Carla J. Becker

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(256) 348-6748
U.S. Citizen

OBJECTIVE

To find a summer internship at the Jet Propulsion Laboratory (JPL) for 2017 in an area related to any of the following: condensed matter physics, nanoelectronics, optoelectronics, micro/nano electromechanical systems (MEMs/NEMs), or computational fluid dynamics.

EDUCATION

Harvey Mudd College (HMC), Claremont, California — Expected May 2018
B.S. Physics, B.S. Chemistry

Randolph School, Huntsville, Alabama — May 2014
Valedictorian

PROJECT EXPERIENCE

Engineering Researcher
HMC Department of Engineering — Jan 2017 – present
Supervisor: Prof. Matthew Spencer
- Developed simulations of tunnel field effect transistors (TFETs) to determine their physical plausibility

Howard Hughes Medical Institute Student Fellow
HMC Department of Chemistry — Jan 2016 – present
Supervisor: Prof. Whitney C. Duim
- Performed single-molecule super-resolution fluorescence microscopy with the goal of modeling the aggregation of the mis-folded protein involved in Huntington's disease
- Helped build microscope and develop imaging process for characterizing aggregation

Student Body Senate Chair
Associated Students of Harvey Mudd College (ASHMC) — Mar 2016 – present
- Lead twice-weekly meetings of 30-50 people
- Regularly presented to faculty, administrators, and board of trustees
- Envisioned, organized and executed initiatives, events, and projects for the student body's benefit

Howard Hughes Medical Institute Student Fellow
HMC Department of Biology — Jan 2015 – Dec 2015
Supervisors: Prof. Dan Stoebel, Prof. Eliot Bush
- Coded and determined bioinformatic methods used to illuminate testable hypotheses in the lab
- Used standard molecular and microbiological techniques to investigate transcriptional regulation related to the stress response in *E. coli*

Science and Engineering Apprenticeship Program (SEAP) Apprentice
Aviation and Missile Research, Development, and Engineering Center — May 2011 – Sep 2014
Supervisors: Dr. Paul Ruffin, Eugene Edwards, Gayla McMichael
- Gained experience with fiber optics, acoustic sensors, foams, and equipment/instruments associated with these technologies
- Developed educational outreach materials for grades K-8

PUBLICATIONS

"The genome-wide transcriptional response to varying RpoS levels in Escherichia coli K-12"
Journal of Bacteriology, under Prof. Dan Stoebel and Eliot Bush, Jan 2017

"Assessment of acoustic and thermal sensors for monitoring gun barrel degradation"
AMRDEC, under Eugene Edwards, Sep 2013

"Internal optical spectroscopic real-time diagnosis technique"
AMRDEC, under Dr. Paul Ruffin, Sep 2012

RELEVANT SKILLS

Programming Languages: MATLAB, Python, Mathematica, Verilog-A, LaTeX, Unix.
Laboratory Skills: Sterile technique, NMR, GCMS, optical table and laser setup

WORK EXPERIENCE

Harvey Mudd College

Lab Assistant, Department of Biology	May 2011 – Sep 2014
Tour Guide, Office of Admissions and Financial Aid	Jan 2015 – present
Tutor, Department of Biology	Jan 2016 – Dec 2016
Grader, Department of Chemistry	Sep 2015 – May 2016
Caller, Office of Annual Giving	Oct 2014 – Dec 2015

AWARDS AND HONORS

2016 Alabama Alumnus of the Year, Future City Competition
Bausch and Lomb Honorary Science Award (2014)
Wernher von Braun Award for academic excellence and integrity (2014)
1st Place, SEAP Technical Paper Competition (2012, 2013)

RELEVANT COURSEWORK

Physics: Statistical Mechanics and Thermodynamics, Theoretical Mechanics, Electronics Laboratory, Quantum Physics (Quantum Mechanics I), Modern Physics Laboratory, Electromagnetic Theory and Optics, Mechanics and Wave Motion, Special Relativity, Intro Physics Laboratory.

Mathematics: Fourier Series and Boundary Value Problems, Linear Algebra/ Differential Equations II, Multivariable Calculus, Differential Equations, Linear Algebra, Probability and Statistics, Calculus.

Engineering: Introduction to Signals and Systems.

Chemistry: Chemical Analysis and Laboratory, Group Theory/Quantum Chemistry/Spectroscopy, Carbons (Organic I), Physical Chemistry and Laboratory, Energetics/Dynamics/Structure, Intro Chemistry Laboratory

Computer Science: Robotics Laboratory, Principles of Computer Science, Introductions to Biology and Computer Science.

Biology: Molecular Genetics.

In Progress/Planned: Quantum Mechanics II, Adv. Analytical Chemistry and Laboratory, Biochemistry and Laboratory, Digital Electronics, Engineering Mathematics, Electric & Magnetic Circuits/Devices.

PRESENTATIONS

Carla Becker, Ali Khan, Rebecca Harman, Rachel Levy, Whitney C. Duim
"Characterizing the Huntingtin Aggregation Pathway via Super-Resolution and Single Molecule Fluorescence Microscopy" presented at:
- Howard Hughes Medical Institute Poster Session at the Claremont Colleges (Sep 2016)
- Conference for Undergraduate Women in Physics Poster Session (Jan 2017)
- American Chemical Society, Division of Biological Chemistry Poster Session (Apr 2017).

Carla Becker, Eliot Bush, Dan Stoebel
"A Bioinformatics Assessment of Sensitivity Profiles in *E. coli*" presented at:
- Howard Hughes Medical Institute Poster Session at the Claremont Colleges (Sep 2015)
- Southern California Conference for Undergraduate Research Poster Session (Mar 2016)