

# Maria E. Steinrueck

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## Education

**University of Arizona, Tucson, AZ, USA** 2016–present  
PhD program in Planetary Sciences

**Vienna University of Technology, Vienna, Austria** 2010–2015  
M.S. in Technical Physics, specializing in Theoretical Physics. Graduated with distinction in November 2015.  
B.S. in Technical Physics. Graduated with distinction in August 2013.

**University of Washington, Seattle, WA, USA** 2013–2014  
Transatlantic Science Student Exchange Program – Study Abroad (full academic year)

## Research Experience

**Graduate Research Assistant** 2016–present  
Lunar and Planetary Laboratory, University of Arizona  
Advisors: Prof. Adam Showman, Dr. Vivien Parmentier  
Understanding the impact of including disequilibrium chemistry in General Circulation Models (GCM) of Hot Jupiters

**Master's Thesis** 2015  
Institute for Astrophysics, University of Vienna  
Advisors: Dr. Eduard Vorobyov, Prof. Manuel Guedel  
Thesis title: "Ejection of substellar objects from accretion disks through stellar encounters"  

- Coded an extension to include the fly-by of a second star for a hydrodynamics code used to study the evolution of protostellar disks
- Ran and analyzed a series of numerical simulations of stellar encounters

**Research Project on Extrasolar Planets** 2013–2014, 9 months  
Astronomy Department, University of Washington  
Advisors: Dr. Ian Dobbs-Dixon, Prof. Eric Agol  
Estimating the stratospheric heating in Hot Jupiters due to the interaction of winds with the stellar magnetic field  

- Discretized the induction equation on a spherical grid
- Developed and coded a model for calculating conductivity

**Bachelor's Thesis in Experimental High Energy Physics** 2012, 10 weeks  
Institute of High Energy Physics (HEPHY), Austrian Academy of Sciences  
Advisors: Dr. Wolfgang Waltenberger, Dr. Claudia-Elisabeth Wulz  
Thesis title: "Decomposition of the phenomenological MSSM into Simplified Model Spectra"  

- Analyzed and compared the decomposition of two samples of subsets of phase space points in the phenomenological MSSM (pMSSM) into Simplified Model Spectra using ROOT and Python
- Added improvements to tools for analyzing pMSSM points in Python

## Publications

Vorobyov, E. I., **Steinrueck, M. E.**, Elbakyan, V., Guedel, M. (2017): Formation of freely floating sub-stellar objects via close encounters. *Astronomy & Astrophysics*, A107, doi:10.1051/0004-6361/201731565.

## Conference Presentations

**Steinrueck, M. E.**, Parmentier, V., Showman, A. P. (October 2017): The effects of disequilibrium carbon chemistry in general circulation models of hot Jupiters. Oral presentation at the 49th Division for Planetary Science meeting.

## Teaching & Mentoring Experience

### **Lunar and Planetary Lab, University of Arizona 2017–present**

Teaching assistant for the following courses:

- *PTYS 170B2 The Universe and Humanity: Origins and Destiny* (Spring semester 2017 and 2018)
- *PTYS 170A1 Planet Earth: Evolution of the Habitable World* (Fall semester 2017)

### **Pupils Attending University 2012–2015**

Program enabling high school students to enroll early at university, run by the Austrian Research and Support Centre for the Gifted and Talented (OEZBF)

- Mentored four students over the course of a year each

### **Institute for Theoretical Physics, Vienna University of Technology 2011–2014**

Teaching assistant for the following courses:

- *Quantum Mechanics 1* (Fall semester 2014 and 2012)
- *Electrodynamics 1* (Spring semester 2013)
- *Mathematical Methods of Theoretical Physics* (Fall semester 2011)

## Awards

*Leif Andersson Graduate Student Award for Service* Lunar and Planetary Laboratory, University of Arizona 2018

*Galileo Circle Scholarship* College of Science, University of Arizona 2018

*Hartmann Student Travel Grant* Division for Planetary Science/AAS 2017

*Leistungsstipendium (Academic Merit Award)* Vienna University of Technology 2012

## Technical Skills

### **Programming Languages**

Fortran, Python, Matlab, PHP, C, C++

## Outreach

### **Lunar and Planetary Lab, University of Arizona 2016–present**

Volunteered at the graduate student outreach booth at

- Tucson Festival of Books (March 2016, March 2018)
- Solar Eclipse 2017
- Summer Science Saturday (August 2016)
- SpaceFest (June 2016)
- STEAMworks (April 2016)

**Strange New Worlds: A Star Trek and Science Podcast 2017**

Guest on Episode 18: *The Chemistry & Clouds of Hot Jupiters*

**Women Techmakers Tucson 2016–present**

Member of the organizing committee of the Women Techmakers Tucson Hackathon

**Physikmobil, Vienna 2012–2013**

Physics outreach campaign

- Explained physics interactively to children (ages 6–14) with experiments using everyday life objects at schools, in public parks and at events

**Professional & Departmental Service**

Coordinator of the Lunar and Planetary Lab Women's group 2016–present

UA Graduate and Professional Student Council Travel Grant Judge 2018

Member of the Lunar and Planetary Lab Conference (LPLC) planning committee 2016–2017

**Professional Affiliations**

Division of Planetary Science of the American Astronomical Society (Junior Member)