

# Caroline S. Gorham

(703) 362-1852  
caroling@cmu.edu

## Education

- Carnegie Mellon University, Pittsburgh, PA Aug 2015 –  
Ph.D. Student, Materials Science  
Advisor: Prof. David Laughlin
- Carnegie Mellon University, Pittsburgh, PA May 2015  
M.S. Mechanical Engineering  
Advisor: Prof. Alan J. H. McGaughey, GPA 4.0/4.0, (4 engineering courses)
- University of Virginia, Charlottesville, VA Apr. 2012 - Dec. 2013  
Graduate Research Assistant, Mechanical and Aerospace Engineering  
Advisor: Prof. Patrick E. Hopkins, GPA 3.9/4.0, (9 engineering courses)
- King's College London, London, UK June 2010  
B.Eng. Mechanical Engineering, 1<sup>st</sup> Classification Honours  
GPA 3.9/4.0, (24 engineering courses)

## Professional and Research Experience

- National Renewable Energy Laboratory: Computational Division** Golden, CO Summer 2015  
Performed linear analysis to correlate the frequency dependence of hole conduction in conjugated polymers, for improved organic photovoltaic material design and selection
- NASA Glenn: Photovoltaic and Power Technologies Division** Cleveland, OH Summer 2014  
Interrogated vibrational mode properties of bulk C60 for improved photovoltaic materials
- Raytheon Company (IIS): System Engineer and Integrator** Aurora, CO 2010-2011  
Integrated three system level components for the net-centric ground control system for GPS OCX  
Developed test procedures to ensure high-value functionality of the ground control system
- Lawrence Berkeley National Laboratory: DOE Science Internship** Berkeley, CA Summer 2010  
Conducted experiments, at 77 K with a high-intensity applied B, to characterize current entrance lengths in superconducting wires - to minimize material usage in high-throughput studies
- NASA Langley: Mechanical Systems Engineering Internship** Hampton, VA Summer 2008  
Fabricated and tested a minimal risk method for testing the moment of inertia of the Orion module  
Presented research to executives at NASA headquarters in Washington D.C., in a National broadcast

## Awards and Honors

- NASA Space Technology Research Fellowship 2013 - 2015
- NSF Graduate Research Fellowship, Honorable Mention 2013

## Skills and Certifications

Advanced level MATLAB modeling and GUI development

Computational management: linux, PBS-job-queuing, github

Word editors and document preparation: Vi, LaTeX, emacs

Programming: MATLAB, python, bash, FORTRAN

Simulations: LAMMPS (molecular dynamics), GULP (harmonic lattice dynamics)

Engineer-In-Training, Mechanical

2011

## Publications

### Preprint:

5. **C. S. Gorham**. "Energy density and thermal diffusivity of Ioffe-Regel confined vibrations in bulk amorphous silica," In preparation.

### In Print / In Press:

4. R. Cheaito, **C. S. Gorham**, A. Misra, K. Hattar and P. E. Hopkins. "Thermal conductivity measurements via time-domain thermoreflectance for the characterization of radiation induced damage". *Journal of Materials Research*, 30, pp 1403-1412, 10.1557/jmr.2015.11, 2015.
3. **C. S. Gorham**, K. Hattar, R. Cheaito, J. C. Duda, J. T. Gaskins, T. E. Beechem, J. F. Ihlefeld, L. B. Biedermann, E. S. Piekos, D. L. Medlin and P. E. Hopkins. "Ion irradiation of the native oxide/silicon surface increases the thermal boundary conductance across aluminum/silicon interfaces". *Physical Review B*, 90, 024301, 2014.
2. **C. S. Gorham**, J. T. Gaskins, G. N. Parsons, M. D. Losego and P. E. Hopkins. "Density dependence of the room temperature thermal conductivity of atomic layer deposition-grown amorphous alumina ( $Al_2O_3$ )". *Applied Physics Letters*, 104, 253107, 2014.
1. B. M. Foley, **C. S. Gorham**, J. C. Duda, R. Cheaito, C. J. Szejewski, C. Constantin, B. Kaehr and P. E. Hopkins. "Thermal conductivity of water insoluble protein films: anharmonic interactions of vibrations in a fractal structure". *Journal of Physical Chemistry Letters*, 5(7), pp. 1077-1082, 2014.

### Refereed Conference Proceedings:

1. A. Godeke, P. Bish, D. R. Dietderich, **C. S. Gorham**, A. R. Hafalia, H. C. Higley, N. L. Liggins, M. G. T. Mentink, G. L. Sabbi. "Novel methods for the measurement of the critical current of superconducting wires". *AIP Conference Proceedings*, 1435, 209, 2012.

## Technical and Poster (T/P) Presentations

- 1T. **C. S. Gorham** and A. J. H. McGaughey. "Thermal transport in buckminsterfullerene molecular solids at and above room temperature". American Physical Society, 03/2015, San Antonio, TX.
- 3P. **C. S. Gorham** and A. J. H. McGaughey. "Thermal transport in buckminsterfullerene molecular solids at and above room temperature". Carnegie Mellon University, 03/2015, Pittsburgh, PA.

<sup>2</sup>P. C. S. Gorham, B. M. Foley, J. C. Duda et al. "Thermal conductivity of water insoluble protein films: anharmonic coupling in a fractal structure". American Society of Mechanical Engineers, 11/2013, San Diego, CA.

<sup>1</sup>P. C. S. Gorham, K. Hattar, R. Cheaito et al. "Effects of surface treatments on thermal boundary conductance across Al/Si interfaces". Materials Research Society, 04/2013, San Francisco, CA.

## Teaching Experience

|   |               |
|---|---------------|
| Thermoelectrics Lab. Instructor<br>University of Virginia, Department of Mechanical and Aerospace Engineering | 01/13 - 05/13 |
|---|---------------|

## Professional Societies

|  |            |
|--|------------|
| National Society of Professional Engineers | Since 2011 |
| Materials Research Society                 | Since 2012 |
| American Society of Mechanical Engineers   | Since 2012 |
| Society of Women Engineers                 | Since 2013 |
| American Physical Society                  | Since 2014 |
| American Chemical Society                  | Since 2015 |

## Other Education

|   |             |
|---|-------------|
| Developing Your Creativity<br>Central St. Martin's College of Art and Design, London, UK  | Winter 2009 |
| Summer Institute of General Management<br>Stanford Graduate Business School, Stanford, CA | Summer 2009 |