# Ari Silburt

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## EDUCATION & WORK EXPERIENCE

*Data Science Fellow* 2018–present
Location: Insight Data Science, New York, NY, USA
Project: Built `http://git-screened.icu/` – a tool for automating Github repository assessment.

*Postdoc, Eberly Fellow, Astrophysics* 2017–2018
Location: Penn State University, State College, PA, USA
Professor/Mentor: Prof. Eric Ford
Research: Deep learning to automate crater classification on the Moon and other Solar System bodies.

*Data Scientist* 2017
Location: Geotab, Oakville, ON, Canada
Manager: Mike Branch
Contract Work: Detect potholes via machine learning using Geotab's vehicle accelerometer data.

*Doctorate of Philosophy, Astrophysics* 2012–2017
Location: University of Toronto, Toronto, ON, Canada
Advisor: Prof. Hanno Rein
Thesis: Statistics, Formation and Stability of Exoplanetary Systems.

*Bachelor of Science, Honours Physics with Math minor* 2008–2012
Location: Mount Allison University, Sackville, NB, Canada
Advisor: Prof. David Hornidge
Thesis: Improvement of the Compton Beam Asymmetry.

## AWARDS & HONOURS

*Eberly Fellowship*: Awarded to attract exceptional early career scientists to Penn State to enhance their career goals in the vibrant, highly collaborative environment. 2017–2018

*NSERC PGS-D Research Grant*: Graduate research award from the National Science and Engineering Research Council of Canada. 2015–2017

*Walter C Sumner Fellowship*: National achievement award for academics and research. 2015–2017

*SGS Conference Grants*: Two grants from the University of Toronto School of Graduate Studies, awarded to present original research at top tier conferences. 2015, 2016

*NSERC CGS-M Research Grant*: Graduate research award from the National Science and 2013–2014

Engineering Research Council of Canada.

*Dr. R. N. Varma Memorial Award*: Graduating Mount Allison University physics student with the highest GPA. 2012

*Donald G. MacGregor Scholarship*: 3rd year Mount Allison University physics student with the highest GPA. 2011

*NSERC USRA Research Grant*: Two Undergraduate summer research awards from the National Science and Engineering Research Council of Canada. 2010–2012

*Harrison McCain Scholarship*: Mount Allison University scholarship for academic excellence. 2008–2012

## PUBLICATIONS

**Silburt, A.**, Ali-Dib, M., et al. "*Lunar Crater Identification via Deep Learning*", 2018, Icarus, 317, 27S (12pp). Productionized code available at `https://github.com/silburt/DeepMoon`, dataset available at `https://zenodo.org/record/1133969#.W3HtT63MzdQ`

**Silburt, A.**, Rein, H., "*Resonant structure, formation and stability of the planetary system HD155358*", 2017, MNRAS, 469, 4 (6pp)

Tamayo, D., **Silburt, A.**, et al., "*A Machine Learns to Predict the Stability of Tightly Packed Planetary Systems*", 2016, ApJL, 832, L22 (5pp)

**Silburt, A.**, Rein, H., "*Tides Alone Cannot Explain Kepler Planets Close to 2:1 MMR*", 2015, MNRAS, 453, 4089S (7pp)

**Silburt, A.**, Gaidos, E., Wu, Y., "*A Statistical Reconstruction of the Planet Population Around Kepler Solar-Type Stars*", 2015, ApJ, 790, 180S (12pp)

## RECENT SCIENTIFIC TALKS AND POSTERS

Talk: "*The Lord of the Rings – Deep Learning Craters on the Moon and other Bodies.*", American Astronomical Society Conference, 2018. Gaylord Convention Centre, Washington, D.C., USA.

Talk: "*Machine learning for predicting longterm planetary stability and crater counting on the Moon*", Penn State University Colloquium, 2017. Location: State College, PA, USA.

Talk: "*A Hybrid Integrator for Simulating Planetesimal Migration and Close Encounters*", Numerical Integration Methods in Planetary Sciences, 2017. Location: Toronto, ON, Canada.

Talk: "*The Formation and Stability of Kepler Planets*", Carnegie Institute for Science, 2016. Location: Washington D.C., USA.

Talk: "*Comparing the Formation of Kepler Systems to the Solar System*", Massachusetts Institute of Technology, 2016. Location: Boston, MA, USA.

Talk: "*Machine Learning to Predict Planet Stability*", Stars and Planets Seminar, Harvard University, 2016. Location: Boston, MA, USA.

Talk: "*Forming Planetary Systems: A Comparative Study Between the Solar System and the Kepler Population*", Princeton University's "Thunch", 2016. Location: Princeton, NJ, USA.

Talk: "*HERMES: A hybrid integrator for simulating close encounters and planetesimal migration*", Emerging Researchers in Exoplanet Science Symposium II (ERESS II), 2016. Location: Cornell University, NY, USA.

Poster: "*Tidal Forces Cannot Explain Planets Close to 2:1 Mean Motion Resonance*, Extreme Solar Systems III (ESS-III), 2015. Location: Waikoloa Beach, HI, USA.

Talk: "*Sifting Through the Noise: A Re-calculation of the Occurrence of Earth-Sized Planets around Kepler Stars*", Emerging Researchers in Exoplanet Science Symposium (ERESS), 2015. Location: University Park, PA, USA.

## MENTORING

I supervised and mentored the following student:

Christian Gilbertson, graduate student at Penn State University. 2017–2018
*Research: Machine Learning to predict orbital stability of high-N multi-planet systems.*

## TEACHING

I held the position of "Teaching Assistant" for all entries listed below, and was responsible for creating assignments, leading tutorial lectures, performing planetarium shows, conducting nighttime telescope observing sessions, marking and/or proctoring:

"*PHYB54: Mechanics: From Oscillations to Chaos* ", University of Toronto. 2017

"*PSCB 57: Intro to Scientific Computing*", University of Toronto. 2016

"*AST 251: Life on Other Worlds*", University of Toronto. 2016

"*AST 210: Great Moments in Astronomy*", University of Toronto. 2015

"*AST 101: The Sun and its Neighbours*", University of Toronto. 2012–2015

"*AST 201: Stars and Galaxies*", University of Toronto. 2013–2014

"*PHYS 1031: Stars, Galaxies and the Universe*", Mount Allison University. 2012

"*PHYS 3001: Astrophysics*", Mount Allison University. 2011

"*PHYS 3021: Life in the Universe*", Mount Allison University. 2011

"*PHYS 1021: Solar System Astronomy*", Mount Allison University. 2010

"*PHYS 1551: General Physics II*", Mount Allison University. 2010

"*PHYS 1051: General Physics I*", Mount Allison University. 2009

## SELECTED LEADERSHIP & OUTREACH

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| Invited to present "*Lunar Crater Identification via Deep Learning*" at Google I/O conference to 100 reporters. | 2018 |
| Executive Secretary on NASA's Exoplanet Review Panel (XRP) to rank science proposals for future NASA funding. | 2017 |
| "AstroTours" Public Talk: "*The Butterfly Effect: Chaos Theory and its Influence on our Lives*", University of Toronto, link: `https://www.youtube.com/watch?v=kK3Kj1sSUeg` | 2016 |
| "AstroTours" Keynote Lecture Head Organizer, University of Toronto. Invited Speaker – Fran Bagenal, University of Colorado Boulder. | 2016 |
| "AstroTours" Public Talk: "*A Conversation With Our Old Friend The Moon*", University of Toronto, link: `https://www.youtube.com/watch?v=HmCa9qN6DVA` | 2016 |
| Scientific Consultant for WJ Gastle's novel "*Mission 32 (Will Hunter Chronicles Book 1)*". | 2014–2016 |
| Planetarium Operator and Lecturer at the University of Toronto Planetarium. | 2013–2016 |
| Telescope Operator and Volunteer for the University of Toronto's "AstroTours", University of Toronto. | 2012–2016 |
| "AstroTours" Public Talk: "*Interstellar: The Science Behind the Movie*", University of Toronto, link: `https://www.youtube.com/watch?v=_mbdxCD_6rA` | 2015 |
| "AstroTours" Public Talk: "*Distant Earths*", University of Toronto link: `https://www.youtube.com/watch?v=mLYzxB8VjQY` | 2013 |
| Astronomy Society Executive Member, Mount Allison University. | 2010–2012 |
| Telescope Operator for Public Tours and Science Labs, Mount Allison University. | 2009–2012 |