Ryan Dungee

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CONTACT INFORMATION

Dunlap Institute for Astronomy & Astrophysics
50 St. George Street, #228
Toronto, ON, Canada M5S 3H4

E-mail: ryan.dungee@utoronto.ca
Website: rdungee.github.io

RECENT EMPLOYMENT

Dunlap Fellow Jan. 2023–Present

Postdoctoral fellow at the Dunlap Institute for Astronomy & Astrophysics, working as an independent researcher on tomographic adaptive optics and turbulence profiling instrumentation. Currently developing new machine learning techniques for tomographic wavefront reconstruction, as well as designing and building a scintillation detection and ranging device bound for Maunakea.

EDUCATION

University of Hawaii, Honolulu, Hawaii, USA Aug. 2016– Nov. 2022

- Ph.D. in Astronomy, Fall 2022
- M.S. in Astronomy, Spring 2018
- Thesis: Spinning Red Clocks in Crowded Fields: Toward a Better Understanding of M Dwarf Spin Down

University of Pennsylvania, Philadelphia, Pennsylvania, USA Aug. 2011–May 2016

- M.S. in Physics, Spring 2016
- B.A. in Physics, Fall 2015

HONORS AND AWARDS

- Friends of the IfA Research Award (2017, 2018)
- Columbia Communications ARCS Award in Astronomy (2021)

PUBLICATIONS

First Author Publications

1. **Dungee, Ryan**; Chun, Mark. *"Temporal tomography: a new approach to tomographic adaptive optics"* *2024, SPIE, 13097, 130977M*
2. **Dungee, Ryan**; van Saders, Jennifer; Gaidos, Eric; and 5 coauthors. *"A 4 Gyr M-dwarf Gyrochrone from CFHT/MegaPrime Monitoring of the Open Cluster M67"* *2022, ApJ, 938, 2, 118*
3. **Dungee, Ryan**; Chun, Mark. *"Characterizing atmospheric turbulence over Maunakea through temporal tomography"* *2022, SPIE, 12185, 121851P*
4. **Dungee, Ryan**; Chun, Mark; Hayano Yutaka. *"On the feasibility of using a laser guide star adaptive optics system in the daytime"* *2019, JATIS, 5, 019002*
5. **Dungee, Ryan**; Boogert, Adwin; DeWitt, Curtis N. and 10 coauthors. *"High-resolution SOFIA/EXES Spectroscopy of SO_2 Gas in the Massive Young Stellar Object MonR2 IRS3: Implications for the Sulfur Budget"* *2018, ApJL, 868, L10*

Contributing Author Publications

1. Khandelwal, Aditya; Jeram, Sarik; **Dungee, Ryan** and 7 coauthors. *"Beyond CCDs: characterization of sCMOS detectors for optical astronomy"* *2024, SPIE, 13103, 131030R*
2. Gaidos, Eric; Claytor, Zachary; **Dungee, Ryan** and 2 coauthors. *"The TIME Table: rotation and ages of cool exoplanet host stars"* *2023, MNRAS, 520, 4, 5283-5304*
3. Chun, Mark R.; Ryan, Alan; Zhang, Ruihan and 20 coauthors. *"Progress on the University of Hawaii 2.2-meter adaptive secondary mirror"* *2022, SPIE, 12185, 121857U*
4. McEwen, Eden A.; **Dungee, Ryan**; Chun, Mark. *"Wavefront profiling via correlation of GLAO open loop telemetry"* *2022, SPIE, 12185, 121855U*

5. Lai, Olivier; Chun, Mark; **Dungee, Ryan** and 2 coauthors. *"DO-CRIME: dynamic on-sky covariance random interaction matrix evalutation, a novel method for calibrating adaptive optics systems" 2021, MNRAS, 501, 3443-3456*

6. Barr, Andrew G.; Boogert, Adwin; DeWitt, Curtis N. and 8 coauthors. *"Infrared Detection of Abundant CS in the Hot Core AFGL 2591 at High Spectral Resolution with SOFIA/EXES" 2018, ApJL, 868, L2*

Talks

Invited Talks

1. **Abundant SO_2 Gas in the Hot Core around MonR2 IRS3**
   SOFIA Tele-talk Series. April 17, 2019

2. **Turbulence Profiling on Maunakea: past, present, and future.**
   NRC-HAA DAO Virtual Colloquium. November 5, 2024 (Expected)

Contributed Talks

1. **One Turbulent Night: A Thorough Look at Temporal Tomography**
   Communications and Observations through Atmospheric Turbulence 2023. March 30, 2023
   Adaptive Optics for Extremely Large Telescopes 7. June 30, 2023

2. **Characterizing Atmospheric Turbulence over Maunakea through Temporal Tomography**
   SPIE Astronomical Telescopes + Instrumentation. July 20, 2022

3. **A 4-Gyr M Dwarf Gyrochrone from CFHT/MegaPrime Monitoring of the Open Cluster M67**
   50 Years of the Skumanich Relationship. March, 10, 2021

Proposals

1. Canada France Hawaii Telescope 2023A, PI: E. Gaidos, "Extending Gyrochronology to the End of the Main Sequence," awarded 20 hours

2. Canada France Hawaii Telescope 2022B, PI: van Saders, "Old Clusters for a New Spin on M Dwarf Gyrochronology," awarded 15 hours

3. Canada France Hawaii Telescope 2021B, PI: **R. Dungee**, "Old Clusters for a New Spin on M Dwarf Gyrochronology," awarded 15 hours.

4. Canada France Hawaii Telescope 2020A, 2020B, 2021A, PI: van Saders, "Old Clusters for a New Spin on M Dwarf Gyrochronology," awarded 15 hours each (45 total).

Observing Experience

UH 2.2m, 'imaka Groud Layer Adaptive Optics System (wide-field imager). Approximately 480 hours in total.

Software Skills

Mastery

- Linux, Windows, Python (`pytorch`, `numpy`, `scipy`, `matplotlib`, `astropy`, `cupy`, `poppy`, `photutils`), LaTeX, Git

Familiarity

- Julia, MacOS, C, C++, Fortran (77 and 90), Java, IDL, Bash, zsh, `TensorFlow`, `PyMC3`, `emcee`

Teaching Experience

Instructor, Dunlap Institute Summer School, University of Toronto

- Wavefront Sensing Lab (Advanced Astronomy Undergrads) Summer 2023

Instructor, Department of Physics and Astronomy, University of Hawaii

- Astronomy Lab (General Education/Non-majors) Spring 2018

Teaching Assistant, Department of Physics and Astronomy, University of Hawaii

- Astronomy Lab (General Education/Non-majors) Fall 2016, Spring 2017, Fall 2017

- Introduction to Astrophysics I (Lower Division Astrophysics Majors), Fall 2016
- Introduction to Astrophysics II (Lower Division Astrophysics Majors), Spring 2017
- Evolution of the Universe (General Education/Non-majors), Fall 2017

Teaching Assistant, Department of Earth and Environmental Science, University of Pennsylvania

- Oceanic and Atmospheric Dynamics (Upper Division Earth Science Majors), Fall 2013, Fall 2014, Fall 2015

Outreach

Astronomy on Tap – Fall 2023, Spring 2024

- A large public event, my contributions include walking around the audience during the downtime and answering astronomy related questions that they have.

Toronto Public Library Eclipse Workshops – Winter/Spring 2024

- Ran five workshops at various libraries in the greater Toronto area that instructed the public on safe eclipse viewing, as well as education about what eclipses are and why they happen.

Astroday – Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019

- A large public event, my contributions include working booths for the day as well as running on stage demonstrations in front of a large audience

IfA Open House – Spring 2018, Spring 2019

- A large public event, my contributions include working booths for the day

HISTAR – Summer 2020

- Designed and implemented a week long project on measuring the photometry for an open cluster and using it to determine an age of the stars, then successfully mentored a small group of high school students through the project

Akamai Internship Program – Summer 2019

- Contributed to the creation and teaching of a day long workshop on adaptive optics for undergraduates from Hawaii

Certificates

Adaptive Optics Summer School – Summer 2018

- A five day introductory workshop covering a wide range of topics in adaptive optics

Professional Development Program – Summer 2019

- A workshop on developing STEM education and mentorship skills, with a focus on inclusivity and the promotion of diversity in science

Nvidia Deep Learning Institute – Winter 2020

- A seminar on deep neural networks and their application in computer vision