

# DARREN SHOLES

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## EDUCATION

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| <b>M.Sc.</b> | Mechanical Engineering<br>University of California, Berkeley<br>Energy and Multiphase Transport Lab<br>Advisor: Prof. Van P. Carey | 2015 |
| <b>B.Sc.</b> | Mechanical Engineering<br>California Polytechnic State University, San Luis Obispo   | 2013 |

## PROFESSIONAL EXPERIENCE

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| <b>Research Fellow</b>               | Fraunhofer EMI   Freiburg im Breisgau, Germany <ul style="list-style-type: none"><li>Design, build and test nanosatellites and nanosat components</li><li>Designed deployable gossamer structure launched aboard RocketLab It's Business Time Electron Rocket</li><li>Develop Python tools for simulation of satellite orbital and attitude dynamics</li><li>Signal processing tools for analysis of shock and vibration data</li></ul>  | December 2017 - Present     |
| <b>Senior Research Associate</b>     | Lawrence Berkeley National Lab   Berkeley, CA <ul style="list-style-type: none"><li>Designed, built and tested novel low-emission combustion technology (patent pending)</li><li>Developed OpenCV tool for analyzing Particle Image Velocimetry data</li><li>Developed python tools and statistical methodologies for analyzing large industrial data sets</li><li>Due to requests from colleagues, I developed and taught weekly seminar on "Python for Non-coders"</li></ul> | January 2016 - August 2017  |
| <b>Lead Design Engineer</b>          | LightManufacturing Systems   San Luis Obispo, CA <ul style="list-style-type: none"><li>Designed, built and tested solar concentrators for rotational mold manufacturing start-up</li><li>Machined, wired, and soldered heliostat components</li><li>Assembled and programmed heliostats</li></ul>  | September 2013 - March 2014 |
| <b>Heliostat Design Intern</b>       | Jet Propulsion Laboratory   Pasadena, CA <ul style="list-style-type: none"><li>Designed low-cost, lightweight solar concentrators</li><li>Created optical models for structural optimization of the heliostats</li><li>Created video tutorials and wrote "Quick Start to SolTrace" guide for team members</li></ul>  | June 2013 - September 2013  |
| <b>Energy Analysis Intern</b>        | Integral Group   Oakland, CA <ul style="list-style-type: none"><li>Wrote company's carbon strategy</li><li>Developed tools to calculate company-wide carbon emissions</li><li>Modeled building energy use with eQuest and EnergyPlus</li></ul>   | June 2012 - September 2012  |
| <b>Mechanical Integration Intern</b> | Jet Propulsion Laboratory   Pasadena, CA <ul style="list-style-type: none"><li>Assembled MGSE in clean room</li><li>Designed fixtures and MGSE in NX Unigraphics</li></ul>   | June 2011 - September 2011  |

## PUBLICATIONS

Rao, Prakash, Darren Sholes, and Joe Cresko. 2019. *Evaluation of U.S. Manufacturing Subsectors at Risk of Physical Water Shortages*. Environmental Science & Technology

Sholes et al. 2018. *A Dragsail De-orbit Subsystem for Small Satellites*. Advanced Lightweight Structures and Reflector Antennas.

Schimmerohn et al. 2018. *Additive Manufactured Structures for the 12U Nanosatellite ENRST*. 32nd Annual AIAA/USU Conference on Small Satellites: SSC18-WKVII-06.

Therkelsen et al. (Lawrence Berkeley National Laboratory). 2017. *The Value of Regression Models in Determining Industrial Energy Savings*. European Council for an Energy Efficient Economy: 3-079-16

Rao et al. (Lawrence Berkeley National Laboratory). 2017. *Estimating U.S. Manufacturing Water Use*. American Council for an Energy Efficient Economy: 01-00360053000025.

Therkelsen, Peter; Robert K Cheng; Darren Sholes. (Lawrence Berkeley National Laboratory). 2016. *Research and Development of Natural Draft Ultra-Low Emissions Burners for Gas Appliances*. California Energy Commission. Publication number: CEC-500-2016-054.

## HARDWARE SKILLS

CAD | Mechanisms | Machinery | Lean  
Combustion | Solar Concentrators | Design for  
CNC | Soldering | Design for 3D Printing | Basic  
Fabrication | Design for Waterjet | Design for  
Laser cutter

## SOFTWARE SKILLS

Python | Data Wrangling (pandas) | Signal  
Processing (scipy) | Data Visualizations (plotly) |  
OpenCV | Javascript | HTML/CSS | Git | Matlab |  
GIS | Arduino | REAPER

## LANGUAGE

English: Native  
German: Limited working proficiency  
Spanish: Limited working proficiency

## JOY

Guitar | Making Music | Brewing Beer |  
Basketball | Brazilian Jiu Jitsu | Camping |  
Hiking | Backpacking | Cooking

## ACTIVITIES

<b>Mentor</b>	Students for Environmental Energy Development   Berkeley	Spring 2015
<b>Mentor</b>	CRS Be a Scientist Program   Berkeley	Fall 2014
<b>Volunteer</b>	Science and Engineering Community Outreach   Berkeley	Fall 2014
<b>Work + Cultural Exchange</b>	WWOOF   Chilean Patagonia <ul style="list-style-type: none"><li>Volunteered on organic farms in rural Patagonia</li><li>Sustainable living strategies, local ecology, local culture</li></ul>	March 2014 - May 2014
<b>International Student Exchange</b>	University of Navarra (TECNUN)   San Sebastian, Spain <ul style="list-style-type: none"><li>Engineering classes taught in both English and Spanish</li><li>Class trips and cultural exchanges with local Basque and Erasmus students</li></ul>	September 2011 - December 2011

## REFERENCES

Dr. Prakash Rao, Research Scientist  
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Dr. Martin Schimmerohn, Group Leader  
Fraunhofer EMI, Spacecraft Technology Group  
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