

**KELLEHER "KEL" GUERIN**  
Opto-Mechanical Engineer, Graduate Student

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## EDUCATION

**Carnegie Mellon University**, Pittsburgh Pennsylvania  
*Masters of Science and Engineering in Electrical Engineering*  
*Present – Expected Graduation December 2008*  
*Quality Point Average 3.78 (cumulative to date)*  
Activities: *Optics Lead, CMU Lunar X PRIZE Team*

**University of Arizona College of Optical Sciences**, Tucson Arizona  
*Bachelor of Science in Engineering in Optical Engineering*  
*Grade Point Average 3.439 (cumulative)*  
Activities: *Vice-President, Optical Society of America/  
International Society of Optical Engineers, Student Chapter, 2006-2007  
Honors College, Member 2003-2005*

## EXPERIENCE

**Lunar X PRIZE Team, Robotics Institute**, Carnegie Mellon University  
*Optical Engineer, business development, Fall 2007 - Current*  
Work Description: Work with members of the Lunar X Prize team under the direction of Red Whittaker to design, build, test and space qualify a three camera imaging system for a lunar robot. Activities include research, component selection and qualification, reverse engineering of commercial off the shelf hardware, CAD mechanical design, thermal design, optical design and prototyping. Worked with stereo vision algorithms as well as algorithms for object tracking and image stitching.

**NASA Research Grant**, Grant recipient: Rigel Woida, Tucson Arizona  
([http://space.newscientist.com/article.ns?id=dn10573&feedId=online-news\\_rss20](http://space.newscientist.com/article.ns?id=dn10573&feedId=online-news_rss20))  
*Design Consultant for the Project, Fall 2006, Current*  
Work Description: Generated various visualizations and graphics for the project.

**Phoenix Mission Center, Lunar and Planetary Laboratory**, University of Arizona, Tucson, Arizona  
*Optical Design Consultant, Summer 2006, Fall 2006*  
Work Description: Worked with principal investigator on the design and optimization of a diffraction grating spectral expander and wavelength band selector. Used **CodeV** optical ray trace analysis software to model the system and optimize performance. After completion of work, was asked by LPL to return and perform non-sequential ray trace analysis of the system using **ASAP** light analysis software.

**Material Electrochemical Research Corp.**, Tucson, Arizona  
*Independent Design Consultant, December, 2005*  
Work Description: Created graphics and animations for several composite ballistics prototypes, generating photorealistic virtual models for visualization and finite element analysis using *SolidWorks*.

**Advanced Ceramics Research Corp.**, Tucson, Arizona  
*Design Engineer, Summer 2005*  
Work Description: Worked closely with electrical and aeronautical engineers on several Unmanned Aerial Vehicle designs and components. Acquired materials and industrial samples from several companies for use in component prototypes. Created detailed CAD drawings of several primary components in UAVs as well as assisting with the design and implementation of other systems.

**Summer Engineering Academy**, University of Arizona, Tucson Arizona  
*Councilor for student engineering education, Summer 2004*  
Work Description: Worked with and was responsible for several groups of High School students while they attended the University of Arizona Summer Engineering Academy; Instructed students on computer skills regarding the engineering design software **SolidWorks**; Supervised student group activities in a leadership

role, maintaining the safety of the students and assisting with problems, both of a computer nature and otherwise.

## INTERNSHIPS

**Department of Physics**, University of Arizona, Tucson, Arizona  
*Technical Assistant, Dr. William S. Bickel*, School year 2001-2002  
Work Description: Assisted Dr. Bickel in his lab, mainly in the Physics metal shop and Sound Lab constructing parts of various apparatus for experiments.

## DESIGN PROJECT

**Project: Passively Modulating Retroreflectors for Target Differentiation**  
**Position:** Electro-Mechanical Engineer / Computer Analyst  
**Date:** Fall 2006— Spring 2007

## EXPERTISE

Computer Operating Systems: Windows, Mac OS, Linux/UNIX  
Graphics / Development Programs: *Adobe Creative Suite (Photoshop, Illustrator, Flash, Dreamweaver)*, Autodesk Maya,  
Microsoft Office, *Including Microsoft Visio*  
Computer Aided Drafting Programs: Autodesk AutoCAD, DSS SolidWorks 2009/Photoworks  
Visualization and Rendering, COSMOS Analysis Package  
Analysis Programs:  
*CodeV* Optical Ray Trace Design, *ASAP Non Sequential Ray Tracing Analysis*, *MATLAB 2007b*, *LabVIEW*  
Languages: C, C++, JAVA, HTML, MATLAB, Basic  
Extensive Optical Laboratory Skills and Procedures  
Machine Shop Equipment, Mill, Lathe, basic CNC interfacing

## WORKSHOPS

*ASAP*, Fall 2006 Breault Research, Tucson, Arizona

## PUBLICATIONS

**Stabilizing an S-band Antenna for Mobile High Bandwidth Communication From the Moon**  
Accepted Paper, IEEE Aerospace 2009  
**Design of a Stereo Imaging System for the Lunar Environment using Commercial Off-the-Shelf Cameras**  
Accepted Paper, SPIE Space Exploration Technologies II 2009

## HONORS

*Graduate Stipend*, Carnegie Mellon University, Fall 2008  
*Honors College*, University of Arizona Member 2003-2005  
*Full Scholarship Offering*, Johns Hopkins University, 2007

## SERVICE

**Optical Society of America / International Society of Optical Engineers**  
*Vice President, University of Arizona Chapter*  
Actions: Spearheaded the creation and organization of a course in the College of Optical Science specifically dedicated to creating educational awareness of Optics in Tucson, Arizona high schools.  
**College of Optical Sciences**, University of Arizona, Tucson, Arizona  
*Chair, Senior Gift to Optical Sciences – 2007*  
Actions: Created a gift from the Class of 2007 at the College of Optical Sciences to be presented to the college at graduation of the class of 2007.

## INTERESTS

**Augmented Reality, Flexible Displays, Ubiquitous Computing, Robotics, Space Systems**

## REFERENCES

*Any references for the above work experience can be supplied upon request.*