



# Dale E. Karas

## Curriculum Vitae

*U.S. Citizen - DoD-S Security Clearance Obtained  
Available to Relocate*

**Profile:** [CV usage for Nevada STEM Mentor Network]

### Education

- 2015–Present **[In Progress] Doctorate of Philosophy (Ph.D) - Mechanical Engineering**, *The University of Nevada Las Vegas*, Howard R. Hughes College of Engineering, Dept. of Mechanical Engineering, Las Vegas, NV, *GPA – 3.82/4.*  
Graduate Research Certificate in Nuclear Criticality Safety  
Graduate College Research Certification (GCRC)
- 2008–2013 **Bachelor of Science (B.S.) - Optical Science & Engineering**, *The University of Arizona*, College of Optical Sciences & Engineering, Tucson, AZ, *GPA – 3.47/4.*  
Chemical Engineering Minor, Mathematics Minor
- 2008–2013 **Bachelor of Music (B.M.) - Music Composition**, *The University of Arizona*, College of Fine Arts, Dept. of Music, Tucson, AZ, *GPA – 3.51/4.*  
Piano/Organ Performance Emphasis

### Honors & Awards

- 2014,2017 OSA: The Optical Society - Congressional Visits Day (Travel Grant Recipient 2014, promoted support for photonics technologies and R&D to members of Congress)
- 2014 SPIE: The International Society for Optics and Photonics - 2014 Optics Outreach Games, Peoples Choice Award (Rep. UA-OSC Student Optics Chapter)
- 2012–2013 Jack D. Gaskill Endowed Scholarship
- 2011–2013 John Tipton Scholarship in Optical Sciences
- 2009–2011 The University of Arizona - Academic Distinction, Deans List BS/BM

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## Professional Experience

### Vocational

- 2015–Present **Graduate Student Researcher**, *The Center for Energy Research at The University of Nevada, Las Vegas (UNLV)*, Las Vegas, NV.  
Supported energy-efficient materials design, fabrication, and analysis of thermoelectric materials, coordinated design and construction of prototype solar distillation and CSP systems, commenced laboratory study and transition into infrared coating materials research and additive manufacturing research.
- 2014 **Graduate Student Researcher**, *Large Optics Fabrication & Testing (LOFT) Group, Steward Observatory Mirror Lab*, Tucson, AZ.  
Developed processing and analysis routines for computing aspheric optical field positions, IR-PSF data, and Fourier domain representation of sequential raytrace and illumination design for Large Synoptic Survey Telescope (LSST) mirror components.
- 2014 **Graduate Research Intern/Member of Technical Staff**, *Integrated Sensor Design & Analysis Department, The Aerospace Corporation*, El Segundo, CA.  
Characterized focal plane arrays, refined computational models for IR hyperspectral sensor design simulation and analysis, and administered state-of-the-art metrological optical testing for remote sensing technologies.
- 2013–2014 **Graduate Student Researcher**, *Advanced Sensing Lab (ASL), University of Arizona College of Optical Sciences*, Tucson, AZ.  
Developed illumination scheme, design, and optimization metrics for Sunkists Research & Technical Division fruit graters along with phenomenological product classification and sorting algorithmic elaboration for machine-learning computer vision studies.
- 2012 **Undergraduate Student Researcher**, *Center for Energy Efficient Electronics Science (E3S) & Center for Integrated Access Networks (CIAN) Optoelectronics Research Experience for Undergraduates (REU), The University of California, Berkeley*, Berkeley, CA.  
Fabricated and tested silicon-photonics waveguides as hybridized in a LIDAR system with VCSEL and CMOS components for detection of varying optical communication systems runtime measurements, spearheaded analytical modeling and test for project design interferometric and polarimetric signal phenomenology in various electro-optical design configurations.
- 2011 **Undergraduate Student Researcher**, *Nanophotonic Materials Group, CREOL: The College of Optics & Photonics, The University of Central Florida*, Orlando, FL.  
Fabricated nanophotonic materials, semiconductor media, and photonics crystals. Gained involvement with academic directed research in chemical engineering and optical sciences; developed expertise with photolithography, SEM, AA, statistical sampling, and spectrophotometric experimentation.
- 2010 **Intern**, *Tronox, LLC.*, Henderson, NV.  
Supported engineering field research and chemical laboratory research for production process and maintenance yield of patented chemicals at Tronox LLC Henderson chemical plant. Expanded record tracking resources by authoring algorithms/macros to streamline digitization of archived databases.

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## Miscellaneous

- 2013–2015 **Assistant Music Director**, *Act 1 Academy of Performing Arts*, Tucson, AZ.  
Directed K-12 level students in music performance and musical theater productions, and provided instruction for music performance, technology, and composition. Prepared music transcriptions and personal compositions for performances, coordinated rehearsals and stage productions.
- 2012–2014 **Guest Composer, Information Technologies Specialist**, *Arizona Friends of Chamber Music & Reveille Mens Chorus*, Tucson, AZ.  
Supported the Arizona Friends of Chamber Music and Reveille Mens Chorus board of directors as a technological specialist, music arranger, and programmer. Coordinated strategies for audience development, marketing, advertiser & sponsor outreach, coordination, and communication.
- 2011–2012 **Student Curator**, *The Museum of Optics, Optical Sciences Center*, Tucson, AZ.  
Employed as a museum curator and information systems specialist for the UA College of Optical Sciences established Museum of Optics. Provided web design and photography services, and developed a newer SQL database infrastructure to overhaul collection items for port.
- 2010 **Music Instructor**, [*Various*], Tucson, AZ & Las Vegas, NV.  
Worked as a private music instructor for several students who coordinated through University or online services. Collaborated with numerous music chamber ensembles as a pianist and vocalist, including classical, jazz, dance, and musical theatre repertoire.
- 2008 **Music Director**, *St. Demetrios Greek Orthodox Church & Tucson Institute of Religion*, Tucson, AZ.  
Served in music director, pianist, and organist positions. Provided choral and congregation conducting & accompaniment, support for music technology needs, and coordinated output of choral arrangements and transcriptions.

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## Professional Associations

- 2016–Present ANS, The American Nuclear Society
- 2015–Present ASME, The American Society of Mechanical Engineers
- 2013–Present ADN, The Autodesk Developer Network
- 2010–Present SPIE, The International Society of Optics & Photonics
- 2010–Present OSA, The Optical Society
- 2009–2011 ACS, The American Chemical Society
- 2008–Present AHEPA, The American Hellenic Educational Progressive Association

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## Competencies & Qualifications

### Programming Languages + Developer Tools

- Basic Wordpress & Drupal CMS, LAMP Stack (Linux, Apache, MySQL, PHP)
- Intermediate LabVIEW, R, BASIC, PYTHON, HTML/CSS, L<sup>A</sup>T<sub>E</sub>X, iLogic, GNU Components: Octave & GNUPlot
- Advanced MATLAB, C/C++/C#, Computer Hardware + Information Technologies Support

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## General Design/Engineering Software

**Autodesk Design Suite:** Inventor, Simulation Multiphysics + Computational Fluid Dynamics, AutoCAD, Fusion; **Dassault Systèmes:** SolidWorks, CATIA; **Mathworks:** MATLAB, Simulink; **Wolfram Research:** Mathematica; **Zemax:** OpticStudio, ZEMAX; **Photon Engineering:** FRED; **Breault Research Organization (BRO):** ASAP, APEX; **Adobe:** Photoshop, Illustrator, InDesign, Fireworks, Premier, Audition, Dreamweaver; **Microsoft:** Word, Excel (w/VBA), Powerpoint, Access, OneNote, Project, Visio, Visual Studio

## Instrumentation Experience

**Mechanical:** Lathe, Mill, Drill Press, Grinders, Metrological Instrumentation, CAD/CAM, CNC Programming; **Chemical Laboratory:** OS/AES/MS/MFS/AAS. GC/LC/IC, Colorimetry, Voltammetry, Electrochemical Titration + Bench Cell Sensor Design, Calorimetry, Chemical Fractionation, Direct Laser Writing; **Optical:** Microscopy (SEM/TEM/Fluorescence), Infrared (FPAs, Photodetectors, Bolometers), Interferometry (Fizeau, Mach-Zehnder, Twyman-Green, PSI), Laser Systems (HeNe, CO<sub>2</sub>, Ti:Sapphire, Nd:YAG, VCSELs), Polarimetry, Hyperspectral Imaging, E-Beam Photolithography, Spectroscopic Systems (Raman, Scanning Monochromator), Scintillation

## Certifications

- 2011,'13,'15 *Photon Engineering:* FRED Optical Engineering Software Tutorial, Principles of Stray Light Short Course, Physical Optics Modeling Short Course
- 2014 *Breault Research Organization (BRO):* ASAP Introductory Tutorial + Advanced Illumination Design Tutorial
- UA College of Optical Sciences:* Optics of Imaging in Lithography Workshop + Optical Fabrication & Testing Workshop Certifications
- [Various]:* Chemical Hygiene/Laboratory Safety + PPE Handling, Radiation Safety, ESD, Cryogenics Handling, Laser Safety, Fire Prevention & Control, AED+CPR, First Aid, Hazard Communication, Hazardous Waste Handling

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## Publications

- 2017 D. E. Karas, J. Moon, C. Jose, S. Tam, Spectrally-Selective Copper-Oxide Spinel Absorber Coatings for High-Temperature Concentrated Solar Power Systems, [Pending Publication], 2017.
- 2014 S. M. Kuebler, A. Narayanan, D. E. Karas, and K. M. Wilburn, Low-distortion surface functionalization of polymeric microstructures, *Macromol. Chem. Phys.*, pp. 15331542, 2014.

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## Presentations

- 2014 SPIE/OSA Student Chapter Presentation, UA-OSC Student Optics Chapter The International Society of Optics & Photonics (SPIE), Optics+Photonics 2014 Conference; San Diego, CA

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- 2012 Fabrication & Testing of Silicon Photonic Waveguides for Loss Measurements of a Mach-Zehnder Interferometer in MEMS-EPHI Platform Energy Efficient Electronics Science (E3S) + Center for Integrated Access Networks (CIAN), The University of California, Berkeley; Berkeley, CA
- 2011 Characterizing Opto-Chemical Microfabrication and Electroless Copper Metallization for Direct Laser Writing of 3D-Nanophotonic Crystalline Structures CREOL: The College of Optics & Photonics, The University of Central Florida; Orlando, FL
- 2009 University of Arizona SAACS (Student Affiliates of the American Chemical Society): Stronger, Better, Faster, Greener Mar 2009 237th American Chemical Society (ACS) National Meeting; Salt Lake City, UT

## Languages

|              |                                     |  |
|--------------|-------------------------------------|--|
| Primary      | <b>English, C++</b>                 | <i>Complete read/write/execute fluency</i> |
| Intermediate | <b>Greek, French</b>                | <i>Con conversationally fluent</i>         |
| Basic        | <b>Spanish, Chinese (Mandarin )</b> | <i>Basic words and phrases only</i>        |