Alysa Obertas

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Canadian Institute for Theoretical Astrophysics
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OVERVIEW

PhD Candidate, NSERC Alexander Graham Bell Scholar (CGSD)

I investigate the orbital dynamics of compact planetary systems. The Kepler telescope discovered hundreds of multi-planet systems, but astronomers have an incomplete understanding of how they formed and have changed over billions of years. I do theoretical work studying the long-term evolution of compact systems to learn how observed systems have been dynamically sculpted to their present-day architectures.

EDUCATION

PhD Astronomy & Astrophysics 2015-present
Department of Astronomy & Astrophysics, University of Toronto
Dynamical Sculpting of Compact Planetary Systems
Thesis supervisor: Professor N. Murray (Canadian Institute for Theoretical Astrophysics)

Non-degree Studies 2014-2015
University of British Columbia
Courses in planetary science, astronomy, and applied mathematics

BSc Combined Honours in Physics and Astronomy 2009-2014
University of British Columbia
with Distinction, Co-operative Education Program
Searching for Evidence of White Dwarf Core Crystallization in the Globular Cluster 47 Tucanae
Thesis supervisors: Professor H. Richer and Professor J. Heyl

PEER-REVIEWED JOURNAL PAPERS [ADS][arXiv]

3. A. Obertas, I. Caiazzo, J. Heyl, H. Richer, J. Kalirai, and P.-E. Tremblay, "The onset of convective coupling and freezing in the white dwarfs of 47 Tucanae", *MNRAS* **474, 1, 11**, 677-682 (2018).

2. A. Obertas, C. Van Laerhoven, and D. Tamayo, "The stability of tightly-packed, evenly-spaced systems of Earth-mass planets orbiting a Sun-like star", *Icarus* **293**, 52-28 (2017).

1. D. Tamayo, A. Silburt, D. Valencia, K. Menou, M. Ali-Dib, C. Petrovich, C. X. Huang, H. Rein, C. van Laerhoven, A. Paradise, A. Obertas, and N. Murray, "A Machine Learns to Predict the Stability of Tightly Packed Planetary Systems", *ApJL* **832**, L22 (2016).

RESEARCH EXPERIENCE

Research Assistant in Exoplanets and Orbital Dynamics 2016-present
Department of Astronomy & Astrophysics, CITA
Supervisor: Professor N. Murray

Research Assistant in Exoplanet Atmospheres (AST1500) 2016
Department of Astronomy & Astrophysics, Centre for Planetary Sciences
Supervisor: Professor K. Menou

Research Assistant in Exoplanets and Orbital Dynamics (AST1501) 2015-2016
Department of Astronomy & Astrophysics, CITA
Supervisors: Dr. C. Van Laerhoven and Professor N. Murray

Research Assistant in MESSENGER Magnetic Field Studies 2014-2015
Department of Earth, Ocean and Atmospheric Sciences
Supervisor: Professor C. Johnson

Research Assistant in White Dwarf Physics 2014
Department of Physics & Astronomy
Supervisor: Professor J. Heyl

Research Assistant in Globular Clusters & White Dwarfs (AST449) 2013-2014
Department of Physics & Astronomy
Supervisors: Professor H. Richer and Professor J. Heyl

Francium Atom Trap Student Assistant (co-op) 2013
TRIUMF
Supervisors: Dr. J. Behr and Dr. M. Tandecki

Researcher in Theoretical Nuclear Physics (co-op) 2012
TRIUMF
Supervisor: Dr. P. Navratil

AWARDS AND FELLOWSHIPS

Alexander Graham Bell Canada Graduate Scholarship Doctoral 2018-present
University of Toronto

Queen Elizabeth II Graduate Scholarships in Science & Technology 2016-2017
University of Toronto

Centre for Planetary Sciences Graduate Fellow 2015-2017
University of Toronto

NSERC Canada Graduate Scholarship Master's 2015
University of Toronto

NSERC Undergraduate Student Research Award 2014
University of British Columbia

Dean's Honour List 2009-2014
University of British Columbia

Paul Sykes Scholarship in Astronomy 2013
University of British Columbia

Bruce Marshall Prize 2012
University of British Columbia

J Fred Muir Memorial Scholarship in Science 2012
University of British Columbia

President's Entrance Scholarship 2009
University of British Columbia

TALKS AND SEMINARS

6. *The Kirkwood Gaps*, Blackboard Talks, CITA, 13/1/19

5. *Stability and survival of tightly-packed planetary systems*, CPSX Research Forum, Western University, 21/9/18 (invited)

4. *The standard map: a tool for exploring resonance and chaos in orbital dynamics*, Blackboard Talks, CITA, 26/6/18

3. *Using the Standard Map to Understand Resonance and Chaos in Orbital Dynamics*, CPS Planet Lunches, University of Toronto Scarborough, 19/6/18

2. *Stability of tightly-packed multi-planet systems*, Stars & Planets Discussion, University of Toronto, 16/2/18

1. *The Stability of Tightly-packed and Evenly-spaced Planetary Systems*, Stars & Planets Discussion, University of Toronto, 15/4/16

CONFERENCES

7. *Dynamical Sculpting of Compact Planetary Systems*, Women in Space, Scottsdale, Arizona, 2/19 (oral presentation)

6. *The Stability and Limits of Tightly-packed Exoplanet Systems*, CASCA Annual Meeting, Victoria, British Columbia, 5/18 (poster presentation)

5. *The stability of tightly-packed and evenly-spaced planetary system*, AAS Division on Dynamical Astronomy Annual Meeting, Nashville, Tennessee, 5/16 (oral presentation)
4. *Searching for Evidence of White Dwarf Core Crystallization in 47 Tucanae*, Annual Meeting of the Northwest Section of the APS, Seattle, Washington, 5/14 (poster presentation)
3. Conference for Undergraduate Women in Physics, Salt Lake City, Utah, 1/14
2. *Establishing a relative frequency standard for trapping francium*, CAP Congress, Montreal, Quebec, 5/12 (poster presentation)
1. *Analysis of Scattering Techniques for Nuclear Reaction Theory*, Canadian Undergraduate Physics Conference, Vancouver, British Columbia, 10/12 (oral presentation)

TEACHING EXPERIENCE AND TRAINING

Graduate Teaching Assistant, *Department of Physical & Environmental Sciences, University of Toronto Scarborough*

- **PHYD38 Nonlinear Systems and Chaos**: Winter 2019

Graduate Teaching Assistant, *Department of Astronomy & Astrophysics, University of Toronto*

- **AST251 Life on Other Worlds**: Winter 2019
- **AST221 Stars and Planets**: Fall 2018
- **AST201 Stars and Galaxies**: Summer 2018, Winter 2018*, Winter 2017*, Winter 2016
- **AST101 The Sun and Its Neighbours**: Fall 2017*, Fall 2016*, Fall 2015

  * lead tutorial TA

Co-instructor, *Astro Workshop for Ontario Teachers, York University*

- **Transiting Exoplanets Inquiry Activity**: August 2018

Co-instructor, *Instrumentation Summer School, Dunlap Institute for Astronomy & Astrophysics, University of Toronto*

- **Optical Design Lab**: August 2016

Professional Development Program, *Institute for Scientist & Engineer Educators, UC Santa Cruz*

- **Inquiry Institute**: March 2016
- **Design Institute**: April 2016

Undergraduate Teaching Assistant, *Department of Computer Science, University of British Columbia*

- **APSC160 Introduction to Computation in Engineering Design**: Winter 2014 Term 1
- **CPSC189 Systematic Program Design in Python**: Winter 2013 Term 2
- **CPSC110 Computation, Programs, and Programming**: Winter 2013 Term 1, Winter 2013 Term 2

MENTORING

Taylor Kutra 2018-present
Peer Mentoring Programme, Graduate Astronomy Student Association

Emily Deibert 2017-2018
Peer Mentoring Programme, Graduate Astronomy Student Association

SELECTED OUTREACH EXPERIENCE AND ACTIVITIES

Planetarium Developer 2018-present
University of Toronto Planetarium, Dunlap Institute for Astronomy & Astrophysics

Co-Director 2017-present
University of Toronto AstroTours

Planetarium Presenter 2016-present
University of Toronto Planetarium, Dunlap Institute for Astronomy & Astrophysics

Guest Astronomer 2019
Centre for Planetary Sciences Fireside Chat

MC, 16th Annual Symposium 2019
Astronomy & Space Exploration Society (invited)

Scientist 2018
Skype a Scientist

Planetarium Presenter 2016
Mystical Landscapes, Department of Astronomy & Astrophysics and Art Gallery of Ontario

Planetarium Director 2015-2017
University of Toronto AstroTours

Outreach Support Scientist 2016
Dunlap Institute for Astronomy & Astrophysics

Promotions Lead and **Planetarium Presenter** 2015-2016
Astronomy's Golden Age: Planetarium Shows in Aid of Syrian Refugees, University of Toronto

Outreach Assistant 2012
Department of Physics & Astronomy, University of British Columbia

Astronomy Interpreter (co-op) 2011
Centre of the Universe, NRC Herzberg Institute of Astrophysics

PUBLIC TALKS

5. *Kepler's Story*, University of Toronto AstroTours, 3/7/19
4. *Why Pluto Still Matters*, Astronomy on Tap Toronto, Dunlap Institute for Astronomy & Astrophysics, 17/8/18 (invited)
3. *Nature's Desctructive Fury*, Science Literacy Week, Toronto Public Library, Hillcrest, 19/9/17 (invited)
2. *Nature, Destroyer of Worlds*, University of Toronto AstroTours, 2/3/17
1. *Where did the Moon come from?*, North York Astronomical Association, 12/1/17 (invited)

SERVICE

Mediation Committee 2019-present
Graduate Astronomy Students Association, University of Toronto

Manuscript Referee 2017-present
Astronomical Journal, Monthly Notices of the Royal Astronomical Society

Mediation Committee 2017-2018
Graduate Astronomy Students Association, University of Toronto

Hogg Visitorship Committee 2016
Department of Astronomy & Astrophysics, University of Toronto

Summer Undergraduate Research Program Committee 2016
University of Toronto

Grievance Committee 2015-2016
Graduate Astronomy Students Association, University of Toronto