-Southwest Conference of the Society of Photo-Optical Instrumentation Engineers, Tucson, September 18, 2001.
72. **S. M. Pompea** and T. K. Gek, "Optics in the Great Exploration in Math and Science (GEMS) Program: A Summary of Effective Pedagogical Approaches," Seventh International Topical Meeting on Education & Training in Optics & Photonics, Singapore, November 26-30, 2001. (Invited)
73. **S. M. Pompea**, "Design of Computer-Assisted Education Programs for Optics and Photonics: Implications of Educational Technology Research," Seventh International Topical Meeting on Education & Training in Optics & Photonics, Singapore, November 26-30, 2001.
74. M. Hall-Wallace, N. L. Regens, and **S. M. Pompea**, "Design of a Professional Development and Support Program for Future Photonics Industry Team Leaders," Seventh International Topical Meeting on Education & Training in Optics & Photonics, Singapore, November 26-30, 2001.
75. **S. M. Pompea**, Spectroscopy Workshop, sponsored by the NASA Sun-Earth Education Forum and Coronado Instruments, Tucson, October 5, 2001. (National Workshop)
76. **S. M. Pompea**, S. K. Croft and J. Finstein, Gravity, "Light, Motion, and Scale in Astronomy Village: Investigating the Universe" American Association of Physics Teachers, Philadelphia, January 19-23, 2002.
77. C. E. Walker and **S. M. Pompea**, "Project ASTRO-Tucson: The Art of Learning about the Cosmos around Us," Space Science Institute Workshop, Boulder, April 21-24, 2002. (Poster)
78. **S. M. Pompea**, "Technology in Education," Eighth Annual Pre-College Workshop for Scientists and Engineers, sponsored by the Space Science Institute, Boulder Colorado, April 21-24, 2002/ (Invited Talk)
79. C. Walker, J. Keller, and **S. M. Pompea**, Spectroscopy Workshops at the Inquiry Institute, Tucson May 29, 2002. (Workshop)

80. H. Enos, W. V. Boynton, **S. M. Pompea**, "A Gamma Ray Spectrometer Exhibit in a Children's Museum Setting," NASA Office of Space Science Education and Public Outreach Conference 2002, June 12-14, 2002, Chicago, Illinois. (Poster)
81. C. E. Walker and **S. M. Pompea**, "A Successful Formula for Teacher Retention and Renewal: The Teacher Leaders in Research-Based Science Education Program," NASA Office of Space Science Education and Public Outreach Conference 2002, June 12-14, 2002, Chicago, Illinois. (Poster)
82. C. Barban, C. E. Walker C., **S. M. Pompea**, "Project ASTRO-TUCSON: The Art of Learning about the Cosmos around Us," SF2A-2002: Semaine de l'Astrophysique Française, meeting held in Paris, France, June 24-29, 2002.
83. **S.M. Pompea**, and D. Isbell, "Lessons Learned from Data-Rich Science Education Projects," National Virtual Observatory Education Outreach Meeting, Baltimore, July 12, 2002.
84. **S. M. Pompea**, R. Pfisterer, and J. Morgan, "A Stray Light Analysis of the Apache Point Observatory 3.5-Meter Telescope System," *SPIE Conference on Astronomical Telescopes and Instrumentation into the New Millennium*, August 26, 2002.
85. **S. M. Pompea** and C. E. Walker, "Awesome Experiments in Light and Color: Our Favorite Inquiry – Oriented Activities". Two workshops sponsored by the Optical Society of America at the Orlando Science Center, September 28, 2002. (Workshops)
86. D. McCarthy, L. Lebofsky, T. Slater, M. Rieke, **S. M. Pompea**, NIRCam/JWST Education and Public Outreach: "Linking Girls with the Sky," Division of Planetary Sciences meeting, Birmingham, Alabama, October, 2002. (Poster)
87. **S. M. Pompea**, C. E. Walker, D. Isbell, "Looking South: New Approaches to Space Science Education Utilizing the Tucson-Chile Astronomy Connection," COSPAR, Houston Texas, October 16, 2002.
88. **S. M. Pompea**, C. E. Walker, S. K. Croft, and D. W. McCarthy, "Solar Data in the Classroom: the TLRBSE Experience" American Geophysical Union, San Francisco, December 6-10, 2002. (Poster)
89. S. K. Croft, C. E. Walker, and **S. M. Pompea** "Workshop Formats and Teacher Transformation: the TLRBSE Experience" American Geophysical Union, San Francisco, December 6-10, 2002.
90. J.R. Mould and **S. M. Pompea**, "Education and Outreach Opportunities in New Astronomical Facilities" American Geophysical Union, San Francisco, December 6-10, 2002 (Invited Talk).

91. C. E. Walker and **S. M. Pompea** (NOAO), "Project ASTRO: An Educational Outreach Program for All Seasons," American Geophysical Union, San Francisco, December 6-10, 2002. (Poster)
92. T. Slater, **S. M. Pompea**, K. Garmany, E. Prather, J. Adams, "Teaching Astronomy for the First Time: A Teaching Excellence Workshop for New Faculty, Graduate Students and Post-Docs" American Astronomical Society Meeting, Seattle Washington, January 5, 2003.
93. **S. M. Pompea** (and 26 others) "The ESSENCE /w Project: Strategies and Initial Observations" American Astronomical Society Meeting, Seattle Washington, January 5-9, 2003. (Poster)
94. **S. M. Pompea** (and 25 others) "ESSENCE: Constraining Properties of the Dark Energy with Supernovae" American Astronomical Society Meeting, Seattle Washington, January 5-9, 2003. (Poster)
95. J. M. Keller, W.V. Boynton, H. L. Enos, D. Hamara, D. Janes, K. Kerry, **S. M. Pompea**, E. E. Prather, M. Quinn, and T. F. Slater, 2003, "Educational Use and Effectiveness of an Auditory Display of Mars GRS Data," 34th Annual Lunar and Planetary Science Conference, March 17-23, Houston, Texas. (Poster)
96. T. Rector, **S. M. Pompea**, J. Lockwood, S. K. Croft, C. E. Walker, "Nature's Most Powerful 'Monsters': Teaching Quasar Astronomy in Middle and High School," Workshop at the National Science Teachers Association Annual Meeting, Philadelphia, March 27, 2003.
97. J. Lockwood, S. K. Croft, **S. M. Pompea**, and C.E. Walker, "Blazing Sunspots: Teaching Solar Astronomy in Middle and High School," Workshop at the National Science Teachers Association Annual Meeting, Philadelphia, March 28, 2003.
98. S. K. Croft, T. Rector, C. E. Walker, and **S. M. Pompea**, "Explosive Stars: Teaching Stellar Astronomy in Middle and High School," Workshop at the National Science Teachers Association Annual Meeting, Philadelphia, March 28, 2003.
99. C. E. Walker, A. Gould, and **S. M. Pompea**, "Awesome Experiments in Light and Color," Two Workshops at the National Science Teachers Association Annual Meeting, Philadelphia, March 29, 2003.
100. **S. M. Pompea**, "Invisible Universe GEMS Guide," Workshop for teachers at the Thirteenth Annual Science and Math Conference, sponsored by the University of Arizona Science and Math Education Center, Tucson, April 5, 2003. (Workshop)
101. **S. M. Pompea**, "Patterns in Nature," Keynote address at the Thirteenth Annual Science and Math Conference, sponsored by the University of Arizona Science and Math Education Center, Tucson, April 5, 2003. (Invited)

102. **S. M. Pompea**, J. Harold, and J. Keller, "Educational Uses of Technology," Space Science Institute 8th Annual Education Workshop for Scientists, Engineers, and EPO Managers, May 4 - 7, 2003. (Invited)
103. **S. M. Pompea**, "Astronomy Education Software: The Good, Bad, and the Ugly" Project ASTRO Site Leaders Meeting, Raritan Valley Community College, New Jersey, May 17, 2003. (Invited)
104. T. Slater, **S. M. Pompea**, and K. Garmany, "Learner-Centered Introductory Astronomy Teaching," NSF Chautauqua Short Course for College Teachers, at Columbia University BioSphere2 Center, Oracle, Arizona May 18-20, 2003. (National Workshop)
105. **S. M. Pompea**, D. Isbell, C. E. Walker, and S. Croft, "Serving Multiple Audiences: Approaches to Education and Outreach at NOAO," American Astronomical Society Meeting, Nashville, May 26, 2003.
106. J. M. Keller, M. Quinn, E. Prather, W. V. Boynton, H. L. Enos, L. V. Jones, **S. M. Pompea**, and T. F. Slater, "Educational Testing Of An Auditory Display Regarding Seasonal Variation Of Martian Polar Ice Caps," Proceedings of the 2003 International Conference on Auditory Display, Boston, MA, USA, 6-9 July 2003.
107. T. Slater, **S. M. Pompea**, and E. Prather, "Teaching Astronomy Under Hawai'ian Skies," NSF Chautauqua Short Course for College Teachers, at Institute for Astronomy, University of Hawai'i, Manoa, Honolulu, July 14-16, 2003. (National Workshop)
108. C. E. Walker, M. G. Smith, D. J. Norman, **S. M. Pompea**, D. Orellana, E. M. Alvarez del Castillo and D. Isbell, "Integration of Dark Sky Efforts with Observatory EPO Programs," International Astronomical Meeting, IAU Working Group Meeting, Controlling Light Pollution, Sydney, Australia, July 22, 2003. (Poster)
109. C. E. Walker, M. G. Smith, D. J. Norman, **S. M. Pompea**, D. Orellana, E. M. Alvarez del Castillo, R. Leiton and D. Isbell, "International Dark-Sky Education at NOAO: Collaborative Approaches" International Astronomical Meeting, IAU Working Group Meeting, Controlling Light Pollution, Sydney, Australia, July 22, 2003.
110. J. Antonellis, D. Colodner, L. Falk, M. Liddelov, and **S. M. Pompea**, "Electronic Detectives of the Future and Past," American Association of Physics Teachers National Meeting, Madison, Wisconsin, August 2-6, 2003.
111. S. K. Croft, **S. M. Pompea**, and C. E. Walker, "Integrating Technology into Research-Based Science Education" GeoSciEd IV Conference, Calgary, Canada, Aug 11, 2003. (Poster)

112. S. K. Croft, **S. M. Pompea**, and S. M. McGee "Astronomy Village®: Investigating the Solar System: "Fun Science" In Middle School," GeoSciEd IV Conference, Calgary, Canada. Aug 11, 2003.
113. S. K. Croft and **S. M. Pompea**, "Teacher Leaders in Research-Based Science Education: a Successful National Science Initiative," U. S. Educational Seismology Network Workshop, Baltimore, MD, Sep 14, 2003. (Invited)
114. **S. M. Pompea**, "Rings Around the Chambered Nautilus: A Scientific Adventure Story," University of Arizona Science Teacher's Colloquium Series, September 25, 2003. (Invited Talk)
115. C. E. Walker, **S. M. Pompea** and S. Croft, "Optics Education through the Teacher Leaders in Research-Based Science Education Program," 8th International Conference on Education and Training in Optics and Photonics, October 7, 2003, Tucson, Arizona.
116. S. K. Croft, **S. M. Pompea**, and S. McGee, "Exploration and Application of Natural and Infrared Color Images in Middle School," 8th International Conference on Education and Training in Optics and Photonics, October 7, 2003, Tucson, Arizona.
117. **S. M. Pompea**, C.E. Walker, and E. Offerdahl, "Teaching the Electromagnetic Spectrum with the Invisible Universe GEMS Guide," 8th International Conference on Education and Training in Optics and Photonics, October 8, 2003, Tucson, Arizona.
118. **S. M. Pompea**, A. Johnson, E. Arthurs, and M. Tomasello, "Hands-On Optics (HOO)–Making an Impact with Light" 8th International Conference on Education and Training in Optics and Photonics, October 8, 2003, Tucson, Arizona. (Invited)
119. E. G. Offerdahl, K. S. Moore, and **S. M. Pompea** "Supporting Systemic Science Reform: Collaboration to Advance Teaching Technology and Science (CATTS) and the National Optical Astronomy Observatory" American Geophysical Union Fall meeting, San Francisco, Dec. 8-12, 2003. (Poster)
120. **S. M. Pompea**, S. K. Croft, C. E. Walker, J. Lockwood, D. McCarthy, T. Rector, S. Howell, "Implementing Authentic Astronomy Research in the Classroom: The TLRBSE Experience," American Geophysical Union, San Francisco, Dec. 8-12, 2003.
121. C. E. Walker, S. Croft, **S. M. Pompea**, C. Plymate, and D. McCarthy, "Solar Astronomy as a Means to Promote Authentic Science Research in a Teacher Professional Development Program," American Geophysical Union, San Francisco, Dec. 8-12, 2003.

122. S. K. Croft and **S. M. Pompea**, "Astronomy Village: Multimedia and Authentic Research in the Classroom" American Geophysical Union, San Francisco, Dec. 8-12, 2003 (Poster).
123. J. M. Keller, **S. M. Pompea**, E. E. Prather, T. F. Slater, W. V. Boynton, H. L. Enos, M. Quinn, "Educational Testing of an Auditory Display of Mars Gamma Ray Spectrometer Data," American Geophysical Union, Fall Meeting December 8-12, 2003. (Poster)
124. D. J. Norman, C. E. Walker, M. Smith, **S. M. Pompea**, D. Orellana "Exchanges Across the Equator," American Astronomical Society, Atlanta, January 6, 2004. (Poster)
125. T. F. Slater, M. Bennett, W. M. Greene, **S. M. Pompea**, E. Prather, "College Astronomy Teaching Excellence Workshops," American Astronomical Society, Atlanta, January 7, 2004. (Poster)
126. S. K. Croft, **S. M. Pompea**, and C. E. Walker, "Teacher Leaders in Research Based Science Education: K-12 Teacher Retention, Renewal, and Involvement in Professional Science". Poster at 35th Lunar & Planetary Science Conference, Houston, TX, March 15-19, 2004. (Poster)
127. S. K. Croft, **S. M. Pompea**, and S. M. McGee, "Astronomy Village: Use of Planetary Images in Educational Multimedia," 35th Lunar & Planetary Science Conference: Educational Program Demonstrations, Houston, TX, March 15-19, 2004. (Poster)
128. C. E. Walker, S. K. Croft, T. Rector, and **S. M. Pompea**, "Explosive Stars: Teaching Stellar Astronomy in Middle and High School," National Science Teachers Association National Meeting, Atlanta, GA, April 1-4 2004.
129. C. E. Walker, S. K. Croft, J. Lockwood, and **S. M. Pompea**, "Blazing Sunspots: Teaching Solar Astronomy in Middle and High School," National Science Teachers Association National Meeting, Atlanta, GA, April 1-4 2004.
130. C. E. Walker, S. K. Croft, T. Rector, and **S. M. Pompea**, "Nature's Most Powerful "Monsters:" Teaching Quasar Astronomy in Middle and High School," National Science Teachers Association National Meeting, Atlanta, GA, April 1-4 2004.
131. C. E. Walker, S. K. Croft, and **S. M. Pompea**, "Tales of the Night: Astronomy Research in the Classroom," National Science Teachers Association National Meeting, Atlanta, GA, April 1-4 2004.
132. G. Schultz, B. Mendez, L. Peticolas, A. Gould, **S. M. Pompea**, "Living with a Star and the Real Reasons for Seasons: NASA/GEMS Resources for Teaching About Sun-Earth Connections," Short Course, National Science Teachers

- Association National Meeting, Atlanta, GA, April 1-4 2004. (National Workshop)
133. C. E. Walker, L. Stefaniak, M. Gearen, C. J. Henney, F. Hill, **S. M. Pompea**, T. Stagg, and H. P. Jones, "DASL (Data and Activities for Solar Learning)" National Science Teachers Association National Meeting, Atlanta, GA, April 1-4 2004.
 134. **S. M. Pompea** and C. E. Walker, "Awesome Experiments in Light and Color," National Science Teachers Association National Meeting, Atlanta, GA, April 3, 2004.
 135. **S. M. Pompea**, "Perspectives on Engaging Scientists in Education and Public Outreach" (panel) and "Educational Uses of Technology," Space Science Institute's 10th Annual K-12 Education Workshop for Scientists, Engineers, and EPO Professionals, April 25-28 2004.
 136. **S. M. Pompea**, "Current Experiments in Science Education at the National Optical Astronomy Observatory (NOAO)". Talk at GLOBE Program project headquarters, Boulder CO, June 2, 2004.
 137. **S. M. Pompea**, "NOAO Experiments in Science Education: Lessons Learned," Aspen Center for Physics, July 6, 2004.
 138. **S. M. Pompea** and C. Walker, "Hands On Optics" Workshop, July 9-11, 2004, University of Southern California. (Workshop)
 139. **S. M. Pompea**, C. Walker, K. Garmany, "Creating a Center for Spanish Language Astronomy Materials," Cosmos in the Classroom 2004, Medford MA, July 16-18, 2004. (Poster)
 140. Johnson, **S. M. Pompea**, E. Arthurs, M. Tomasello, J. Briggs, "Hands-On Optics (HOO) Makes an Impact with Light - The Year in Review," Optical Society of America, Rochester, NY, October 12, 2004. (Invited)
 141. C. E. Walker, **S. M. Pompea**, M. Newhouse, G. Furnier, M. Peña, and J. Aceituno, "The Spanish Language Astronomy Materials Education Center," National Conference Society for the Advancement of Chicanos and Native Americans in Science, San Antonio, October 23, 2004.
 142. **S. M. Pompea**, D. Daou, and M. Thaller, "Design of a Teacher-Student Research Program Using the Spitzer Space Telescope, American Geophysical Union, San Francisco, December 13, 2004.
 143. C. E. Walker, **S. M. Pompea**, S. Croft, J. Lockwood, T. Rector, S. Howell, R. Acetta, "From Distance Learning to Research Experience: A Successful Model for Best practices in Research-Based Science Education," American Geophysical Union, San Francisco, December 15, 2004.

144. S. Croft, C. E. Walker, S. Howell, **S. M. Pompea**, "Teacher Observing Experiences: Deepening Teacher Professional Developments," American Geophysical Union, San Francisco, December 15, 2004.
145. S. H. Jacoby, L. M. Khandro, A. M. Larson, D. W. McCarthy, **S. M. Pompea**, and M. M. Shara, "Science Education with the LSST," American Astronomical Society, San Diego, January 12, 2005. (Poster)
146. D. Daou, **S. M. Pompea**, and M. Thaller, "Creating a Teacher-Student Research Program Using the Spitzer Space Telescope," American Astronomical Society, San Diego, January 12, 2005. (Poster)
147. C. E. Walker, **S. M. Pompea**, and S. K. Croft, and the NOAO Education Outreach Team, "Distance Learning as a Successful Means to Enable Research in the Classroom," American Astronomical Society, San Diego, January 12, 2005.
148. S. K. Croft, **S. M. Pompea**, C. E. Walker, and the NOAO Education Outreach Team, "Building an Astronomy Community to Sustain Research in the Classroom," American Astronomical Society, San Diego, January 12, 2005.
149. **S. M. Pompea**, "Hands-On Optics: Using Modules 1-3," New York Hall of Science, Flushing Meadows, New York, February 1, 2005. (Workshop)
150. **S. M. Pompea** and J. Bailey, "Hands On Optics" Modules 1, 2, and 3 Workshop for Teachers in California, University of Southern California, March 5, 2005. (Workshop)
151. S. K. Croft, A. Miller, **S. M. Pompea**, C. Walker, and K. Garmany, "Teacher Leaders in Research Based Science Education". Conference on Teacher Research Experiences, University of Rhode Island, Narragansett Bay Campus, April 24-27, 2005. (Poster)
152. S. K. Croft, **S. M. Pompea**, and T. Rector, "Nature's Most Powerful Monsters: Quasar Astronomy in High School," Workshop at the National Science Teachers Association National Meeting, Dallas, TX, April 2005. (National Workshop)
153. C. E. Walker, S. K. Croft, and **S. M. Pompea**, "Tales of the Sky, part 1," Presentation at the National Science Teachers Association National Meeting, Dallas, TX, April 2005.
154. C. E. Walker, S. K. Croft, and **S. M. Pompea**, "Tales of the Sky, part 2," Presentation at the National Science Teachers Association National Meeting, Dallas, TX, April 2005.

155. C. E. Walker, S. K. Croft, J. Lockwood, and **S. M. Pompea**, "Blazing Sunspots: Solar Astronomy in Middle and High School," Workshop at the National Science Teachers Association National Meeting, Dallas, TX, April 2005. (National Workshop)
156. **S. M. Pompea**, C. E. Walker, C. C. Peruta, B. A. Kinder, J. C. Aceituno, M. A. Pena, "Hands-On Optics: An Informal Education Program for Exploring Light and Color," American Astronomical Society, Minneapolis, Minnesota, May 29 – June 2, 2005. (Poster)
157. **S. M. Pompea**, C. E. Walker, and R. Sparks, "Hands On Optics" Modules 1, 2, and 3 Workshop for Teachers and Optics Professionals from California, Oregon, and Colorado, University of Southern California, July 29-31, 2005. (Workshop)
158. **S. M. Pompea**, C. E. Walker, and R. Sparks, "Hands On Optics" Modules 1, 2, and 3 Workshop for Teachers and Optics Professionals from California, Washington, and Maryland, Lawrence Livermore National Laboratory, August 5-7 2005. (Workshop)
159. **S. M. Pompea**, C. E. Walker "Hands On Optics: Making an Impact with Light" Society of Photo-Optical Instrumentation Engineers, San Diego, August 1, 2005.
160. **S. M. Pompea**, "Experiments, Best Practices, and Challenges in Science Education at NOAO," NASA Science Mission Directorate Education and Public Outreach Professional Retreat, September 13th, 2005. (Invited)
161. **S. M. Pompea**, "New Experiments in Astronomy Education at NOAO," StarTec Meeting, September 13th, 2005, Tucson, Arizona.
162. **S. M. Pompea** and C. E. Walker, "Light and Color as an Informal Avenue to Reach Underserved Students," Building Community: The Emerging EPO Profession, 117th Annual Meeting of the Astronomical Society of the Pacific, September 15, 2005. (Poster)
163. C. E. Walker, D. Orellana, **S. M. Pompea**, and D. Norman, "Tucson/Chilean Light Pollution Education Efforts: The Video Connection" Building Community: The Emerging EPO Profession, 117th Annual Meeting of the Astronomical Society of the Pacific, September 16, 2005. (Poster)
164. **S. M. Pompea**, D. Daou, M. Thaller, "Teachers, Research, and the Spitzer Space Telescope," Building Community: The Emerging EPO Profession, 117th Annual Meeting of the Astronomical Society of the Pacific, September 15, 2005. (Poster)
165. **S. M. Pompea**, A. Johnson, and E. Arthurs, "Hands-On Optics: Making an Impact with Light," Optical Society of America, October 19, 2005. (Workshop)

166. **S. M. Pompea**, C. E. Walker, and R. Sparks, "Hands On Optics" Modules 1 and 2 Workshop for Teachers and Optics Professionals from Arizona, October 21-22, 2005. (Workshop)
167. **S. M. Pompea**, A. Johnson, E. Arthurs, and C. E. Walker, "Hands-On Optics: An Educational Initiative for Exploring Light and Color in After-School Programs, Museums, and Hands-On Science Centers," 9th International Conference on Education and Training in Optics and Photonics, Marseille, France, October 26, 2005. (Invited).
168. **S. M. Pompea**, C. E. Walker, and C. Peruta, "Design and Evaluation of Optics Student Competitions and Contests for Maximal Educational Value," 9th International Conference on Education and Training in Optics and Photonics, Marseille, France, October 27, 2005.
169. S. K. Croft, **S. M. Pompea**, and R. T. Sparks, "Teacher and Student Research Using Large Data Sets," American Geophysical Union, San Francisco, December 6, 2005. (Poster)
170. **S. M. Pompea**, S.K. Croft, C. D. Garmany, and C. E. Walker, "Evolution of a Teacher Professional Development Program that Promotes Teacher and Student Research," American Geophysical Union, San Francisco, December 6, 2005.
171. **S. M. Pompea**, C. E. Walker, C. D. Garmany, and S. Howell, Two-Day Workshop for Spitzer Space Telescopes Research Program for Teachers and Students, American Astronomical Society, Washington DC, January 7-9, 2006.
172. S.H. Jacoby, K.D. Borne, C. A. Christian, S. Croft, O. DeMarco, V. L. Hoette, A. Larson, C.R. Pennypacker, **S. M. Pompea**, M. J. Raddick, W. Rosing, R. T. Sparks, and U. Thakkar, "LSST EPO: Bringing the Changing Universe to the Public," American Astronomical Society, Washington DC, January 9-12, 2005. (Poster)
173. **S. M. Pompea**, C. E. Walker, and R. T. Sparks, "Informal Activities with Lasers, Lights, and Lenses: The Hands-On Optics Project," American Astronomical Society, Washington DC, January 9-12, 2005. (Poster)
174. **S. M. Pompea**, J. M. Bailey C. E. Walker, and R. T. Sparks, "Development of Kits and Modules at NOAO for Optics Explorations," American Association of Physics Teachers, Anchorage Alaska, January 23, 2006.
175. S. K. Croft and **S. M. Pompea**, "Braving The Wilderness Of Rocks: Educational Outreach Among The Asteroids," 37th Lunar and Planetary Science Conference, League City, Texas, March 13-17, 2006. (Poster).

176. S. K. Croft and **S. M. Pompea**, "Astronomy Village: Experiencing the Process of Science in Multimedia," 37th Lunar and Planetary Science Conference, League City, Texas, March 13–17, 2006. (Poster).
177. C. E. Walker, **S. M. Pompea**, D. Isbell, D. Orellana, S. Henderson, K. K. Meymaris, and E. E. Geary, "GLOBE at Night: A Worldwide Program to Characterize Light Pollution," International Dark Sky Association Annual Meeting, March 15-17, 2006. (Poster)
178. C. E. Walker, S. K. Croft, **S. M. Pompea**, and J. Lockwood, "Blazing Sunspots—Their Lives and Times: A Solar Research Activity," Annual Meeting of the National Science Teachers Association, Anaheim, CA, April 6, 2006.
179. S. K. Croft, **S. M. Pompea**, and K. Garmany, "Teacher Leaders in Research-based Science Education: Teachers Astronomy Workshop at Kitt Peak National Observatory, Annual Meeting of the National Science Teachers Association, Anaheim, CA, April 07, 2006.
180. C. E. Walker, S. K. Croft, **S. M. Pompea**, and T. Rector, "Telling It Like It Is: Teachers Sharing Astronomy Research Experiences from the Classroom," Annual Meeting of the National Science Teachers Association, Anaheim, CA, April 7, 2006.
181. C. E. Walker, S. K. Croft, **S. M. Pompea**, and K. Garmany, "Using Astronomical Images and Data in the Classroom: Teacher Success Stories," Annual Meeting of the National Science Teachers Association, Anaheim, CA, April 7, 2006.
182. M. Thaller, D. Daou, and **S. M. Pompea**, "Teachers, Students, and the Spitzer Space Telescope" Annual Meeting of the National Science Teachers Association, Anaheim, CA, April 8, 2006.
183. S. Henderson, K. Meymaris, D. Ward, C. Walker, R. Russell, **S. M. Pompea**, and D. Salisbury, "Determining Light Pollution of the Global Sky: GLOBE at Night" American Geophysical Union, Joint Assembly, Baltimore, MD, 23-26 May, 2006 (Poster)
184. **S. M. Pompea**, C. E. Walker, R. T. Sparks, "Adaptation of the Hands-On Optics Activities for Small and Large Science Centers," American Astronomical Society, Calgary, June 5-8, 2006 (Poster).
185. C. E. Walker, **S. M. Pompea**, D. Isbell, D. Orellana, C. Blurton and S. Henderson, D. Ward, and K. Meymaris, "Results from the Prototype GLOBE at Night Worldwide Light Pollution Observation Program," American Astronomical Society, Calgary, June 5-8, 2006 (Poster)
186. **S. M. Pompea**, C. E. Walker, R. T. Sparks, "Hands-On Optics (HOO): Making an Impact with Light," Educational and Professional Development Workshop

- for SPIE members, SPIE Optics and Photonics Meeting, San Diego, CA, August 14, 2006.
187. C. E. Walker, **S. M. Pompea**, D. Isbell, M. Smith, H. Ochoa, D. Orellana, C. Blurton, S. Henderson, D. Ward, and K. Meymaris, "The Recent Globe at Night Initiative Involving Schoolchildren and Families from 96 Countries," Special Session 2 - Innovation in Teaching/Learning Astronomy Methods, IAU Prague August 17-18, 2006.
 188. C. E. Walker, **S. M. Pompea**, D. Isbell, D. Orellana, C. Blurton, D. Ward, K. Meymaris, and S. Henderson, "GLOBE at Night: Results from a Prototype Worldwide Light Pollution Monitoring Program" Astronomical Society of the Pacific 118th Annual Meeting, Baltimore, MD Sept. 16-18, 2006. (Poster)
 189. R. Probst, C. E. Walker, D. Isbell, **S. M. Pompea**, H. Ochoa, D. Norman, D. Orellana, and A. Garcia, "Student Videoconference on Remote Sensing Has Far-Reaching Results Across the Equator" Astronomical Society of the Pacific 118th Annual Meeting, Baltimore, MD Sept. 16-18, 2006. (Poster)
 190. **S. M. Pompea**, C. E. Walker, and R. T. Sparks, "Hands-On Optics Activities for Informal Astronomy Education Partnerships" Astronomical Society of the Pacific 118th Annual Meeting, Baltimore, MD Sept. 16, 2006. (Workshop)
 191. S. Croft, **S. M. Pompea**, and R. Sparks, "Students Among the Asteroids at NOAO" Astronomical Society of the Pacific 118th Annual Meeting, Baltimore, MD Sept. 16-18, 2006. (Poster)
 192. R. Sparks, E. Dokter, **S. M. Pompea**, C. E. Walker, "Hands-On Optics at the Boys and Girls Club," Astronomical Society of the Pacific 118th Annual Meeting, Baltimore, MD Sept. 16-18, 2006. (Poster)
 193. **S. M. Pompea**, "Making the Best of Both: Professional Development on-Site and On-Line," Association of Science Technology Centers, Panel and discussion, October 31, 2006, Louisville, Kentucky.
 194. D. Ward, S. Henderson, K. Meymaris, C. Walker, **S. M. Pompea**, S. Gallagher, R. Russel, and D. Salisbury, "The Citizen-Scientist as Data Collector: GLOBE at Night, Part 1," American Geophysical Union, San Francisco, December 14, 2006. (Poster)
 195. C. E. Walker, **S. M. Pompea**, D. Ward, S. Henderson, K. Meymaris, S. Gallagher, and D. Salisbury, "The Citizen-Scientist as Data Collector: GLOBE at Night, Part 2 : An Innovative Program to Realize Light Pollution Education," American Geophysical Union, San Francisco, December 14, 2006. (Poster)
 196. **S. M. Pompea**, C. Garmany, C. E. Walker, and S. K. Croft, "Astronomy in Research-Based Science Education (A-RBSE): A Review of a Decade of Professional Development Programs in Support of Teacher and Student

- Research at the National Optical Astronomy Observatory” American Geophysical Union, San Francisco, December 11, 2006. (Poster)
197. S. K. Croft and **S. M. Pompea**, “Out Among the Asteroids – Research Experiences for Middle School,” American Geophysical Union, San Francisco, December 11, 2006.
 198. N. Demuth, C. E. Walker, D. Isbell, and **S. M. Pompea**, “A New Educational Scaffolding Approach to Support Authentic Solar Research in the Classroom” , American Geophysical Union, San Francisco, December 11, 2006.
 199. R. Probst, C. E. Walker, C. Martin, B. Dorame, H. Ochoa, D. Orellana, D. Isbell, and **S. M. Pompea**, “Remote Sensing across the Globe: Best Practices in Bringing Together Satellite Imagery, Telecommunications and Ground-Truth Observation,” American Geophysical Union, San Francisco, December 14, 2006. (Poster)
 200. **S. M. Pompea**, C. E. Walker, and R. T. Sparks, “Middle School Optics Education: Hitting the Target or Impedance Mismatch?” Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 7, 2006 (Invited).
 201. E. F. Dokter, C. Walker, C. Peruta, C. Ubach, R. Sparks, and **S. M. Pompea**, “Science beyond the Classroom: Hands-On Optics and the Boys and Girls Club” Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 7, 2006. (Invited)
 202. R. T. Sparks, S. Croft, and **S. M. Pompea**, “Asteroids and LSST EPO, Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 7, 2006.
 203. C. E Walker, N. DeMuth, D. Isbell, **S. M. Pompea**, and K. Garmany, “Never Fear; Scaffolding is Here: Solar Research in the Classroom” Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 7, 2006. (Poster)
 204. C. E. Walker, R. Probst, C. Martin, B. Dorame, D. Isbell, **S. M. Pompea**, H. Ochoa, D. Orellana, and A. Garcia, “Student-Scientists use Remote Sensing to Reach Across the Equator” Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 8, 2006. (Poster)
 205. C. E. Walker, **S. M. Pompea**, D. Isbell, D. Orellana, D. Ward, S. Henderson, K. Meymaris, S. Gallagher, and D. Salisbury, “Citizen-Scientists Monitor Light Pollution Worldwide via "GLOBE at Night" Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 8, 2006. (Poster)

206. C. E. Walker, R. Sparks, **S. M. Pompea**, "Affordable Laser Communication in the Classroom" Joint Meeting of the American Astronomical Society and the American Association of Physics Teachers, Seattle Washington, January 10, 2006.
207. **S. M. Pompea** and A. Johnson, "Wonder and Knowledge: Strategies for Encouraging Investigations of Light and Color in Informal Settings," National Science Foundation, Washington DC, January 17, 2007 (Invited)
208. **S. M. Pompea** and C. E Walker, "Strategies for Effective Light Pollution Education and Outreach Programs" Why the Dark Hours are So Important Conference, Washington DC February 21, 2007. (Invited)
209. S. K. Croft, and **S. M. Pompea**, "Exploring the Wilderness of Rocks: Asteroids in the Earth Science Classroom," National Science Teachers Association Annual Meeting, St. Louis, Missouri, March 29, 2007. (Workshop)
210. K. Garmany, **S. M. Pompea**, and T. Rector, "Astronomy Research Opportunities for Middle and High School Students Through Kitt Peak National Observatory" National Science Teachers Associations Annual Meeting, St. Louis, Missouri, March 30, 2007 (Workshop).
211. C. E. Walker, D. Isbell, and **S. M. Pompea**, "Globe At Night 2007: Light Pollution Awareness and the Citizen-Scientist," American Astronomical Society, Honolulu, Hawaii, May 28, 2007 (Poster)
212. R. T. Sparks, C. Peruta, C. Ubach, C. E. Walker, and **S. M. Pompea**, "Building Student Interest Through Optics Competition," American Astronomical Society, Honolulu, Hawaii, May 28, 2007 (Poster)
213. C. E. Walker, R. T. Sparks, and **S. M. Pompea**, "Hands-On Optics Science Camps and Clubs," Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007.
214. **S. M. Pompea**, and C. E. Walker, and R. T. Sparks, "Bringing Optics Education Programs to Hands-On Science Centers," Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007.
215. C. E. Walker, R. T. Sparks, and **S. M. Pompea**, "Optics Education in the International Year of Astronomy," Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007.
216. R. T. Sparks, **S. M. Pompea**, and C. E. Walker, "The Development of a Low-Cost Laser Communication System for Classroom Use," Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007.

217. **S. M. Pompea**, E. F. Dokter, C. E. Walker, and R. T. Sparks, "Using Misconceptions Research in the Design of Optics Instructional Materials and Teacher Professional Development Programs," Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007.
218. **S. M. Pompea**, "Hands-On Optics: From Art to Science in Discovering Light and Color" Education and Training in Optics and Photonics 2007, Ottawa, Canada, June 3-5, 2007. (Plenary)
219. M. Johnson, **S. M. Pompea**, E. G. Arthur, C. E. Walker, and R. T. Sparks, "Hands-on Optics: An Informal Science Education Initiative" SPIE San Diego August 2007.
220. R. T. Sparks, **S. M. Pompea**, and C. E. Walker, "Adaptive Optics Educational Outreach and the Giant Segmented Mirror Telescope," Astronomical Society of the Pacific Annual Meeting, September 5, 2007. (Poster)
221. C. E. Walker, **S. M. Pompea**, R. T. Sparks, and C. Bueter, "Visualizing the Sky and the National Virtual Observatory: Enabling Education and Public Outreach through Large Astronomical Data Sets and Archives" Astronomical Society of the Pacific Annual Meeting, September 5, 2007. (Workshop)
222. **S. M. Pompea**, C.E. Walker, and R.T. Sparks, "Using the Hands-On Optics Terrific Telescopes Kit in the International Year of Astronomy," Astronomical Society of the Pacific Annual Meeting, September 5, 2007. (Workshop)
223. S. K. Croft and **S. M. Pompea**, "Astronomy Village: Innovative Uses of Planetary Astronomy Images and Data" Astronomical Society of the Pacific Annual Meeting, September 5, 2007. (Workshop)
224. C. Peruta, E. Dokter, C. E. Walker, R. T. Sparks, and **S. M. Pompea**, "Hands-On Optics in Informal Settings: Science Camps," Astronomical Society of the Pacific Annual Meeting, September 6, 2007. (Poster).
225. S. Croft, R. Sparks, **S. M. Pompea**, "Wilderness of Rocks Asteroid Project," Astronomical Society of the Pacific Annual Meeting, September 6, 2007. (Poster)
226. **S. M. Pompea**, R. Fienberg, S. Deustua, and D. Isbell "Telescope Kits & Optics Challenges for the International Year of Astronomy 2009," Astronomical Society of the Pacific Annual Meeting, September 6, 2007. (Poster)
227. C. E. Walker, **S. M. Pompea**, and D. Isbell, "GLOBE at Night 2.0: on the Road Toward IYA2009," Astronomical Society of the Pacific Annual Meeting, September 6, 2007. (Poster)

228. R. T. Fienberg and **S. M. Pompea**, "Progress toward a Decent-Quality "Cheapscope" for IYA 2009," Communicating Astronomy with the Public 2007, October 8-11, 2007, Athens. (Poster)
229. C. E. Walker, D. Isbell and **S. M. Pompea**, "GLOBE at Night: an Update and Look Ahead to IYA," Communicating Astronomy with the Public 2007, October 8-11, 2007, Athens.
230. **S. M. Pompea**, "Hands-On Optics: Making an Impact with Light," International Workshop on Science Education in School," October 12, 2007, Bucharest, Romania. (Invited)
231. **S. M. Pompea**, "Astronomy Education at the US National Optical Astronomy Observatory: A Portfolio of Sustainable Educational Experiments," International Workshop on Science Education in School," October 12, 2007, Bucharest, Romania. (Invited)
232. **S. M. Pompea**, "GLOBE at Night: Classic and Digital Observations by Citizen Scientists," Pardee Keynote Symposium "Creating Citizen Scientists: Needs and Opportunities to Engage the Public in the Process of Science," Geological Society of America Annual Meeting, Denver, Colorado, October 29, 2007. (Invited)
233. S. K. Croft and **S. M. Pompea**, "Wilderness of Rocks–Asteroid Science in Middle School," Geological Society of America Annual Meeting, Denver, Colorado, October 31, 2007.
234. L. M. Rebull, T. Spuck, V. Gorjian, L. Hermans, S. Howell, D. Isbell, **S. Pompea**, G. Rudnick, M. Thaller, D. Backman, "The Spitzer Space Telescope Research Program for Teachers and Students as a Potential Component of SOFIA's Outreach Efforts" SOFIA 2020 Vision Workshop, 2007.
235. S. K. Croft and **S. M. Pompea**, "Astronomy Village Reaches for New Heights" American Geophysical Union, San Francisco, December 13, 2007.
236. C. E. Walker, D. Isbell, and **S. M. Pompea**, "Dark Skies as a Universal Resource: Citizen Scientists Measuring Sky Brightness" American Geophysical Union, San Francisco, December 10, 2007. (Invited)
237. S. K. Croft and **S. M. Pompea**, "Problem-based Simulations for the GSMT," American Astronomical Society, January 2008 Austin, Texas. (Poster)
238. R. T. Sparks, **S. M. Pompea**, S. Johnson, and O. L. A. Monti. "Promoting Inquiry Through Science Education: A Partnership With the Navajo Nation," January 2008 Austin Texas (Poster).
239. C. E. Walker, D. Isbell, and **S. M. Pompea**, and the USA IYA Dark Skies Working Group, "Dark Skies Ahead? -Activities to Raise Awareness during the

- International Year of Astronomy," American Astronomical Society, January 2008, Austin, Texas (Poster).
240. L. M. Rebull, V. Gorjian, L. Hermans, S. Howell, D. Isbell, **S. Pompea**, G. Rudnick, and M. Thaller, Spitzer Teacher Program Team, "The Spitzer Space Telescope Research Program for Teachers and Students: Overview," American Astronomical Society, January, 2008 Austin, Texas (Poster).
 241. J. G. Manning, S. Gurton, A. Hurst, M. Berendsen, M. Storksdieck, K. Haley-Goldman, J. Stein, **S. Pompea**, C. Garmany, R. Sparks, W. Pollock, "Interactions and Interventions: Current Research on Improving Informal Astronomy Education via the Astronomical Society of the Pacific (ASP)," American Astronomical Society, January 2008, Austin, Texas.
 242. **S. M. Pompea**, R. T. Fienberg, D. Isbell, and S. Deustua, "Telescope Kits: A Teaching Vehicle for the International Year of Astronomy," American Astronomical Society, January, 2008 Austin, Texas (Poster).
 243. S. K. Croft, R. Sparks, and **S. M. Pompea**, "Asteroids and Earth Science" National Science Teachers National Conference, Boston, Massachusetts, March 27, 2008 (Workshop)
 244. **S. M. Pompea**, "NSTA's Exemplary Science Program (ESP): Knowledge and Wonder: Engagements with Light and Color in the Hands-On Optics Project: National Science Teachers National Conference, Boston, Massachusetts, March 28, 2008.
 245. R. T. Sparks, **S. M. Pompea**, and C. E. Walker, "Building a Telescope from the Ground Up," Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, June 1, 2008. (Workshop)
 246. C. E. Walker, C. Bueter, **S. M. Pompea**, K. Berglund, T. Mann, P. Gay, B. Crelin, D. Collins, and R. T. Sparks, "Dark Skies from the Ground Up: Activities to Raise Awareness During IYA" Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, June 1, 2008. (Workshop)
 247. **S. M. Pompea**, R. T. Fienberg, D. Arion, T. Smith, and D. Isbell, "Progress on Creating the "Galileoscope" for the International Year of Astronomy," Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, June 2, 2008.
 248. R. T. Sparks, **S. M. Pompea**, and C. E. Walker, "Using the Hands-On Optics Terrific Telescopes Kit in The International Year of Astronomy," Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, June 3, 2008.

249. C. E. Walker, C. Bueter, **S. M. Pompea**, K. Berglund, T. Mann, P. Gay, B. Crelin, D. Collins, and R. Sparks, "Dark Skies are a Universal Resource: IYA Programs on Dark Skies Awareness," Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, June 4, 2008.
250. **S. M. Pompea**, R. T. Sparks, and C. E. Walker, "Maintaining and Expanding the Hands-On Optics Program" Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, May 31-June 5, 2008. (Poster)
251. **S. M. Pompea**, R. T. Sparks, and D. Isbell, "Teaching Optics With Small Telescopes During the International Year of Astronomy" Astronomical Society of the Pacific Symposium on Preparing for the International Year of Astronomy, American Astronomical Society, St. Louis, Missouri, May 31-June 5, 2008. (Poster)
252. **S. M. Pompea**, "Lessons Learned in Supporting Student and Teacher Research at NOAO," American Geophysical Union, San Francisco, December 16, 2008.
253. C. E. Walker and **S. M. Pompea**, "GLOBE at Night: a Citizen Science, Dark Skies Awareness Star Hunt during the International Year of Astronomy," American Geophysical Union, San Francisco, December 18, 2008. (Poster)
254. C. E. Walker and **S. M. Pompea**, "Dark Skies Awareness Programs for the International Year of Astronomy," American Geophysical Union, San Francisco, December 19, 2008.
255. **S. M. Pompea** and D. Isbell, "Strategies for Creating Cornerstone Education Projects for the International Year of Astronomy 2009," American Geophysical Union, San Francisco, December 19, 2008. (Invited)
256. D. N. Arion, T. Smith, R. Fienberg, and **S. M. Pompea**, "The Design and Production of the Galileoscope for the International Year of Astronomy," American Astronomical Society, Long Beach, California, January 4-8, 2009.
257. C. E. Walker, D. Isbell, **S. M. Pompea**, D. A. Smith, and T. Baker, "Globe At Night: A Dark-skies Awareness Campaign During The International Year Of Astronomy," American Astronomical Society, Long Beach, California, January 4-8, 2009.
258. **S. M. Pompea**, R. T. Sparks, and C. E. Walker, "Reaching Diverse Audiences through NOAO Education Programs" American Astronomical Society, Long Beach, California, January 4-8, 2009. (Poster)

259. R. T. Sparks and **S. M. Pompea**, "A New Adaptive Optics Educational Module," American Astronomical Society, Long Beach, California, January 4-8, 2009. (Poster)
260. **S. M. Pompea**, R. T. Fienberg, D. N. Arion, and T. C. Smith, "The Galileoscope: An Innovative Student Telescope Kit for the International Year of Astronomy American Astronomical Society, Long Beach, California, January 4-8, 2009. (Invited)
261. **S. M. Pompea**, "The International Year Of Astronomy 2009: A Creative Opportunity For Reaching New Audiences, National Society of Black Physicists/National Society of Hispanic Physicists 2009, Nashville, Tennessee, February 12, 2009. (Invited)
262. D. N. Arion, R. T. Fienberg, **S. M. Pompea**, and T. C. Smith, "The Galileoscope: Bringing the Sky to Millions Around the World," AAAS/American Association of Physics Teachers, Chicago, Illinois, February 16, 2009. (Invited Talk)
263. **S. M. Pompea**, "Design, Educational Impact, and Assessment of IYA Cornerstone Programs," AAAS/American Association of Physics Teachers, Chicago, Illinois, February 16, 2009. (Invited)
264. **S. M. Pompea**, R. T. Sparks, and E. Dokter, "Improving Student Problem Solving Skills using Site Selection Activities for the GSMT," American Astronomical Society, Pasadena, California, June 7-11, 2009. (Poster)
265. R. T. Sparks and **S. M. Pompea**, "The Galileoscope Photo and Drawing Contest," American Astronomical Society, Pasadena, California, June 7-11, 2009. (Poster)
266. C. E. Walker, **S. M. Pompea**, and D. Isbell, "Shedding Light on Light Pollution: Reports from GLOBE at Night," American Astronomical Society, Pasadena, California, June 7-11, 2009.
267. **S. M. Pompea**, R. Fienberg, and D. Arion, "Galileoscope," American Astronomical Society, Pasadena, California, June 7-11, 2009. (Invited)
268. **S. M. Pompea**, "International Year of Astronomy: Can We Keep the Party Going?," ASP Annual Meeting "Science Education and Outreach: Forging a Path to the Future," Sept. 12-16, 2009, Milbrae, California (Plenary Panel)
269. Richard Fienberg, **S. M. Pompea**, D. N. Arion, T. Smith, and R. Sparks, "The Galileoscope: Gateway to a Lifelong Interest in Astronomy," ASP Annual Meeting "Science Education and Outreach: Forging a Path to the Future," Sept. 12-16, 2009, Milbrae, California.

270. C.E. Walker, R. Sparks, **S. M. Pompea**, B. R. Chou, and P. Mortfield, "Building on IYA: The Dark Skies Awareness Program," ASP Annual Meeting "Science Education and Outreach: Forging a Path to the Future," Sept. 12-16, 2009, Milbrae, California (National Workshop).
271. **S. M. Pompea**, A. Schweitzer, S. Deustua, D. Isbell, Rick Fienberg, Doug Arion, and C. E. Walker, "International Year of Astronomy 2009 Cornerstone Projects: What's Available for You," ASP Annual Meeting "Science Education and Outreach: Forging a Path to the Future," Sept. 12-16, 2009, Milbrae, California (Invited)
272. R. Sparks, C. E. Walker, **S. M. Pompea**, R. T. Fienberg, and D. N. Arion, "Building on the International Year of Astronomy: The Galileoscope Program," ASP Annual Meeting "Science Education and Outreach: Forging a Path to the Future," Sept. 12-16, 2009, Milbrae, California (National Workshop)
273. **S. M. Pompea**, "Galileoscopes around the World," Association and Science Technology Centers Annual Meeting, November 3, 2009 (Talk and Session).
274. **S. M. Pompea**, "Exemplary Science Programs in Informal Education Settings: Hands-On Optics/Galileoscope," National Science Teachers Association Meeting, Phoenix, Arizona December 3, 2009. (Invited)
275. C.E. Walker, R. T. Sparks, and **S. M. Pompea**, "The Galileoscope and the International Year of Astronomy" National Science Teachers Association Meeting, Phoenix, Arizona December 5, 2009 (National Workshop)
276. **S. M. Pompea**, R. Sparks, and C. E. Walker, "The Role of the Galileoscope Telescope Kit in the NOAO Education and Public Outreach Program: Present and Future" American Geophysical Union Meeting, San Francisco December 18, 2009 (Poster).
277. **S. M. Pompea**, "Are Exemplary Education Projects Sustained or Overruled? Lessons from the TLRBSE and Hands-On Optics Projects on How to Sustain Projects through an Evolutionary Process," American Geophysical Union Meeting, San Francisco, December 16, 2009. (Poster)
278. C. E. Walker, **S. M. Pompea**, and R. Sparks, "Teacher Professional Development Program for an Authentic Citizen-Science Program: GLOBE at Night," American Geophysical Union Meeting, San Francisco December 16, 2009.
279. C E Walker, **S. M. Pompea**, and D. Isbell, "Worldwide Impact: International Year of Astronomy Dark Skies Awareness Programs" American Geophysical Union Meeting, San Francisco December 17, 2009.

280. **S. M. Pompea**, S. Deustua, J. Pasachoff, and P. Plait, "Evaluating the Success and Impact of EPO Efforts," NSF Astronomy & Astrophysics Postdoctoral Fellows 2010 Symposium – Washington, DC, January 3, 2010 (Panel).
281. T. Spuck, **S. M. Pompea**, L. Rebull, V. Gorjian, S. Howell, C. Johnson, S. Kennedy, B. Thomas, M. Walentosky, and S. Wheeler, "Impact Summary: The Spitzer Space Telescope Research Program for Teachers and Students" American Astronomical Society, Washington DC Jan. 4-7, 2010 (Poster).
282. **S. M. Pompea**, R.T. Fienberg, and D. N. Arion, "Reflections on the Galileoscope Program: Goals, Challenges, Achievements, and Future Directions," American Astronomical Society, Washington DC Jan. 4-7, 2010. (Invited).
283. R.T. Fienberg, **S. M. Pompea**, and D. N. Arion, "Long Live the Galileoscope," Communicating Astronomy with the Public 2010-Building on the International Year of Astronomy 2009, Capetown, South Africa, March 17, 2010.
284. **S. M. Pompea** and C. Dugan, "The Galileoscope," Talk and workshop at Project ASTRO Site Leaders Meeting, San Francisco, May 15, 2010.
285. **S. M. Pompea** and R. Sparks, "The Galileoscope: Bringing Telescope Optics Down to Earth," SPIE Astronomical Instrumentation Short Course, San Diego, June 27, 2010.
286. **S. M. Pompea**, R. N. Pfisterer, K. S. Ellis, D. N. Arion, and R. T. Fienberg, "Optical and System Engineering in the Development of a High-Quality Student Telescope Kit," SPIE: Modeling, Systems Engineering, and Project Management for Astronomy IV, San Diego, June 27, 2010.
287. R. N. Pfisterer, K. S. Ellis, and **S. M. Pompea**, "The Role of Stray Light Modeling and Analysis in Telescope System Engineering, Performance Assessment, and Risk Abatement," SPIE: Modeling, Systems Engineering, and Project Management for Astronomy IV, San Diego, June 29, 2010.
288. **S. M. Pompea**, "Assessment of Black and Spectrally Selective Surfaces for Stray Light Reduction in Telescope Systems," SPIE: Modern Technologies in Space- and Ground-based Telescopes and Instrumentation, San Diego, July 1, 2010.
289. E. F. C. Dokter, **S. M. Pompea**, R. T. Sparks, and C. E. Walker, "The Development of Formative Assessment Probes for Optics Education," SPIE: Optics Education and Outreach, San Diego, August 1, 2010.
290. R. T. Sparks, **S. M. Pompea**, C. E. Walker, and E. F. C. Dokter, "Teaching Adaptive Optics Concepts in the High School Classroom Using an Active Engagement, Experimental Approach," SPIE: Optics Education and Outreach, San Diego, August 1, 2010.

291. C. E. Walker, **S. M. Pompea**, R. T. Sparks, and E. F. C. Dokter, "Teaching Illumination Engineering Using Light Pollution Education Kits," SPIE: Optics Education and Outreach, San Diego, August 1, 2010.
292. **S. M. Pompea**, R. T. Sparks, C. E. Walker, and E. F. C. Dokter, "An Optics Education Program Designed Around Experiments with Small Telescopes," SPIE: Optics Education and Outreach, San Diego, August 1, 2010.
293. D. Barringer, C. E. Walker, **S. M. Pompea** and R. T. Sparks, "Astronomy Meets the Environmental Sciences: Using GLOBE at Night Data," Astronomical Society of the Pacific, Boulder, Colorado, July 31-August 4, 2011.
294. C. E. Walker, **S. M. Pompea** and R. T. Sparks, "Astronomy Meets the Environmental Sciences: Activities for Informal and Formal Educational Settings," Astronomical Society of the Pacific, Baltimore Maryland, August 1-3, 2011.
295. C. E. Walker, **S. M. Pompea** and R. T. Sparks, "Dark Skies From the Ground Up: Before, During and After GLOBE at Night," Astronomical Society of the Pacific, Boulder, Colorado, July 31-August 4, 2011.
296. **S. M. Pompea** R. T. Sparks, and C. E. Walker, "Integrating the Galileoscope into the College Classroom," Astronomical Society of the Pacific, Boulder, Colorado, July 31-August 4, 2011.
297. **S. M. Pompea** R. T. Sparks, and C. E. Walker, "Teaching with Galileoscopes and other Small Telescopes," Astronomical Society of the Pacific, Boulder, Colorado, July 31-August 4, 2011.
298. **S. M. Pompea** and R. T. Sparks, "The Galileoscope Star Party Project: Experiments using the Galileoscope to Engage the Public in Astronomy," Association of Science Technology Centers annual meeting, Honolulu, Hawai'i, September 30-October 6, 2010 (Poster).
299. **S. M. Pompea**, V. Gorjian, and P. Pittman, "Program Summary: The Spitzer Space Telescope Research Program for Teachers and Students," 2010 Teacher Research Experience Conference, Washington DC, October 22, 2010 (Poster).
300. **S. M. Pompea**, V. Gorjian, and P. Pittman, "The Spitzer Space Telescope Research Program for Teachers and Students: Teacher Research Experiences and Outcomes," 2010 Teacher Research Experience Conference, Washington DC, October 22, 2010 (Poster).
301. **S. M. Pompea**, "Choosing and Using Binoculars in Astronomy," XIII Congreso Internacional De Aficionados A La Astronomía CIAA-2010, Clase Magistral, Vicuna, Chile, November 4, 2010.

302. **S. M. Pompea**, "Knowledge and Wonder: From Hands-On Optics to Teaching with Telescopes," Exemplary Science Program (ESP): Meeting the Reform Features from the National Science Education Standards, National Science Teachers Association, Baltimore, November 12, 2010 (Invited).
303. **S. M. Pompea**, "Knowledge and Wonder: Why Teaching with Telescopes Works," Exemplary Science Program (ESP): Meeting the Reform Features from the National Science Education Standards, National Science Teachers Association, Nashville, December 5, 2010 (Invited).
304. C. E. Walker, **S. M. Pompea**, and R. T. Sparks, "GLOBE at Night: Raising Public Awareness and Involvement through Citizen Science," American Geophysical Union, San Francisco, December 13, 2010 (Poster)
305. **S. M. Pompea**, "Designing Citizen Science Projects in the Era of Mega-Information and Connected Activism," American Geophysical Union, San Francisco, December 13, 2010 (Poster).
306. C. E. Walker and **S. M. Pompea**, "Dark Skies Awareness Cornerstone Project for the International Year of Astronomy," American Geophysical Union, San Francisco, December 14, 2010 (Poster).
307. J. Manning, S. Gurton, A. Hurst Schmitt, **S. Pompea**, M. Glass, and K. Haley, "Assessing Workshop Models for Informal Educators: ASP's "Astronomy from the Ground Up" Experiment," American Astronomical Society, Seattle, January 11, 2011.
308. **S. M. Pompea**, K. B. Marvel, R. T. Fienberg, D. N. Arion, A. Herrold, B. Kruse, R. T. Sparks, and C. Dugan, "The Edelman Galileoscope Education Program: A Collaboration Among Professional Societies," American Astronomical Society, Seattle, January 11, 2011 (Poster).
309. R. T. Sparks and **S. M. Pompea**, "Teaching Astronomy with Small Telescopes in Informal Settings," National Science Teachers Association Annual Meeting, San Francisco, March 11, 2011.
310. R. T. Sparks and **S. M. Pompea**, "Collaborative Problem Solving with "Hands-On Optics" National Science Teachers Association Annual Meeting, San Francisco, March 11, 2011.
311. R. T. Sparks, **S. M. Pompea**, and C.E. Walker "Easy Optics Demonstration," National Science Teachers Association Annual Meeting, San Francisco, March 11, 2011.
312. C. Walker and **S. M. Pompea**, "National Education Program for Energy Efficient Illumination Engineering, SPIE Eco-Photonics 2011: Sustainable Design, Manufacturing, and Engineering Workforce Education for a Green Future, March 29, 2011, Strasbourg, France (Invited)

313. **S. M. Pompea**, L. W. Fine, and P. Meystre, "Photonics Education for a Green Future: Connecting the Dots of the Arizona STEM Education Experiment, SPIE Eco-Photonics 2011: Sustainable Design, Manufacturing, and Engineering Workforce Education for a Green Future, March 29, 2011, Strasbourg, France (Invited)
314. R. T. Sparks, C. E. Walker, and **S. M. Pompea**, "Integration of Galileoscopes into a Large MathMovesU Program," American Astronomical Society, Boston, MA May 22-26, 2011 (Poster).
315. **S. M. Pompea**, R. T. Sparks, C. Dugan, E. Dokter, and K. Schindler, "The Flagstaff Star Party Model for Using Galileoscopes: Evaluation Report," American Astronomical Society, Boston, MA May 22-26, 2011 (Poster).
316. C. E. Walker, R. T. Sparks, and **S. M. Pompea**, "Engaging the Public in the Citizen Science GLOBE at Night Campaign," American Astronomical Society, Boston, MA May 22-26, 2011 (Poster)
317. **S. M. Pompea**, "Connecting the Dots: Astronomy Connecting Cultures and People—Star Parties and Night Experiences," Cosmic Serpent Culminating Conference, Taos, New Mexico May 3, 2011
318. R. T. Sparks, **S. M. Pompea**, D. A. Lubowich, J. S. Kendall, K. Moore, and C. E. Walker, "Best Practices for School and Community Star Parties," Astronomical Society of the Pacific Annual Meeting, Baltimore Maryland, August 2, 2011. (Special Interest Group Discussion)
319. B. Mendez, **S. M. Pompea**, B. Mattson, L. Rebull, L. Peticolas, A. Gould, P. Udomprasert, T. Matilsky, S. Sunbury, and P. Miller, "Data in the Classroom: Promoting STEM Learning in Formal Education Using Real Space Science Data," Astronomical Society of the Pacific Annual Meeting, Baltimore Maryland, August 2, 2011. (Special Interest Group Discussion)
320. C. E. Walker, R. T. Sparks, and **S. M. Pompea**, "GLOBE at Night: Updates in Bringing Dark Skies Awareness to Your Community," Astronomical Society of the Pacific, Baltimore Maryland, August 1-3, 2011.
321. **S.M. Pompea**, C.E. Walker, and R. Sparks, "Best Practices in Organizing a Cadre of Undergraduate Science Outreach Students," American Geophysical Union, San Francisco, December 7, 2011 (Poster)
322. C. E. Walker and **S. M. Pompea**, "GLOBE at Night: a Worldwide Citizen-Science Program to Increase Awareness of Light Pollution by Measuring Night Sky Brightness," American Geophysical Union, San Francisco, December 8, 2011.

323. C.E. Walker, A. Fersch, D. Barringer, and **S. M. Pompea**, "Proto-Typing Research Aimed for Secondary School Students and Teachers," American Geophysical Union, San Francisco, December 9, 2011. (Poster)
324. **S. M. Pompea**, J. Seguel, R. Sparks, L. Opazo, and C. E. Walker, "Design of a Teacher Professional Development Program for International Collaborative Astronomy Research in Chile," American Geophysical Union, San Francisco, December 9, 2011. (Poster)
325. C. E. Walker, **S. M. Pompea**, R. T. Sparks, and M. Newhouse "Seeing Stars: A GLOBE at Night Campaign Update, American Astronomical Society, Austin, Texas January 11, 2012. (Poster)
326. C. A. Welling, **S. M. Pompea**, and R. Sparks, "Alternative Mounting Systems for the Galileoscope," American Astronomical Society, Austin Texas January 11, 2012. (Poster)
327. **S. M. Pompea**, "Contaminación Lumínica, Astronomía, Medioambiente y Desarrollo Sustentable," Estrategias Practicas Educativas para el Desarrollo Sustentable de la Region de Coquimbo, La Serena, Chile, June 27, 2012.
328. D. Lubowich, R. T. Sparks, **S. M. Pompea**, J. S. Kendall, and C. Dugan, "Outreach for Large and Unique Audiences," Astronomical Society of the Pacific Annual Meeting, August 6, 2012.
329. R. T. Fienberg, D. N. Arion, and **S. M. Pompea**, "Three Years after the IYA: An Update on the Galileoscope Project," Astronomical Society of the Pacific Annual Meeting, August 6-8, 2012. (Poster)
330. R. Sparks, K. Garmany, J. M. Siquieros, C. L. Austin, **S. M. Pompea**, and C. E. Walker, "An After School Education Program on the Tohono O'odham Nation," Astronomical Society of the Pacific Annual Meeting, August 6-8, 2012 (Poster)
331. **S. M. Pompea**, R. Fienberg, C. Impey, T. Lauer, and J. Ruiz, "Saving Hubble" Movie Panel Discussion, Hubble Road Show, Astronomical Society of the Pacific Annual Meeting, August 8, 2012 (Panel Moderator)
332. R. Sparks, C. Walker, and **S. M. Pompea**, "The Development of a Light and Color Teaching Kit for Astronomy, Optics Education and Outreach II, SPIE Optics-Photonics, San Diego, August 12, 2012.
333. C. Walker, **S. M. Pompea**, and R. Sparks, "The Development of an Innovative Ecophotonics/Illumination Engineering Education Program for Grades 5-12," Optics Education and Outreach II, SPIE Optics-Photonics, San Diego, August 12, 2012.

334. **S. M. Pompea**, R. Sparks, and C. Walker, "Optics education through the Arizona Galileoscope Program," Optics Education and Outreach II, SPIE Optics-Photonics, San Diego, August 12, 2012.
335. **S. M. Pompea**, "Effective Partnerships for Outreach," SPIE Optics-Photonics Student Chapters Meeting, San Diego, August 12, 2012 (Invited)
336. M. A. Newhouse; C. E. Walker; S. K. Boss; A. J. Hennig, and **S. M. Pompea**, "Mobilizing the GLOBE at Night Citizen-Scientist," American Geophysical Union, San Francisco, December 3, 2012.
337. C. E. Walker, L. Jensen, and **S. M. Pompea**, "Measuring and Characterizing Sky Brightness over the Nighttime in Tucson and Surrounding Observatory Mountaintops," American Geophysical Union, San Francisco December 6, 2012 (Poster)
338. **S. M. Pompea** and B. Delp, "Astronomical Implications from an Analysis of the Spectra of LEDs Used in Street Lighting," American Astronomical Society, Long Beach, CA, January 7, 2013. (Poster)
339. **S. M. Pompea**, R.T. Sparks, C. Dugan, and C.E. Walker, "Lessons Learned from the Arizona Galileoscope Star Party Program," American Astronomical Society, Long Beach, CA, January 8, 2013.
340. **S. M. Pompea**, R.T. Fienberg, D.N. Arion, and R.T. Sparks, "Reflections on the IYA 2009 Galileoscope Project," American Astronomical Society, Long Beach, CA, January 7, 2013. (Poster)
341. R. T. Sparks, C.D. Garmany, **S.M. Pompea**, and C.E. Walker, "An Extended Day Program on the Tohono O'odham Nation," American Astronomical Society, Long Beach, CA, January 8, 2013.
342. C. E. Walker, **S.M. Pompea**, and R.T. Sparks, "A Comprehensive Approach to Dark Skies Research and Education at NOAO," American Astronomical Society, Long Beach, CA, January 9, 2013.
343. **S. M. Pompea**, "Teacher-Scientist Partnerships in Astronomy," International Teacher-Scientist Partnership Conference, American Association for the Advancement of Science, Boston MA February 13-14, 2013. (Presentation and Panel Moderator)
344. **S. M. Pompea**, "Models for Teacher-Scientist Research Partnerships at the National Optical Astronomy Observatory," International Teacher-Scientist Partnership Conference, American Association for the Advancement of Science, Boston MA February 15, 2013. (Poster)

345. C. E. Walker, D. C. Tellez, and **S. M. Pompea**, "Communicating Dark Skies Outreach with Educators and Students in Africa," Communicating Astronomy with the Public conference, Warsaw, Poland, October, 2013.
346. C. E. Walker, W. T. Roddy, C. Dugan, M. Newhouse, and **S. M. Pompea**, "Communicating Dark Skies/Energy Education with Middle School Teachers and Students," Communicating Astronomy with the Public conference, Warsaw, Poland, October, 2013 (Poster)
347. D. C. Tellez, C. E. Walker, and **S. M. Pompea**, "Dark Skies Outreach to Sub-Saharan Africa," International Dark Sky Association, AGM Fall 2013, Tucson, AZ, Nov.10-11, 2013 (Poster)
348. W. T. Roddy, C. E. Walker, C. Dugan, M. Newhouse and **S. M. Pompea**, "Communicating Dark Skies/Energy Education with Middle School Teachers and Students," International Dark Sky Association, AGM Fall 2013, Tucson, AZ, Nov.10-11, 2013 (Poster)
349. C. E. Walker and **S. M. Pompea**, "The International Globe at Night Citizen-Science Campaign: Shedding Light on Light Pollution," Abstract ED51A-0586 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec. 2013.
350. C. E. Walker, C. Dugan, M. Newhouse, W. T. Roddy and **S. M. Pompea**, "Tales from the Dark Side: Teacher Professional Development, Support, Activities, Student Research & Presentations," American Geophysical Union, San Francisco December 9-13, 2013.
351. J. Chmielewski and **S. M. Pompea**, "Spectral and Illuminance Assessment of Tucson, Arizona Light Pollution Hot Spots," American Astronomical Society, Washington DC, January 8, 2014 (Poster)
352. **S. M. Pompea**, C. E. Walker, C. Dugan, W. T. Roddy, and M. Newhouse, "Dark Skies Yuma: An NOAO and APS Program on Light Pollution Education" American Astronomical Society, Washington DC, January 9, 2014.
353. C. E. Walker, D. Tellez, **S. M. Pompea**, "Dark Skies Africa: an NOAO and IAU OAD Program on Light Pollution," American Astronomical Society, Washington DC, January 9, 2014.
354. C. Tzou, L. Conner, **S. Pompea**, and M. Guthrie, "Colors of Nature: Connecting Evolutionary Biology, Optical Science, and Arts Education to Promote STEM-related Identity Work in Middle School Girls," National Association for Research in Science Teaching, Pittsburgh, PA, April 1, 2014.
355. C. Walker, L. Shore, **S. M. Pompea**, S. Mitchell, R. Green, S. Eyermann, G. Brissenden, and D. Arion "Synergy between the Astronomy Community and Cosmic Light, a Cornerstone for the International Year of Light," Astronomical

- Society of the Pacific Annual Meeting, Burlingame, California August 2-6, 2014. (Special Session Workshop)
356. C. Walker, S. Buxner, D. Mennitt, C. Cooper, S. O'Connor, and **S. M. Pompea**, "Using NGSS to Shape Research Projects with Citizen-Science Data," Astronomical Society of the Pacific Annual Meeting, Burlingame, California August 2-6, 2014. Special Session: Special Interest Group Discussion
 357. **S. M. Pompea**, L. Conner, C. Tzou, M. Guthrie, R. T. Sparks, and C. Kaleida "Colors of Nature" Astronomical Society of the Pacific Annual Meeting, Burlingame, California August 2-6, 2014. (Poster)
 358. G. Squires, J. Brewer, S. Dawson, and **S. Pompea**, "Across the World: A Vision for TMT Workforce Development, Education, Public Outreach, and Communication Astronomical Society of the Pacific Annual Meeting, Burlingame, California August 2-6, 2014. (Talk)
 359. R. T. Sparks, **S. M. Pompea**, and C. E. Walker, "The Arizona Galileoscope Project: A 5th Grade Rural Education Program," American Astronomical Society, Seattle, Washington, January 6, 2015. (Poster)
 360. Z. T. Watson and **S. M. Pompea**, "Exoplanet Research at a Southwestern Urban High School: Lessons Learned from the Tucson High Astronomy Club Research Program, American Astronomical Society, Seattle, Washington, January 6, 2015. (Poster)
 361. C. T. Tzou, L. Conner, **S. Pompea**, and M. Guthrie, "Colors of Nature: Connecting Evolutionary Biology, Optical Science, and Arts Education to Promote STEM-related Identity Work in Middle School Girls," National Association for Research in Science Teaching, Chicago, Illinois, April 11-14, 2015.
 362. **S. M. Pompea** and L. D. Carsten-Conner, "Teaching Optics Concepts through an Approach that Emphasizes the Colors of Nature," International Conference on Education and Training in Optics and Photonics, Bordeaux, France, July 2015 (Invited Plenary).
 363. R. T. Fienberg, D. N. Arion, **S. M. Pompea**, and R. T. Sparks, "The Galileoscope: From IYA 2009 to IYL 2015 & Beyond," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
 364. G. Squires, J. Brewer, S. Dawson, and **S. M. Pompea**, "TMT: An International Plan for Workforce, Education, Public Outreach and Communications," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
 365. R. T. Sparks, **S. M. Pompea**, J. C. Seguel, D. A. Munizaga, L. Opazo, C. E. Walker, R. T. Fienberg; D. N. Arion, "Using the Galileoscope in Public Outreach

- Programs in the United States and Chile," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
366. R. T. Sparks, C.E. Walker, **S. M. Pompea**, "Social Media Programs at the National Optical Astronomy," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015. (Poster)
367. C. E. Walker, **S.M. Pompea**, R. T. Sparks, "Globe at Night: From IYA2009 to the International Year of Light 2015 and Beyond," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
368. C. E. Walker, D. Tellez, **S. M. Pompea**, "Dark Skies Africa: a Prototype Project with the IAU Office of Astronomy for Development," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
369. C. E. Walker, **S. M. Pompea**, R. Levy, "The Quality Lighting Teaching Kit: Educating the Public about the Dark Side of IYL2015," 29th General Assembly of the International Astronomical Union, Honolulu, Hawaii, August 1-14, 2015.
370. **S. M. Pompea**, "Exemplary Science Programs (ESP) Meeting Current Reform Efforts," National Science Teachers Association Conference on Science Education, Nashville, March 31, 2016. (Presentations and Panel)
371. C. Tzou, C., B. Tsurusaki, L. Conner, M. Guthrie, and **S. M. Pompea**, "Colors of Nature: Arts as authoring and identity pathway in science learning." In A. C. Barton (organizer), "Equity and access in science: Understanding pathways frameworks for youth learning and development". Annual meeting of the American Educational Research Association (AERA), Washington, DC April 8-12, 2016. (Poster)
372. **S. M. Pompea**, "Knowledge and Wonder: Reflections on Ill-Structured Problem Solving," Robert A. Millikan Medal Talk, American Association of Physics Teachers, Sacramento, July 19, 2016.
373. C. E. Walker and **S. M. Pompea**, "The Quality Lighting Teaching Kit: Enlightening Our Future," SPIE Conference on Optics Education and Outreach IV, San Diego, CA, August, 2016.
374. **S. M. Pompea** and N. Regens, "Teaching Space Awareness Using a Visual Thinking Strategy (VTS), ESA/GTTO/Space Awareness International Workshop 2016, University of Leiden, October 21, 2016. (Invited)
375. C. E. Walker, M. Newhouse, and **S. M. Pompea**, "Minimizing the Threat of Light Pollution on Observatories through Education: Globe at Night Citizen-Science, American Astronomical Society, Jan. 2017. (Poster)

376. C. E. Walker, E. Kisiel and **S. M. Pompea**, "Teen Astronomy Cafés: High School Students Experiencing Real Research with Scientists," American Astronomical Society, Jan. 2017. (Poster)
377. C. E. Walker and **S. M. Pompea**, "Minimizing the Threat of Light Pollution on Observatories through Education: The Quality Lighting Teaching Kit," American Astronomical Society, Jan. 2017. (Poster)
378. R. C. Smith, M. Smith, **S. M. Pompea**, P. Sanhueza, and the AURA-Chile EPO Team, "Promoting Dark Sky Protection in Chile: The Gabriel Mistral IDA Dark Sky Sanctuary and Other AURA Initiatives," American Astronomical Society, Jan. 2017. (Poster)
379. **S. M. Pompea**, Colloquium, Kapteyn Astronomical Institute, University of Groningen, "Approaches to Problem Solving in Astronomy Education," February 6, 2017.
380. **S. M. Pompea**, Colloquium, Department of Astrophysics, Radboud Universiteit, Nijmegen, "Solving the Hard Problems in Astronomy Education" February 14, 2017.
381. **S. M. Pompea**, Colloquium, The Instituto de Astrofísica e Ciências do Espaço (Oporto and Lisbon, Portugal), "Experiments in Public Engagement and Education at the U.S. National Optical Astronomy Observatory," February 23, 2107.
382. **S. M. Pompea**, Colloquium, Anton Pannekoek Institute for Astronomy, University of Amsterdam, "Effective Astronomy Public Engagement and Communication," March 15, 2017.
383. B. K. Tsurusaki, C. Tzou, L. D. Carsten Conner, M. Guthrie, and **S. Pompea**, Colors of Nature: Art/Science Agency in Intersecting Figured Worlds. San Antonio, TX: National Association of Research in Science Teaching Annual International Conference 2017.
384. **S. M. Pompea**, "Best Practices in Science Education Projects for Native American Communities," Dutch National Science Communication Conference, Den Hague, April 10, 2017.
385. **S. M. Pompea**, Panel: "Role of Science Communication in Societal Challenges: International Perspectives," Dutch National Science Communication Conference, Den Hague, April 10, 2017.
386. **S. M. Pompea**, "Astronomy Public Engagement: Six Essential, But Not Easy Lessons," University of Leiden Astronomy Department, May 4, 2017.
387. **S. M. Pompea**, "Six Easy Lessons on the Art of Public Engagement in Astronomy," Cumbre Chilena-Estadounidense de Difusión de la Educación en

- Astronomía Chile (U.S. Astronomy Education Outreach Summit in Chile), Santiago, Chile, August 10, 2017.
388. **S. M. Pompea**, L. Opazo, and W. Buckingham, "Strategies for Increasing Visitation to Professional Observatories at NOAO in Chile and the United States," Astronomy Museums, Visitor Centres & Public Observatories Workshop, Leiden University, September 28, 2017, Leiden, The Netherlands.
 389. **S. M. Pompea**, L. Opazo, J. Seguel, and D. Munizaga, "Chile 2019 Educational Eclipse Preparations at Cerro Tololo Inter-American Observatory," Astronomical Society of the Pacific Annual Meeting, St. Louis, December 5-7, 2017. (Poster)
 390. C. E. Walker, M. Newhouse, L. Opazo, J. Seguel, and **S. M. Pompea**, "Citizen Scientists Measure Sky Darkness During the 2019 Total Solar Eclipse," Astronomical Society of the Pacific Annual Meeting, St. Louis, December 5-7, 2017. (Poster)
 391. R. T. Sparks and **S. M. Pompea**, "National Observatory Programs with the Tohono O'odham Nation," Astronomical Society of the Pacific Annual Meeting, St. Louis, December 5-7, 2017. (Poster)
 392. C.E. Walker and **S. M. Pompea**, "Globe at Night Citizen Science: Reaching for the Stars" in New Approaches to Citizen Science: Intersection of Outreach, Crowd-Sourced Data, and Scientific Research, American Geophysical Society, New Orleans Dec. 11-15, 2017.
 393. R. Chris Smith, M. Smith, **S. M. Pompea**, and P. Sanhueza, "Promoting Dark Sky Protection in Chile: the Gabriela Mistral IDA Dark Sky Sanctuary and Other AURA Initiatives, American Astronomical Society, National Harbor, January 9, 2018 (Poster).
 394. **S. M. Pompea** and C. E. Walker, ""Big Data" Teen Astronomy Cafes at NOAO," American Astronomical Society, National Harbor, January 10, 2018 (Poster).
 395. **S. M. Pompea**, R. T. Fienberg, D. N. Arion, and R. T. Sparks, "Astronomy Best Practices in Using Galileoscopes to Foster Science Interest," Communicating Astronomy with the Public 2018, Fukuoka Japan, March 24-28, 2018.
 396. **S. M. Pompea** and N. L. Regens, "Encouraging Diversity Through Art-Based Approaches to Astronomy," Communicating Astronomy with the Public 2018, Fukuoka Japan, March 24-28, 2018 (2 Workshops).
 397. **S. M. Pompea** and C. E. Walker, "Astronomy Communication for a Better World: Globe at Night," Communicating Astronomy with the Public 2018, Fukuoka Japan, March 24-28, 2018 (Poster).

398. R. N. Pfisterer, **S. M. Pompea**, and S. Ellis, "Recent Advances in Stray Light Modeling for Large Telescope/Observatory Systems," SPIE Astronomical Telescopes + Instrumentation, Austin, Texas, June 10-15, 2018 (Poster).
399. C. E. Walker and **S. M. Pompea**, "Globe at Night: Citizen-Science Assessing the Darkness of our Skies," IAU General Assembly 2018 Focus Meeting 14 (FM14), Vienna, Austria, August 23, 2018.
400. C. E. Walker and **S. M. Pompea**, "Cultivating Talented Youth with Big Data Teen Astronomy Cafes," IAU General Assembly 2018, Vienna, Austria, August 23, 2018.
401. C. E. Walker and **S. M. Pompea**, "The Quality Lighting Teaching Kit: Utilizing Problem-Based Learning in Classrooms," IAU General Assembly 2018, Vienna, Austria, August 23, 2018.
402. T. Spuck, C. Blue, V. Fonca, S. Lifson, P. Michaud, and **S. Pompea**, "Astronomy in Chile Educator Ambassadors Program ACEAP, American Astronomical Society, Seattle, Washington, January 8, 2019. (Poster)
403. **S. M. Pompea**, "Einstein Schools: Design of an Educational Program to Celebrate 100 Years of General Relativity," Instituto De Astrofísica E Ciências Do Espaço (Ia), Lisbon, March 29, 2019.
404. N. L. Regens and **S. M. Pompea**, "What Can Art Teach Us About Science?" Lisbon Planetarium, March 30, 2019. (Workshop)
405. **S. M. Pompea**, "Astronomy Public Engagement," Illuminating Education: International Day of Light Symposium, International Center for Theoretical Physics, Trieste, Italy, May 16, 2019. (Invited Talk)
406. **S. M. Pompea** and N. L. Regens, "Visual Thinking Strategy Approaches to Teach Science," Astronomy Education: Bridging Research and Practices, Garching, Germany, September 17, 2019 (Workshop).
407. **S. M. Pompea**, I. Nijman, M. Newhouse, J. Rose, C. Pantojo, and J. Rivero Gonzalez, "The Einstein Schools Programme: A Project-Based Approach to Encourage Worldwide School Collaboration," Astronomy Education: Bridging Research and Practices, Garching, Germany, September 17, 2019.
408. **S. M. Pompea**, L.D. Carsten Conner, B.K. Tsurusaki, C. Tzou, M. Guthrie, and P. Teal-Sullivan, "Developing a STEAM Mindset in Astronomy Education," Astronomy Education: Bridging Research and Practices, Garching, Germany, September 17, 2019.

409. **S. M. Pompea**, "The Value to Astronomy Education of the Einstein Schools Programme Model," 1st Shaw-IAU Workshop on "Astronomy for Education," Institut d'Astrophysique de Paris, December 18, 2019 (Invited).
410. R. T. Sparks, **S. M. Pompea**, and C. Pantoja, "Einstein Schools," American Association of Physics Teachers, January 18-21, 2020, Orlando Florida (Poster).
411. R. T. Sparks, C. E. Walker, and **S. M. Pompea**, The Teen Astronomy Café Program, American Association of Physics Teachers, January 18-21, 2020, Orlando Florida (Poster).
412. **S. M. Pompea**, C. Pantoja, I. Nijman, J. Rose, M. Newhouse, and J. Rivero, "International School Collaborations through the IAU Einstein Schools Programme," American Astronomical Society, Honolulu, Hawai'i January 6, 2020.
413. L. Conner, C. Tzou, B. Tsurusaki, P. Teal-Sullivan, M. Guthrie, and **S. Pompea**, "Fostering STEAM: An Equity and Mindset-Based Approach to Supporting Educators," AGU, Dec. 2020.
414. P. Russo, **S. M. Pompea**, C. Pantoja, J. Rivero, and D. Pitts, "How Can We Keep Good Educational Projects Alive?" Workshop, Astronomical Society of the Pacific Annual Meeting, December 4, 2020.
415. **S. M. Pompea** and P. Russo, "Engaging More Effectively with the Educational Ecosystem," Astronomical Society of the Pacific Annual Meeting, December 5, 2020.
416. R. Sparks, J. Seguel, and **S.M. Pompea**, "A Modern Version of the Eddington Experiment," Astronomical Society of the Pacific Annual Meeting, November 18, 2021.
417. P. Russo and **S.M. Pompea**, "Improving Astronomy Education: It's Not Rocket Science—It's Harder!" Astronomical Society of the Pacific Annual Meeting, November 18, 2021. (Invited Plenary Talk)
418. **S. M. Pompea**, "Community Partnerships for Dark Skies Energy Awareness," in *Shared Goals through Community Partnerships*, Ecsite 2022, Heilbronn Germany, June 4, 2021 (Invited Workshop).
419. **S. M. Pompea**, "Fostering Educational Stewardship," National Science Teaching Association Podcast, *Lab Out Loud*, May 2022.
<https://laboutloud.com/2022/05/episode-267-fostering-educational-stewardship/>

420. **S. M. Pompea**, "Best Practices to Achieve Multiple Outreach Goals"
"Communicating Astronomy to the Public 2022," MacQuarie University, Sydney
Australia, September 13, 2022 (Virtual Attendance).
421. J. Goldhill, C. Mealing-Jones and **S. M. Pompea**, "Dark Skies," Hay Winter
Festival, Hay-on-Wye, Wales, United Kingdom, November 24, 2023 (invited
panel discussion member).
422. J. Retrê, **S.M. Pompea**, P. Russo, S. Pereira, "Communicating Directly with
National Governments: A Strategic and Tactical Plan Using Star Parties," *CAP
2024, Communicating Astronomy to the Public*, Toulouse, France, June 26,
2024.
423. **S.M. Pompea**, N.L. Regens, P. Russo, "A New Approach to Building and
Forging Equity in Science Education," *ASP2024 Astronomy Across the
Spectrum*, Astronomical Society of the Pacific, August 22, 2024.
424. **S. M. Pompea**, Photography Exhibition by Judy Goldhill, "Dark Skies,"
Ballroom Gallery, Aldeburgh, Suffolk, United Kingdom, September 14, 2024
(invited talk at exhibit opening).

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