

Matthew Barczys

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NOTE: certain information (contact, names, institutions, locations, etc.) has been intentionally omitted from this online/public resume. Please contact me (via email) for a complete version. Thank you.

Systems and Project Engineering Qualifications

- Systems Engineering:** Developed project requirements based on customer specifications, scientific objectives, external interfaces, budget constraints, and schedule demands. Modeled and analyzed designs to verify requirement compliance. Established plans for fabrication, integration, testing, and operations. Provided comprehensive recommendations to customers and management for decisions.
- Project Engineering:** Experience cooperating with engineers and subcontractors, evaluating and reviewing designs, overcoming design obstacles, ensuring feasibility, prioritizing critical tasks, and tracking schedule progress. Produced detailed optical, mechanical, electrical, and software designs to support projects.
- Testing:** Coordinated testing of prototype mechanisms and electronic subsystems in vacuum and cryogenic test chambers. Formulated comprehensive test plans for overall systems, individual components, and software. Analyzed and presented test data for test reports and design reviews.
- Troubleshooting:** Analyzed system failures and associated risk in operational hardware using test software, test equipment, and simulations. Designed and implemented modifications to electrical, mechanical, optical, and software systems to improve reliability, performance, and safety. Led field-service teams.
- Operations Support:** Provided real-time support and problem resolution during night observing for scientific programs involving time-critical events. Trained staff for future support of instruments and systems.
- Imaging Devices:** Developed and operated systems using infrared FPAs and CCDs; proficient with associated readout electronics, analog noise reduction, ESD prevention, vacuum/cryogenic techniques, and data analysis.
- Optical Systems:** Created, analyzed, integrated, and tested unique optical designs utilizing interference filters, lenslet arrays, diffractive optics, fiber optics, active optics, and adaptive optics.
- Communication:** Wrote and delivered presentations for design reviews, team meetings, conferences, customer training seminars, laboratory tours, public lectures, and classrooms. Produced and reviewed technical notes, user manuals, troubleshooting procedures, project reports, and articles.

Technical Studies

<i>Ph.D., Astronomy</i>	<i>March 2007</i>
<i>M.S., Astronomy</i>	<i>June 2001</i>
<i>B.S., Physics and Astronomy, Cum Laude</i>	<i>May 1999</i>

Professional Project Management and Research Experience

Graduate Student Researcher *July 1999 – June 2006*

- Focused on astronomical instrumentation.
- Major project was an adaptive optics optimized, near-infrared, integral-field spectrograph. Participated in all phases (concept, design, fabrication, integration, testing, installation, and operations) and all areas (optics, mechanics, electronics, software, subcontracts, and management) of project.
- Performed largest adaptive optics imaging survey of field galaxies to date (~700 objects, ~20 arcmin²), in order to characterize galaxy mergers for galaxies like the Milky Way. Wrote custom processing and analysis software in IDL, currently used by collaborators.
- Presented talks and posters at professional meetings.

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Undergraduate Research Assistant

May 1997 – May 1999

- Assisted with laboratory and observational testing of near-infrared FPAs developed for the Spitzer Space Telescope.
- Analyzed near-infrared imagery of Comet Hale-Bopp and star-formation regions.

Selected Teaching and Outreach Experience

Orientation Designer and Instructor

Summer 2002 and Summer 2003

- Designed and taught inaugural week-long, in-residence orientation programs for students in NSF Research Experience for Undergraduates internships.
- Developed and presented lessons on technical material (optics, astronomy, laboratory skills, etc.) needed for internship duties. Utilized contemporary educational techniques, including inquiry-based learning.

Planetarium Coordinator

September 2000 – September 2004

- Scheduled shows, performed equipment maintenance, advertised, and planned show content.

Teaching Assistant Coordinator

September 2000 – June 2001

- Part of a team that taught 10-week long course to prepare incoming graduate students to serve as teaching assistants. Planned and taught part of each weekly class.
- Evaluated and supervised astronomy teaching assistants.

Teaching Assistant

September 1999 – June 2001

- Prepared and presented material for laboratories and discussion sessions for upper-level astrophysics and physics undergraduates. Periodically substitute-taught for instructor and performed grading.
- Performed public planetarium shows and led telescope-viewing sessions.

Computer Experience

Engineering: ZEMAX, AutoCAD, Mechanical Desktop, OrCAD

Programming/debugging: C, C++, Java, CSH scripts, IDL, Fortran, Pascal, RS-232

Web: HTML, CSS, Javascript, SHTML

Productivity: Microsoft Office, Microsoft Project, Adobe Photoshop, Adobe Acrobat

Scientific: IDL, IRAF, Mathcad, Mathematica, LaTeX

Networking: VNC, SSH, VPN, TCP/IP

OS's: Unix/Linux, Windows, Mac OS

Additional Information

- Attended training on ESD (JPL), Optical Design (Zemax Corp.), and Vacuum Practices (Varian, Inc.).
- Familiar with clean room procedures.
- SCUBA certified.
- Have worked in extreme environments (at Mauna Kea Summit for ~6 weeks in 2005).