

Ori D. Fox

CONTACT INFORMATION

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RESEARCH INTERESTS

Supernovae, Dust, Stellar Evolution, Infrared Instrumentation, Detector Development,
Cosmology, Infrared Data Collection and Analysis

EDUCATION

The University of Virginia, Charlottesville, Virginia USA

Ph.D., Astronomy (expected graduation date: May 2010)

- Thesis Topic: A Near-Infrared Study On The Role Of Dust In Supernovae
- Advisor: Professor Michael Skrutskie
- NASA GSRP Advisor: Bernie Rauscher (Infrared Detectors)

M.S., Astronomy, May 2004

- GPA 3.54/4.0

Boston University, Honors Program, Boston, Massachusetts USA

B.S., Astronomy and Astrophysics, May 2003

- GPA: 3.83/4.0
- Independent Research: Kinematic Distance Ambiguity in the Milky Way Galaxy
- Advisor: Thomas Bania

AWARDS

Virginia Space Grant Consortium Fellowship, 2009-2010
NASA Student Ambassador, 2009-2010
NASA's Graduate Student Research Program, 2006-2009
Achievement Reward for College Scientists (ARCS), 2006-2007
Phi Beta Kappa (Early Induction), 2002
NASA's Undergraduate Student Research Program, 2001

PROFESSIONAL/ RESEARCH EXPERIENCE

Department of Astronomy, The University of Virginia, Charlottesville, Virginia

<http://www.astro.virginia.edu/research/instrumentation/>

Research Assistant

June 2004 to present

(This job is split part-time with the NASA Goddard research described below.)

- Observe, Reduce, and Analyze photometric and spectroscopic supernova data
- Hire and Train a team of 10 undergraduates to implement our supernova survey at a local, 31-inch hand equipped infrared telescope
- Construct and Execute experiments to characterize infrared detectors
- Design and Commission instruments, specifically a custom Geneva gear slit exchange mechanism for the TripleSpec spectrograph, a permanent instrument at Apache Point Observatory, NM that we built at the University of Virginia and now provides data for my thesis

Detector Characterization Laboratory, NASA Goddard Space Flight Center,
Greenbelt, MD

<http://dcl.gsfc.nasa.gov/>

Graduate Student Research Fellow **September 2006 to Present**
(This job is split part-time with the UVa Research Assistant job described above.)

- Characterize near-infrared detectors, as well as state-of-the-art SIDECAR (system image, digitizing, enhancing, controlling, and retrieving) ASICs (Application Specific Integrated Circuits), for the upcoming James Webb Space Telescope Near-Infrared Spectrograph
- Calibrate and reduce effects of non-ideal detector behavior
- Present results at NASA international workshops and meetings

MIT Lincoln Laboratories, Lexington, MA

Assistant Staff in Radar Intelligence, Test, and Evaluation Group
September 2003 to September 2004 (Full Time)

- Coordinated radar performance for target detection and tracking mission
- Independently developed radar search algorithms to maximize performance

Boston University, Boston, MA

Undergraduate Research Assistant **September 2002 to May 2003**

- Remotely collected data to map the Milky Way Galactic Ring in ^{13}CO with the FCRAO 14-m radio telescope
- Analyzed solutions to resolve the galaxy's kinematic distance ambiguity

NASA Jet Propulsion Laboratory, Pasadena, CA

Undergraduate Fellowship with the Planetary Sciences Division **Summer 2002**

- Characterized Jupiter's atmosphere at different pressures, determining a cold hole exists at the pole due to turbulent wind patterns

TEACHING
EXPERIENCE

The University of Virginia, Charlottesville, Virginia USA

Teaching Assistant (10 hours per week) **September 2004 to May 2006**

- TA for ASTR 121 (Intro to Sky and Solar System), ASTR 124 (Intro to Stars, Galaxies, and the Universe), ASTR 130 (Intro to Astronomical Observation), and ASTR 511 (Astronomical Techniques)

• *PI for Supernova Survey (10 hours per week)* **September 2006 to Present**

- Trained 10 undergraduate students with telescope hardware and software
- Taught undergraduates data reduction techniques
- Mentored undergraduates as they progressed through their research, which resulted in a published paper of which the entire team was a part

WORKSHOPS
ATTENDED

- Detectors for Astronomy, *ESO*, Garching, Germany, Oct 12-16, 2009.
- Stellar Death and Supernovae Conference, *KITP*, UCSB, Santa Barbara, CA, Aug 17-21, 2009.
- RogerFest: Celebrating the Contributions and Accomplishments of Roger Chevalier, *CalTech*, Pasadena, CA, Aug 21-23, 2009.
- NASA GSRP Symposium, *NASA Goddard*, Greenbelt, MD, Sep 24-26, 2008.
- SNAP Collaboration Meeting, *FermiLab*, Batavia, IL, May 15-17, 2008.
- NASA GSRP Symposium, *NASA Goddard*, Greenbelt, MD, Sep 19-21, 2007.
- JWST Partners Workshop, *Royal Kilmainham*, Dublin, Ireland, Jun 11-14, 2007.
- SNAP Collaboration Meeting, *IAP*, Paris, France, Oct 11-13, 2007.
- NASA GSRP Symposium, *NASA Goddard*, Greenbelt, MD, Sep 18-22, 2006.
- JWST Partners Workshop, *Northrop Grumman Space Technology*, Redondo Beach, CA, Nov 28-30, 2006.

Refereed Supernova Publications

1. * **Fox, O.**, Skrutskie, M. F., Chevalier, R. A., et al., 2009, "Near-Infrared Photometry of the Type II In SN 2005ip: The Case for Dust Condensation," *ApJ*, 691, 650.
2. Soderberg, A. M., Chakraborti, S., Pignata, G., Chevalier, R. A., Chandra, P., Ray, A. Wieringa, M. H., Copete, A., Chaplin, V., Connaughton, V., Barthelmy, S. D., Bietenholz, M. F., Chugai, N., Stritzinger, M. D., Hamuy, M., Fransson, C., **Fox, O.**, Levesque, E. M., Grindlay, J. E., Challis, P., Foley, R. J., Kirshner, R. P., Milne, P. A., Torres, M. A. P., 2009, "Discovery of a Relativistic Supernova Without a Gamma-ray Trigger," Submitted to *Nature*, arXiv:0908.2817.
3. Levesque, E. M., Soderberg, A. M., Foley, R. J., Berger, E., Kewley, L. J., Chakraborti, S., Ray, A., Torres, M. A. P., Challis, P., Kirshner, R. P., Barthelmy, S. D., Bietenholz, M. F., Chandra, P., Chaplin, V., Chevalier, R. A., Chugai, N., Connaughton, V., Copete, A., **Fox, O.**, Fransson, C., Grindlay, J. E., Hamuy, M. A., Milne, P. A., Pignata, G., Stritzinger, M. D., Wieringa, M. H., 2009, "The High-Metallicity Explosion Environment of the Relativistic Supernova 2009bb," Submitted to *ApJ*, arXiv:0908.2818.
4. * **Fox, O.**, Skrutskie, M. F., Chevalier, R. A., "Late-Time *Spitzer* Spectroscopy of the Type II In SN 2005ip," In Prep.

Refereed Detector Publications

1. * **Fox, O.**, Waczynski, A., Wen, Y., Foltz, R. D., Hill, R. J., Kimble, R. A., Malumuth, E., and Rauscher, B. J., 2009, "The ^{55}Fe X-ray Energy Response of Mercury Cadmium Telluride Near-Infrared Detector Arrays." *PASP*, 121, 743.
2. * Rauscher, B. J., **Fox, O.**, et al., 2007, "Detectors for the James Webb Space Telescope Near-Infrared Spectrograph." *PASP*, 119, 768R.

Selected Conference Proceeding Publications

1. **Fox, O.**, Waczynski, A., Wen, Y., Foltz, R. D., Hill, R. J., Kimble, R. A., Malumuth, E., and Rauscher, B. J., 2008, "The ^{55}Fe X-ray Energy Response of Mercury Cadmium Telluride Near-Infrared Detector Arrays." *Proc. of SPIE*, 7021, 702123.
2. Mott, D.B., et al., 2007, "Characterization of the Detector Subsystem for Near Infrared Spectrograph on the JWST." *Proc. of SPIE*, 6690E, 18M.
3. Nelson, M., et al., 2006, "Development of Extended Wavelength Response InGaAs Detectors for Astronomical Applications." *Proc. of SPIE*, 6276, 62761R.

Selected Posters

1. **Fox, O.**, Skrutskie, M., Chevalier, R., "Three Years of SN 2005ip in the IR: The Case for Dust Condensation." Poster at AAS Meeting #213, #490.02; Long Beach, CA, 2009.
2. **Fox, O.**, et al. 2008, "The ^{55}Fe X-ray Energy Response of Mercury Cadmium Telluride Near-Infrared Detector Arrays." Poster Presented at SPIE Astronomical Instrumentation, Marseille, France, 2008.
3. **Fox, O.**, Rauscher, B.J., et al. 2006, "JWST H2RG SCA Reset Anomaly and Random Telegraph Noise", Poster at JWST Partners Workshop, NGST, Redondo Beach, CA.
4. Shah, R.Y., et al. 2002, "The BU-FCRAO Milky Way Galactic Ring Survey", AAS Meeting #201, #112.22; BAAS, 34, 1283

Awarded Proposals and Grants

1. **Fox, O.**, Skrutskie, M., Chevalier, R., "A Survey for Dust in Type II In Supernovae." *Spitzer* #60122, 22.4 hours, 2009.
2. **Fox, O.**, Skrutskie, M., Chevalier, R., "Late time IR emission from an extremely luminous Type II In supernova: SN 2005ip." *Spitzer* #50256, 2.9 hours, 2008.
3. Skrutskie, M., **Fox, O.**, "Infrared Detection And Spectroscopy Of Embedded Supernovae In Actively Star Forming Galaxies." *NSF*, AST-0607737, 2 years, 2006.

*Presented professional talks on these subjects at more than 6 meetings or colloquia external to UVA.

TECHNICAL
SKILLSET

Extensive experience in telescope operations, laboratory systems, and software.

Languages: IDL, IRAF, MATLAB, C++, Fortran, UNIX shell scripting

Software: ds9, XEPHEM, LabView, Zemax optical design, Mechanical Desktop

PUBLIC OUT-
REACH/TALKS/
OTHER

- Peer-reviewed papers for both ApJ and the *Spitzer* TAC.
- Member of the NASA Goddard Public Outreach Group; Various outreach activities include guided tours, visitor's center discussions, and educational activities, including the *Worlds Beyond Project*
- Lobby during congressional visits organized by professional groups, such as AAS.
- Tour guide at UVA observatory's open night programs once a semester
- Lead various educational activities each semester at middle-schools and summer camps
- Organized undergraduates to found the UVA Astronomy Club