

Grace Genszler

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EDUCATION

THAYER SCHOOL OF ENGINEERING - DARTMOUTH COLLEGE | BACHELOR OF ENGINEERING

Concentration in Computational Engineering, June 2019 | Hanover, NH, United States

QuestBridge Scholar • GPA: 3.57

Capstone: DEMETER - Deployable Enclosed Martian Environment for Technology, Eating, and Recreation, Winner of NASA's 2019 BIG Idea Challenge

WHEATON COLLEGE | BACHELOR OF ARTS IN PHYSICS

Minor in Mathematics, May 2018 | Norton, MA, United States

Magna Cum Laude • Dean's List (All Semesters) • Phi Beta Kappa Member-Elect • GPA: 3.83

Honors Thesis: Numerical Analysis of Periodic Motion of Tethered Satellite Systems

RESEARCH EXPERIENCE

MCGILL UNIVERSITY | UNDERGRADUATE RESEARCH ASSISTANT

5/18 – 8/18 | Montreal, QC, Canada

In Dr. Mathias Legrand's lab, examined and detected periodic solution manifolds of the impact of aircraft engine rotary blades on their casings using numerical analysis in MATLAB. Analyzed the stability of the algorithms and solutions in preexisting bifurcation and limit cycle continuation software.

WHEATON COLLEGE | SENIOR HONORS THESIS CANDIDATE

8/17 – 5/18 | Norton, MA, United States

Developed MATLAB model of tethered shuttle-satellite systems. Examined system parameters for optimal satellite deployment under a tether deployment control law. Advised by Dr. Geoffrey Collins.

UNIVERSITY OF SOUTHERN CALIFORNIA | UNDERGRADUATE RESEARCH ASSISTANT

6/17 – 8/17 | Los Angeles, CA, United States

Wrote MATLAB program to solve reaction forces of determinate and indeterminate beams, graph internal shear and moment diagrams, and compute deflections to supplement curricula materials for Dr. Vincent Lee.

YALE UNIVERSITY | UNDERGRADUATE RESEARCH FELLOW

6/16 – 8/16 | New Haven, CT, United States

Under the guidance of Dr. Charles Ahn, explored a new formation process for high temperature superconducting iron(II) selenide nanorings. Prepared samples, collected data, and compiled images for analysis in Gwyddion.

WHEATON COLLEGE | UNDERGRADUATE RESEARCH ASSISTANT

5/15 – 8/15 | Norton, MA, United States

Investigated the fluorescent properties of rare earth ions using luminescent spectroscopy with Dr. John Collins. Wrote software to format data in Python and analyzed using OriginLab.

PROFESSIONAL EXPERIENCE

DARTMOUTH COLLEGE | ENGINEERING TEACHING ASSISTANT

3/17 – 6/17; 9/18-6/19 | Hanover, NH, United States

Assisted instructors in Systems and Control Theory. Directed experimental lab exercises. Held office hours for MATLAB coding and problem sets. Graded assignments. Proctored exams. Wrote answer keys to practice problems. Edited 300 pages of lecture notes in \LaTeX . Awarded a citation as head teaching assistant for Systems.

WHEATON COLLEGE | PHYSICS & MATHEMATICS TUTOR

8/17 – 5/18 | Norton, MA, United States

Ran help sessions for physics and calculus courses. Updated professors weekly on students' mastery of the material.

WHEATON COLLEGE | OBSERVATORY ASSISTANT

8/14 – 5/16; 8/17 - 5/18 | Norton, MA, United States

Conducted sky shows for Wheaton's campus and the general community at large. Set up manual and remote controlled telescopes and talked about the astronomical objects being viewed.

DARTMOUTH COLLEGE | MATHEMATICS TUTOR

8/16 – 3/17 | Hanover, NH, United States

Created personalized curricula to help students improve in calculus and on building stronger study skills.

WHEATON COLLEGE | MAKERSPACE ASSISTANT

8/17 - 12/17 | Norton, MA, United States

Assisted students using 3D printers, laser cutters, soldering tools, mills, and lathes. Created social media presence through Facebook and Instagram.

WHEATON COLLEGE | PHYSICS TEACHING ASSISTANT

9/15 - 5/16 | Norton, MA, United States

Organized labs and guided students through example problems during lecture. Ran extra exam review sessions.

SELECT PROJECTS

DARTMOUTH COLLEGE | NASA BIG IDEA CHALLENGE WINNING DESIGN: DEMETER

9/18 - 4/19 | Hanover, NH, United States

Designed a closed system Martian Greenhouse to support a four-person crew for a 600-sol mission on Mars. Lead member on an eight-person research team for nutrition studies; entry, descent, and landing analysis; and integrated model simulations. Concept of design won NASA's 2019 BIG Idea Challenge.

DARTMOUTH COLLEGE | CULINARY HEAT TRANSFER

4/19 - 6/19 | Hanover, NH, United States

Studied heat transfer in pie baking to determine optimal pan material for evenly baked pie. Primary member on a team of three to handle theoretical derivations, computational model production, and experimental data visualization. Used an electrical circuit analog of the thermal system to derive the state-space form. Wrote a 150 line MATLAB script to simulate the +600 state model.

DARTMOUTH COLLEGE | VERTICAL FARMING LIGHTING OPTIMIZATION

2/19-3/19 | Hanover, NH, United States

Examined the efficiency of LED placement and intensity in a cascading hydroponic growing tray configuration to promote improved growth of wheat. Simulated using Yee's 2D Finite-Difference Time-Domain scheme.

WHEATON COLLEGE | RESEARCH NIGHT

10/17-11/17 | Norton, MA, United States

As president of the Physics & Astronomy club, planned and hosted the department's first annual Research Night Panel. Invited student panelists to discuss research and the application process for funding, organized catering, acted as panel moderator.

WHEATON COLLEGE | HEAD OF THE PEACOCK REGATTA

2/15-4/15 | Norton, MA, United States

Collaborated on a six-person team to construct and sail a four-person boat in Wheaton's annual regatta. Assisted in the conceptual design and building process of a PVC and tarp boat. Researched various water proofing techniques. Team finished first in the small boat competition and second overall.

SELECT COURSEWORK

ENGINEERING

Numerical Methods in Computation
Modern Control Theory
Electromagnetic Wave Modeling
Classical Control Theory

PHYSICS

Electric & Magnetic Fields
Quantum Mechanics
Classical Mechanics
Experimental Physics

MATHEMATICS

Difference Equations
Differential Equations
Linear Algebra
Multivariable Calculus

SKILLS

LANGUAGE & SOFTWARE PROFICIENCY

MATLAB • Simulink • Python • \LaTeX • OriginLab • Solidworks • AutoCAD

LANGUAGE & SOFTWARE COMPETENCY

LabVIEW • C/C++ • Mathematica • ANSYS tools • COMSOL • Stella Architect

EXPERIENCE USING

Machine Tools • 3D Printers • Laser Cutters • Atomic Force Microscopy • Scanning Electron Microscopy

AWARDS

DARTMOUTH SOCIETY OF ENGINEERS PRIZE | DARTMOUTH COLLEGE

6/19 | Hanover, NH, United States

DEMETER: Deployable Enclosed Martian Environment for Technology, Eating, and Recreation (\$100)

NASA 2019 BIG IDEA CHALLENGE WINNER | NASA AND THE NATIONAL INSTITUTE OF AEROSPACE

4/19 | Hampton, VA, United States

DEMETER: Deployable Enclosed Martian Environment for Technology, Eating, and Recreation (\$5,000)

FULBRIGHT CANADA SEMI-FINALIST | INSTITUTE OF INTERNATIONAL EDUCATION

2/19 | New York, NY, United States

HOWARD E. "HAL" SOMMER 1940 SCHOLARSHIP | DARTMOUTH COLLEGE

10/18 | Hanover, NH, United States

H. M. PASTRA-LANDIS PRIZE IN PHYSICS | WHEATON COLLEGE

5/18 | Norton, MA, United States

Excellence in physics (\$600)

TEACHING ASSISTANT CITATION | DARTMOUTH COLLEGE

7/17 | Hanover, NH, United States

Systems with Dr. Jason Stauth

SUNNY CHEN '08 SCHOLARSHIP | WHEATON COLLEGE

9/15; 9/17 | Norton, MA, United States

CHARLES A. DANA SCHOLARSHIP | WHEATON COLLEGE

9/16 | Norton, MA, United States

PAPERS AND PRESENTATIONS

REPORTS

Z. Ault Rivas, A. Escalona, **G. Genszler**, Thomas. L. Hodsden III, M. McGonagle, D. Dick, P. Mahoney, C. Yu, (April, 2019) DEMETER: Mars Greenhouse Design, BIG Idea Forum, Langley Research Center, Hampton, VA, United States.

G. Genszler, (May, 2018) Numerical Analysis of Periodic Motion of Tethered Satellite Systems, Wheaton College, Norton, MA, United States.

SELECT PRESENTATIONS

G. Genszler, G. Collins, (April, 18) Numerical Analysis of Periodic Motion of Tethered Satellite Systems, National Conference for Undergraduate Research, University of Central Oklahoma, Edmond, OK, United States.

G. Genszler, R. Peng, C. Ahn, (August, 2016) High Temperature Superconducting Nanoring Formation Process of Iron(II) Selenide Grown on Strontium Titanium Oxide Substrates, Leadership Alliance National Symposium, Stamford, CT, United States.

POSTERS

G. Genszler, Z. Ault Rivas, A. Escalona, Thomas. L. Hodsden III, M. McGonagle, D. Dick, P. Mahoney, C. Yu, (July, 2019) DEMETER: Mars Greenhouse Design, International Conference for Environmental Systems, Boston, MA, United States.

G. Genszler, D. Urman, M. Legrand, (August, 2018) Detection of Periodic Solutions in Non-Linear Differential Equations Using Shooting and Continuation Methods, SURE Poster Presentation Session, McGill University, Montreal QC, Canada.

G. Genszler, J. Collins, (April, 2016) Thermal Quenching of Red Emission from Pr-Doped Niobates under UV Excitation, Spring Meeting of the New England Section of the American Physical Society, Wheaton College, Norton, MA, United States.

LEADERSHIP AND EXTRACURRICULARS

AEROSPACE CLUB AND IVY SPACE COALITION | DARTMOUTH COLLEGE

5/17-6/19 | Hanover, NH, United States

PHYSICS & ASTRONOMY CLUB | WHEATON COLLEGE

President 3/15-5/18; Member 8/14-3/15 | Norton, MA, United States

MAY FELLOWS SOCIETY | WHEATON COLLEGE

Review Board Committee 11/17-5/18; Member 11/14-11/17 | Norton, MA, United States

ACADEMIC OUTREACH

DARTMOUTH ALUMNI INTERVIEWER | DARTMOUTH COLLEGE

11/19-Present | Hanover, NH, United States

SCHOLARSHIP SELECTION COMMITTEE MEMBER | ASHLAND'S TECHNOLOGY FUTURE INC.

6/19-Present | Ashland, WI, United States

ACADEMIC ENGAGEMENT SPEAKER | ASHLAND HIGH SCHOOL

12/14-Present | Ashland, WI, United States

WOMEN IN STEM SUMMIT LIAISON | WHEATON COLLEGE

4/18 | Norton, MA, United States

SUMMER HIGH SCHOOL INTENSIVE IN NEXT-GENERATION ENGINEERING MENTOR | UNIVERSITY OF SOUTHERN CALIFORNIA

6/17-8/17 | Los Angeles, CA, United States

AMERICAN PHYSICAL SOCIETY SPRING CONFERENCE PRIMARY ORGANIZER | WHEATON COLLEGE

4/16 | Norton, MA, United States