

# Michelle Darrah Ziegler

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## Summary

- Research scientist with a background in astrophysics, and experience in astronomy, subatomic astrophysics, sensory substitution, dynamic modeling, data analysis, statistical analysis, space related software acquisition processes, research and grant proposals, and UAV control.
- Effective worker able to learn new systems, methods, and fields of science while pursuing graduate degree.
- Capable of working independently or as a productive team member – functioning harmoniously with both peers and superiors.
- Adept at learning new processes, procedures, and software applications.
- Impeccable references and solid reputation.

## Research

- Dynamic modeling of test-and-fix cycles
- Alternative methods of data mining
- Sensory Substitution and augmented cognition
- UAV Control Systems
- Submillimeter telescope calibrations using Quasars
- Time-loss analysis for the SAO-Submillimeter Array
- Light Curves of Dwarf Novae and Eclipsing Binary Star Systems
- Engineering and Manufacturing a Mars Simulation Chamber
- Neutrino Detection
- Data Analysis / Reduction
- Fabrication Skills
- Grant / Proposal Writing
- IRB Processes

## Technical

- Fluent With: Macintosh Operating Systems, Windows, Microsoft Offices, Word Processors, Presentation Programs, Spreadsheet Programs, Internet Software, Vensim, CMAP tools
- Proficient With: Matlab, Simulink, Mathematica, Maxim DL, VI Editing, Linux, C, MathCAD, FileMaker, GIMP, Photo editing programs, Field Spec Pro, RS<sup>3</sup>, LMS, ShapeRecorder, AMI (Adaptive Multiagent Integration software), ExtendSim
- Familiar With: Pearl, IRAF, Mirad, LaTeX, Crystal Ball, DOORS
- BrainPort Operation and Certified Trainer
- Telescope Operation (6" - 1.3 meter – array of eight 6 meter)
- Field Spectrometer Operating
- 3D Motion Capture with Measurand and Shapewrap

## Professional Experience

**PROJECT ASSOCIATE** | October 2011 - present  
**RAND Corporation, Santa Monica, CA**

**MEMBER OF THE TECHNICAL STAFF** | Jul. 2010 – October 2011  
**The Aerospace Corporation, El Segundo, CA**

Member of the technical staff in the Software Acquisitions and Process Department within the Engineering and Technical Group of the Aerospace Corporation supporting mission assurance for national security space.

- Provide statistical analysis of metrics reports provided by contractors with regards to defect analysis.
- Research new methods of data mining in free text fields.
- Develop dynamic models of various aspects of contractor's software development cycle.
- Provide a keen eye for science and grammar for document review prior to publication.
- Develop new in house tools for project schedule prediction.
- Document review for Software acquisition specifications and processes.
- Concept mapping for process analysis on a variety of projects.

**RESEARCH ASSOCIATE** | April 2007 – Jan. 2009  
**Institute of Human and Machine Cognition (IHMC), Pensacola, FL**

Provide research and research support to Dr. Anil Raj in a Pensacola, Florida based think tank.

- Sensory Substitution for Wounded Servicemembers including vision loss substitution and balance substitution
- Development and data analysis of UAV control systems augmented cognition projects, and iLeader gesture recognition for military use.
- Aid development and implementation of technologies that help wounded warfighters regain the abilities to see, hear, or balance lost due to combat.
- Train patients on the Brainport Balance and Vision devices.
- Program new hierarchical control system for UAVs, and analyze the resulting data from participants using the new control system.
- Background and initial research for proposals on a broad range of topics from mild Traumatic Brain Injury, to robotic surgery in space, to brain function modeling, and mitigation of astronaut bone-loss.
- Proposal and grant writing as well publishing results and developments, and assisting in IHMC's collaborative efforts with NASA in the ESMD Blue Sky workshop focusing on the new EVA suit design.

**RESEARCH AND OBSERVING ASSISTANT** | Summer 2006  
**Smithsonian Submillimeter Array (SMA), Hilo, HI**

Research assistant to Dr. Alison Peck and observing assistant to main telescope operator at SMA in Hilo, HI and atop Mauna Kea.

- Developing new method for telescope calibrations using quasars
- Data analysis of quasars for stability and intensity to continue building the database
- Research into the 3c454.3 quasar unprecedented intensity flare
- Statistical analysis of observing time-loss for the array
- Observing assistant at 14,000 ft atop Mauna Kea to run the nightly observing scripts and monitor weather and correct any unforeseen errors or adjust observing cue as needed.

**RESEARCH AND OBSERVING ASSISTANT (INTERNSHIP) | Summer 2005**

***National Science Foundation's Center for Adaptive Optics - Smithsonian Submillimeter Array (SMA), Hilo, HI***

Intern through NFS's CfAO placed as research assistant to Dr. Alison Peck and observing assistant to main telescope operator at SMA in Hilo, HI and atop Mauna Kea.

- Applied Adaptive Optics theory and technique to submillimeter wavelengths, developing a new and more accurate method of array calibration.
- Developed database of quasars potentially suitable for use for calibration
- Began analysis of current quasar data and further observations of potentially suitable quasar data
- Courtesy of CfAO, traveled to Colorado to present results to the Society of Advancement for Chicanos and Native American's in Science (SACNAS) conference, and then to the Washington D.C. to present to the American Astronomical Society.
- Courtesy of the Maui Economic Development Board's Women in Science program, presented research at the yearly convention of Sigma Xi where it received high honors.

**RESEARCH ASSISTANT | Fall 2004**

***ASHRA Neutrino Detection Collaboration, Hilo, HI***

Student research assistant to the All-sky Survey High Resolution Air-shower (ASHRA) detector for the advancement of particle astrophysics in Hilo, HI.

- Research detector location options on the Big Island
- Research Hawaiian history to support an environmental impact report
- Help in fabrication and assembling of detectors
- Help organize and run the Collaboration Symposium

**RESEARCH AND OBSERVING ASSISTANT | Summer 2004**

***Kennedy Space Center Space Life Sciences Lab and University of Central Florida, Kennedy Space Center and Orlando, FL***

Student research and observing assistant to Professor Art Litka at the University of Central Florida in Orlando, Florida and liaison and assistant to Dr Schuerger at the Kennedy Space Center Life Sciences Lab at the Kennedy Space Center.

- Help design and fabricate Martian Atmospheric Simulation Chamber
- In charge of all spectroscopy and research of soil and rock
- Liaison between the Orlando and KSC based teams

**RESEARCH AND TELESCOPE OPERATION | Fall 2003**

***National Optical Astronomy Observatory Kitt Peak, AZ***

Student research and telescope operation of the Kitt Peak MDM 1.3 meter telescope in Arizona.

- Proposal for telescope time
- Telescope operation
- Personal research on dwarf novae and eclipsing binary star systems

**Education**

Master of Science Degree | Astronomy (research)

*James Cook University – (distance) Australia | Feb. 2010 – Current*

Bachelor of Science Degree (with Honors) | Major: Astronomy with a minor in Physics

*University of Hawaii – Hilo, CA | Aug. 2004 – May 2006 – (Dean's List)*

Certificate of Completion | Universe Semester

*Columbia University Biosphere 2 | Aug. 2003 – Dec. 2003*

Bachelor of Science – Course Completion | Major: Environmental Politics with a minor in dance

*Rollins College – Winter Park, FL | Aug. 2002 – May 2004 – (Dean's List)*

**Honors and Awards**

- Challenge coin honor for research assistant wounded warriors (Army Surgeon General)
- Congressional Commendation for Research (Congressman Ed Case, HI)
- Gold Ribbon Award of Excellence and certificate for research presentation (Sigma Xi)
- Hawaii's Rising Stars in Science Research (W. M. Keck Observatory)
- Center for Adaptive Optics Short Course Certificate