

J. J. Zanazzi

THEORETICAL ASTROPHYSICIST · PHD · U.S. CITIZEN · CURRICULUM VITAE

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Education

Cornell University, Dept. of Astronomy

PHD IN THEORETICAL ASTROPHYSICS, ADVISOR PROF. DONG LAI

Ithaca, NY, USA
Sept. 2013 - Aug. 2018

Northern Arizona University

MERGED B.S. IN PHYSICS & ASTRONOMY
B.S. IN MATHEMATICS

Flagstaff, AZ, USA
Sept. 2009 - May 2013

Semester-Long Mathematics Programs

MATH IN MOSCOW PROGRAM, INDEPENDENT UNIV. OF MOSCOW, MOSCOW, RU
MATHEMATICS ADVANCED STUDY SEMESTERS (MASS), PENN. STATE UNIV., STATE COLLEGE, PA, USA

Jan. 2013-May 2013
Sept. 2011-Dec. 2011

Positions

Dept. of Astronomy, Univ. of California Berkeley

51 PEGASI B POSTDOCTORAL FELLOW

Berkeley, CA, USA
Sept. 2022-PRESENT

Canadian Institute for Theoretical Astrophysics (CITA), Univ. of Toronto

RESEARCH ASSOCIATE
POSTDOCTORAL FELLOW

Toronto, ON, CA
Sept. 2021 - Aug. 2022
Sept. 2018 - Aug. 2021

Dept. of Applied Mathematics and Theoretical Physics (DAMTP), Univ. of Cambridge

DAVID CRIGHTON VISITING POSTDOCTORAL FELLOW

Cambridge, UK
Sept. 2019 - Nov. 2019

Dept. of Astronomy, Cornell Univ.

GRADUATE RESEARCH ASSISTANT

Ithaca, NY, USA
Sept. 2015 - Aug. 2018

Research Highlights

- Successful prediction of polar-aligned protoplanetary disks (Zanazzi & Lai 2018a; Kennedy et al. 2019, NatAs; Czekala et al. 2019)
- Prediction of primordial spin-orbit misalignment suppression for short-period planets with binary companions (Zanazzi & Lai 2018c; Montet et al. 2020; Hjorth et al. 2021, PNAS)
- Precessing magnetars explain periodic fast radio bursts (Zanazzi & Lai 2020, ApJL; Li & Zanazzi 2021, ApJL; Zhang 2020, Nature)
- Stellar binaries show signatures of circularization via resonance locking during the pre-main sequence (Zanazzi & Wu 2021; Zanazzi 2021)
- Eccentric accretion disks can power optically-bright Tidal Disruption Events (Zanazzi & Ogilvie 2020)

Honors & Awards

POSTGRADUATE

- | | | |
|------|---|---------------------------|
| 2022 | 51 Pegasi b Postdoctoral Fellowship , Prize fellowship to fund research at UC Berkeley | <i>Heising-Simons Fdn</i> |
| 2019 | David Crighton Fellowship , 2-3 month postgraduate grant to work at DAMTP | <i>Univ. of Cambridge</i> |
| 2017 | Eleanor York Prize , Recognition for academic achievement and service | <i>Cornell Univ.</i> |
| 2015 | Earth and Space Science Graduate Fellowship , Funded 3 years of graduate research at Cornell | <i>NASA</i> |

UNDERGRADUATE

- | | | |
|------|---|-----------------------|
| 2013 | Math in Moscow Scholarship , Funded study-abroad semester at Ind. Univ. of Moscow | <i>AMS/NSF</i> |
| 2012 | Honorable Mention , New Frontiers in Astronomy and Cosmology Student Essay Competition | <i>Templeton Fdn.</i> |
| 2011 | MASS Fellowship , Funded Mathematics Advanced Study Semesters (MASS) program | <i>Penn State/NSF</i> |
| 2009 | NAU/NASA Space Grant , Funded undergraduate exoplanetary research | <i>AZ Space Grant</i> |

NAU Institutional Scholarships

- Arthur and Catherine B. Adel Scholarship Fund, Physics Dept., 2012
- Karen and Terrence Hall Scholarship, Math Dept., 2012
- Chair's Scholar, Physics Dept., 2011, 2010
- Alumni Scholarship, NAU, 2010

PODCAST INTERVIEWS

Earth News Interviews, *Protoplanetary Disks and Backwards-Spinning Stars*, Univ. of Toronto

Apr. 4, 2021

ARTICLES

astrobit.es, *A Star Askew: A Potential Cause of the Misalignment of a Star and its Planets*, Ali Crisp

Apr. 13, 2021

***Aarhus Univ.**, *A backward-spinning star with two coplanar orbiting planets in a multi stellar system*, Ole Knudsen

Feb. 25, 2021

New Scientist, *We have spotted two planets orbiting a backwards-spinning star*, Krista Charles

Feb. 15, 2021

***Subaru Telescope**, *Flipped-Over Exoplanets Prove New Disk-Tilt Mechanism*

Feb. 15, 2021

***Telescopio Nazionale Galileo**, *Two backward orbiting exoplanets in a triple star system prove protoplanetary disk-tilt mechanism*

Feb. 15, 2021

***CITA**, *Planetary system with a star that rotates backwards*

Feb. 15, 2021

AAS Nova, *An Update on the Mysterious Flashes of FRB 180916*, Susanna Kohler

July 8, 2020

Nature, *Unexpected emission pattern adds to the enigma of fast radio bursts*, Bing Zhang

June 17, 2020

Inside Science, *How Plate Tectonics Could Make Rocky Planets Hospitable to Life*, Ramin Skibba

Feb. 27, 2019

MEDIA COMMENTARY

AGU Eos, *Peculiar Planets Prefer Perpendicular Paths*, Kimberly Cartier

July 29, 2021

Oral Presentations

*Virtual (via Zoom)

INVITED

***Northwestern University**, CIERA Science Happy Hour

Jan. 14, 2022

***University of California Berkeley**, Center for Integrative Planetary Science Seminar

Sept. 29, 2021

***University of Victoria**, Canada Planet Discussion Day Conference

June 10, 2021

***Cornell University**, Theoretical Astrophysics Seminar

Apr. 6, 2021

***Heidelberg University**, Prof. Kees Dullemond Group Meeting

Apr. 1, 2021

***Harvard University**, Prof. Ramesh Narayan Group Meeting

Feb. 24, 2021

***KU Leuven**, Institute for Astronomy Seminar

Feb. 19, 2021

***Princeton University**, Prof. Josh Winn Group Meeting

Nov. 23, 2020

***University of Cambridge**, X-ray Astronomy Group Meeting

May 19, 2020

University of California Berkeley, Theoretical Astrophysics Center Seminar

Dec. 2, 2019

Aarhus University, Stellar Astrophysics Center Seminar

Nov. 6, 2019

University of Warwick, Astronomy Seminar

Oct. 23, 2019

University of Cambridge, DAMTP Astrophysical Fluid Dynamics Seminar

Oct. 14, 2019

Tsung-Dao Lee Institute, Astrophysical Dynamics Conference

July 8, 2019

Shanghai, China, Exoplanets and Planet Formation Conference

Dec. 12, 2018

CONTRIBUTED

***Canadian Institute for Theoretical Astrophysics**, CITA Seminar

Sept. 23, 2021

***California Institute of Technology**, Prof. Jim Fuller Group Meeting

June 03, 2021

***Division of Dynamical Astronomy (DDA)**, DDA Annual Meeting

May 18, 2021

***University of Cambridge**, Distorted Astrophysical Disks: Insights and Future Directions Conference

May 17, 2021

***Canadian Institute for Theoretical Astrophysics**, CITA Seminar

June 8, 2020

Kyoto University, Tidal Disruption Events: General Relativistic Transients Workshop

Jan. 21, 2020

Kyoto University, Tidal Disruptions in Kyoto: Confronting Theory with Observations Conference

Jan. 14, 2020

Center for Computational Astrophysics, Compact Objects Group Meeting

Sept. 19, 2019

Max Planck Institute Heidelberg, Planetary Dynamics Conference

June 4, 2019

Center for Computational Astrophysics, Planet Formation Workshop

May 23, 2019

AAS Winter Meeting, Seattle, WA, USA

Jan. 8, 2019

California Institute of Technology, Yuk Lunch Seminar

Feb. 21, 2018

University of California Santa Cruz, Other Worlds Laboratory Seminar

June 28, 2017

Yale University, Emerging Researchers in Exoplanet Science III Conference

June 12, 2017

Paris Observatory, Dynamics Seminar

May 23, 2017

University of Cambridge, Exoplanetary Meetings

May 18, 2017

Aspen Center for Physics, Formation and Dynamical Evolution of Exoplanetary Systems Winter Conference

Mar. 30, 2017

Cornell University, Emerging Researchers in Exoplanet Science II Conference

June 14, 2016

Joint Mathematics Meetings, Annual Joint Mathematics Meeting, San Diego, CA, USA

Jan. 12, 2013

Northern Arizona University, Algebra, Combinatorics, Geometry, and Topology Seminar

Sept. 25, 2012

Advising Experience

SCIENTIFIC

Kanah Smith, CITA SURP Aurora Borealis Fellow

LEAD CO-ADVISOR WITH DR. JANOSZ DEWBERRY

- Project: The effect of tidal dissipation on circumbinary planet stability, *in progress*

Univ. of Toronto
May 2020-PRESENT

Niharika Namulla, CITA SURP Fellow

LEAD CO-ADVISOR WITH DR. JANOSZ DEWBERRY

- Project: Using survival analysis to study the stability of circumbinary planets, *in progress*

Univ. of Toronto
May 2020-PRESENT

Dongzi Li, CITA Graduate Student

COLLABORATOR, PHD ADVISOR PROF. UE-LI PEN

- Project: Polarization of FRBs from precessing magnetars, *student lead-author publ. in ApJL*

Univ. of Toronto
May 2020-Feb. 2021

Michael Poon, CPS, SURP, and McGill Undergraduate Research Fellow

LEAD ADVISOR

- Project 3: Planetary Obliquities in the HR 8799 planetary system *in progress*
- Project 2: Inertial wave dissipation efficiency constrains using stellar obliquities in hot Jupiter systems, *student lead-author publ. in-prep.*
- Project 1: Constraining the circumbinary disk tilt in the KH 15D system, *student lead-author publ. in MNRAS*

Univ. of Toronto
June 2019-Oct. 2021

Jessica Speedie, NSERC USRA SURP Fellow

LEAD ADVISOR

- Project: The structure and stability of inclined, circumplanetary disk or ring systems, *lead-author publ. in MNRAS*

Univ. of Toronto
May 2019-Sept. 2019

PROFESSIONAL

Dunlap Institute Postdoc-Student Mentorship program

PROFESSIONAL ADVISE TO UNIV. OF TORONTO ASTRONOMY GRADUATE STUDENTS

- Students: Adaeze Ibik, Jennifer Scora

Toronto, CA
May 2020-current

Girls SySTEM Mentorship program

PROFESSIONAL ADVISE FOR FEMALE HIGH-SCHOOL STUDENTS INTERESTED IN A STEM CAREER, IN THE GREATER TORONTO AREA

- Students: Bernadette Tolentino

Toronto, CA
May 2020-June 2020

Teaching Experience

TEACHING ASSISTANT

“The History of the Universe,” Writing in the Disciplines Course (Astro 2201)

TEACHING ASSISTANT

TEACHING ASSISTANT

Duties: Give guest lectures, assist in design of essay prompts, grade essays written by students.

Cornell Univ.
Spring 2015
Fall 2013

“The History of the Universe” (Astro 1101)

TEACHING ASSISTANT

Duties: Give weekly break-out session lectures to two groups of ~10 students, grade problem sets

Cornell Univ.
Fall 2014

“Relativity and Astrophysics” Massively on-line open course (Astro 2290x)

TEACHING ASSISTANT

Duties: assist designing on-line problem sets, answer questions of $\geq 10,000$ students on course chat boards

Cornell Univ.
Spring 2014

UNDERGRADUATE WORKSHOPS

“How to Write an Abstract”, SURP Professional Development Workshop Series

INSTRUCTOR & ORGANIZER

INSTRUCTOR & ORGANIZER

Hands-on workshop, which included asking undergrad research students to write an abstract on their current projects.

Univ. of Toronto
July 23, 2019
June 16, 2020

Workshop on Gravitation and Pulsars

ASSISTANT INSTRUCTOR

Assisted running a workshop teaching pulsar timing data-analysis techniques to undergraduate researchers.

Cornell Univ.
July 19, 2016

Physics GRE Workshop

INSTRUCTOR & ORGANIZER

Organized and lead workshop on test preparation for Physics GRE, aimed at visiting Undergraduate Research Assistants.

Cornell Univ.
June 30, 2016

GUEST LECTURES

Guest Lecturer, Astro 101 SURP Lecture Series

LECTURE: *Orbital Dynamics and Tidal Evolution in Stellar and Planetary/Exoplanetary Systems*
LECTURE: *Orbital Dynamics and Tidal Evolution in Stellar and Planetary/Exoplanetary Systems*

Univ. of Toronto
June 3, 2020
June 1, 2019

Guest Lecturer, Introduction to Astrophysics (AST 320)

LECTURE: *How to Build a Star/Planet*

Univ. of Toronto
Dec. 13, 2019

CITA Blackboard Talks

LECTURE: *The Structure and Dynamics of Warped Accretion Disks*
LECTURE: *How Dust Scattering can hide Mass in ALMA Protoplanetary Disks*
LECTURE: *Optical Emission from Tidal Disruption Events of Stars around Supermassive Black Holes*
LECTURE: *Magnetic Interactions between Protoplanetary Disks and their Spinning Host Stars*

Univ. of Toronto
Oct. 16, 2018
Apr. 30, 2019
Nov. 19, 2019
Mar. 31, 2020

TUTORING

Academic Success Center

PHYSICS & MATHEMATICS UNDERGRADUATE TUTOR

Duties: One-on-one tutoring of undergraduate students for Physics and Mathematics courses. Worked 10 hours/week.

Northern Arizona Univ.
Oct. 2010-Mar. 2011

Observing Proposals

CO-INVESTIGATOR

ESO DDT Proposal

PI PROF. SIMON ALBRECHT, OBTAINED 6.3 HOURS ON EXPRESSO

• Title: *A multi-transiting planet system with a retrograde orbiting planet: testing coplanarity and primordial disk misalignment*

June 9, 2019

Service

Astronomy Anti-Racism Committee, University of Toronto

Conference Co-organizer, Canada Planet Discussion Day

Summer Undergraduate Research Program (SURP) Committee, University of Toronto

Blackboard Talk Committee, Canadian Institute for Theoretical Astrophysics

Panel Reviewer, NSF Astronomy & Astrophysics Program

Panel Reviewer, NASA Exoplanets Research Program

Panel Reviewer, NASA Theoretical Astrophysics Program

External Reviewer, UKRI STFC DiRAC HPC Proposal

Executive Secretary, NASA Exoplanetary Formation and Dynamics Program

SURP Poster Judge, University of Toronto

Colloquium Representative, Astronomy Graduate Network, Cornell University

Referee, MNRAS, ApJL, ApJ, A&A, PSJ

Fall 2021-PRESENT
Summer 2021
Summer 2020
Fall 2019-PRESENT

Summer 2019- Summer 2021
Spring 2018

Outreach

Fayetteville Free Library Geek Girl Camp

ACTIVITY COORDINATOR: NASA'S EDIBLE ROCKS

Lead activity teaching meteor classification to middle school science camp for girls.

Cornell Univ.
July 2018

Fuertes Observatory Solar Eclipse Viewing

ACTIVITY ASSISTANT: ECLIPSE VIEWING

Handed out glasses and set up telescopes to safely view the great American eclipse for a few thousand visitors.

Cornell Univ.
July 2018

4-H Focus for Teens Career Explorations

ACTIVITY ORGANIZER: SUPERNOVAE WORKSHOP

Lead workshop on supernovae and nucleosynthesis for sixth grade students (once per year).

Cornell Univ.
June 2014-June 2016

Southside Community Center

OUTREACH VISIT, ASSISTANT ROLE

Afternoon visit, doing astronomy-themed educational activities for underprivileged elementary school children.

Ithaca, NY
Sept. 2014

Career Day

POPULAR ASTRONOMY LECTURE

Gave talk about neutron stars to visiting sixth grade students (once per year).

Cornell Univ.
June 2014-June 2015

Museum in the Dark, Museum of the Earth

SPANDEX-UNIVERSE DEMO COORDINATOR

Manned "The Spandex Universe" demo, explaining relativity to the general public (once per year).

Ithaca, NY
Oct. 2013-Oct. 2015

Science Communication Training

ComSciCon-Cornell

WORKSHOP PARTICIPANT

Participated in week-long science communication workshop for graduate students and post-docs

Cornell Univ.

May 21-29 2015

References

Eugene Chiang

PROFESSOR, DEPT. OF ASTRONOMY AND EARTH & PLANETARY SCIENCE, UNIV. OF CALIFORNIA BERKELEY

Address: Astronomy Department, 501 Campbell Hall #3411, Berkeley CA 94720-3411

Phone: (510)701-5996

Email: echiang@astro.berkeley.edu

Norman Murray

PROFESSOR, CANADIAN INSTITUTE FOR THEORETICAL ASTROPHYSICS, UNIV. OF TORONTO

Address: McLennan Physical Laboratories, Room 1404D, 60 St. George Street, Toronto Ontario M5S 3H8

Phone: 416-978-1778

Email: murray@cita.utoronto.ca

Gordon Ogilvie

PROFESSOR, DEPT. OF MATHEMATICS AND THEORETICAL PHYSICS, UNIV. OF CAMBRIDGE

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Phone: +44-(0)1223-760395

Email: gio10@cam.ac.uk

Dong Lai

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Phone: 607-255-4936

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