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Education and Professional Affiliation

MIT

B.S. Earth and Planetary Sciences, 1978

Harvard University

M.S., Ph.D. Astronomy, 1987

Member: American Astronomical Society (AAS),
Society of Photo-Optical Instrumentation Engineers (SPIE);

Citizenship:US

Roles

Leading Scientist on Space Observing Technology & Missions, 2003-present

Smithsonian Astrophysical Observatory (SAO) Science Lead for the International X-Ray Observatory (IXO), \$3 billion proposal for joint NASA/ESA flagship mission.
Principal Investigator for the Extreme Physics Explorer, \$780 million NASA concept.

Chandra Mission Planning Scientist, 1994-2003

Development, specifications, pseudo-code and testing of Star Selection Algorithm (SSA) for determining accurate spacecraft pointing position. Development of guide star catalog.
Specification and testing of mission planning software for efficient observational sequence and spacecraft load generation.

Einstein Observatory Project Scientist, 1991-1994

Supervised 20+ scientists/engineers/technicians and \$2 million/year budget. Main tasks included production and distribution of CDROMs containing Einstein High Resolution Imager and Imaging Proportional Counter Slew Survey data, including software and documentation for its analysis. Design and development of network based systems to distribute all Einstein data.

Chandra High Resolution Camera Mission Scientist, 1987-1991

Designed, carried out, and published experiments on micro-channel plate imagers; including acquisition and testing of new micro-channel plates, optimization of instrumental sensitivity and modeling/measuring of background. Design and testing of the ROSAT High Resolution Imager, concentrating on the UV/Ion shield and analysis of in-flight calibration data.

Principal Investigator on over \$1.7M in research grants from NASA, SI, & NSF, 1987-present

Wrote, acquired, managed, & completed grant-funded research in astrophysics. Many programs dealt with source detection at low signal/noise levels in the X-ray, UV, IR, and Radio bands. Included use of time series analysis, survival analysis, maximum likelihood estimators.

Project and Systems Architect, 1991-present

Science Requirements (Level 0, 1, 2) and documents for new missions (IXO).
Pseudo-code and prototyping for operations software (Chandra).

Leading Advocate for cornerstone missions at SAO, 2003-present

Pitched projects to lead universities and NASA headquarters.

Founder and Lead Scientist for International Student Astrophysics Exchange, 2005-present

Southampton University/SAO Master in Astrophysics with a Year Abroad.

Energetic X-ray Imaging Telescope Experiment, NASA Balloon Mission, 1982-1987

Tasks included basic design and testing of imager and telescope, predictions of performance, calibration of PSF of X-ray imager; writing Monte-Carlo simulation to model performance of CsI scintillator; writing image capture/display and multi-channel analysis software for resistive anode readout.

Positions

Astrophysicist, Smithsonian Astrophysical Observatory (SAO), 1987-present

Supporting Skills

Modeling, analysis, and simulation of image, timing, and spectroscopic datasets; statistical tests

Experiment design, execution, completion, and documentation

Space mission design and optimization, studies of mission trade space

Proposal Preparation, including science, technologies, and budgets to NASA and Smithsonian

X-ray detector and optics design and development

Strong presentation skills: over 400 professional publications, numerous talks/presentations, press releases, TV shows, Smithsonian Museum Traveling Exhibits.

Mentoring: 6 post-docs, 6 Masters Astrophysics students

Leadership: Chair SAO Scientists Council, chair Science Organizing Committees for science

conferences, publications editor, scientific publications referee, NASA/NSF/SI proposal reviewer

Fluent with Fortran, UNIX, Windows, S-Plus/R, Knowledge of IDL, MATLAB