

# NICHOLAS FREEMAN MEHRLE

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## EDUCATION

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### Massachusetts Institute of Technology

Ph.D. Student - Physics (Astrophysics)

- **Advisor:** Professor Ian Crossfield
- **GPA:** 5.0/5.0
- C. M. Clay Physics Fellow

Cambridge, MA

9/2017 - Present

### Johns Hopkins University

M.A. Physics and Astronomy

- **Advisor:** Professor Tobias Marriage
- **Thesis:** Design of the Cosmology Large Angular Scale Surveyor (CLASS) Polarization Modulators

Baltimore, MD

5/2016

### Johns Hopkins University

B.S. Physics with honors

- **Additional Majors:** Mathematics, Applied Mathematics & Statistics
- **GPA:** 3.91/4.0

Baltimore, MD

5/2016

## EXPERIENCE

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### Massachusetts Institute of Technology

Graduate Student

- Characterizing atmospheres of extra-solar planets via high resolution ground based spectroscopy
- Forward modeling / parametric retrieval of exoplanet atmospheres

Cambridge, MA

9/2017 - Present

### University of Maryland

Web Developer - Department of Astronomy

- Designed and built online educational tools to illustrate astronomy concepts

College Park, MD

12/2016 - 9/2017

### Optiver US LLC

Derivatives Trader - Agricultures Team

- High frequency commodities options market maker
- Priced options using time-series analysis and machine learning techniques

Chicago, IL

7/2016 - 10/2016

### Johns Hopkins University

Research Assistant - Department of Physics and Astronomy

- Constructed variable delay polarization modulator for microwave band telescope
- Master's thesis on telescope design and physics of Cosmic Microwave Background

Baltimore, MD

5/2013 - 5/2016

### CERN

Research Assistant - Compact Muon Solenoid

- University of Michigan Semester at CERN program scholar
- Performed statistical analysis to discriminate production methods of Higgs boson

Geneva, CH

1/2015 - 5/2015

### Johns Hopkins University Applied Physics Lab

Technical Intern - Applied Concepts and Technology Group

Laurel, MD

5/2014 - 8/2014

- Developed and tested feature estimation algorithms
- Integrated radar model into simulation environment

## PAPERS

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- Thomas Essinger-Hileman, et al. "CLASS: the Cosmology Large Angular Scale Surveyor ", *Proc. SPIE* 9153, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy VII, 91531I (July 23, 2014); doi:10.1117/12.2056701
- John W. Appel, et al. "The Cosmology Large Angular Scale Surveyor (CLASS): 38-GHz Detector Array of Bolometric Polarimeters ", *Proc. SPIE* 9153, Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy VII, 91531J (July 23, 2014); doi:10.1117/12.2056530

## TEACHING/MENTORING

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- Grader, 8.21 Physics of Energy, MIT 1/2018 - 5/2018
- Creator/Instructor, "Rebuild", MIT IAP non-credit class 1/2018
- Creator/Instructor, "The Flat Earth and Debunking Conspiracy Theories" MIT SPLASH 11/2017
- Volunteer, "Adopt-a-Physicist" program, American Institute of Physics 10/2017
- TA, Differential Equations, Johns Hopkins University 9/2015 - 12/2015
- Tutor, Introductory Physics, Johns Hopkins University 9/2013 - 9/2014

## MISCELLANEOUS

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- Computer Skills:** Python, Java, JavaScript, C, C++, Matlab, Mathematica, R, HTML, CSS,  $\text{\LaTeX}$ , SolidWorks, VBA
- Certifications:** Technician Class Ham Radio Operator  
Student Pilot
- Activities:** MIT Students for the Exploration and Development of Space - Cofounder  
MIT Sidewalk Astronomy
- Honors:** Phi Beta Kappa  
Sigma Pi Sigma  
Johns Hopkins Univ. Dean's List all semesters
- Testing:** Physics GRE - 960/990 (92nd percentile)  
General GRE - V: 165/170 (95th), Q: 169/170 (97th), W: 5.5/6 (98th)