RYAN JAMES TURNER

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Centre for Astrophysics & Supercomputing (CAS)
Swinburne University of Technology, 3122, VIC, Australia

Professional Experience

Postdoctoral Research Associate — Melbourne, Australia
Swinburne University of Technology — *36 months funding (Feb. 2023 – Feb. 2026)*

Education

PhD in Astrophysics — Melbourne, Australia
Swinburne University of Technology — *Apr. 2019 – Nov. 2022*

- Thesis: *Probing cosmological growth and expansion with the peculiar velocity field*
- Supervisors: Prof Chris Blake, Dr Rossana Ruggeri

MSc in Physics (Astronomy & Astrophysics) with Distinction — Perth, Australia
University of Western Australia (UWA) — *Feb. 2017 – Jul. 2018*

- Thesis: *Detecting Low Surface Brightness Galaxies in Deep Data and Calculating Their Contribution to the Stellar Mass Density of the Universe*
- Supervisors: Prof Simon Driver, A/Prof Aaron Robotham, Dr Luke Davies

Bachelor of Science in Physics — Perth, Australia
University of Western Australia — *Feb. 2013 – Dec. 2016*

Publications

1. **Turner, R. J.**, *Cosmology with Peculiar Velocity Surveys*, arXiv pre-print (2024), https://arxiv.org/abs/2411.19484
2. Blake, C., **Turner, R. J.**, *Forecasting the accuracy of velocity-field reconstruction*, OJA 7, 87 (2024), https://arxiv.org/abs/2408.05660
3. Lyall, S., Blake, C., **Turner, R. J.**, *Constraining modified gravity scenarios with the 6dFGS and SDSS peculiar velocity data sets*, MNRAS 532, 3972 (2024), https://arxiv.org/abs/2407.18684
4. Blake, C., **Turner, R. J.**, *On the correlations of galaxy peculiar velocities and their covariance*, MNRAS 527, 501 (2024), https://arxiv.org/abs/2308.15735
5. **Turner, R. J.**, Blake, C., *Biases in velocity reconstruction: investigating the effects on growth rate and expansion measurements in the local universe*, MNRAS 526, 337 (2023), https://arxiv.org/abs/2306.16664
6. Lyall, S., Blake, C. **Turner R. J.**, Ruggeri, R., *Testing modified gravity scenarios with direct peculiar velocities*, MNRAS 518, 5929 (2023), https://arxiv.org/abs/2211.07101
7. **Turner, R. J.**, Blake, C., Ruggeri, R., *A local measurement of the growth rate from peculiar velocities and galaxy clustering correlations in the 6dF Galaxy Survey*, MNRAS 518, 2436 (2023), https://arxiv.org/abs/2207.03707
8. Driver, S. P., Bellstedt, S., Robotham, A. S. G., Baldry, I. K., Davies, L. J., Hashemizadeh, A., Koushan, S., ... , **Turner, R. J.**, ... , Wilkins, S. W., *Galaxy And Mass Assembly (GAMA): Data Release 4 and the $z < 0.1$ total and $z < 0.08$ morphological galaxy stellar mass functions*, MNRAS 513, 439 (2022), https://arxiv.org/abs/2203.08539

9. **Turner, R. J.**, Blake, C., Ruggeri, R., *Improving estimates of the growth rate using galaxy-velocity correlations: a simulation study*, MNRAS 502, 208 (2021), https://arxiv.org/abs/2101.09026

10. Bellstedt, S., Driver, S. P., Robotham, A. S. G., Davies, L. J. M., Bogue, C. R. J., Cook, R. H. W., Hashemizadeh, A., Koushan, S., Taylor, E. N., Thorne, J. E., **Turner, R. J.**, Wright, A. H., *Galaxy And Mass Assembly (GAMA): assimilation of KiDS into the GAMA database*, MNRAS 496, 3235 (2020), https://arxiv.org/abs/2005.11215

Conferences & Workshops – (*) indicates that I gave a talk at this event

(*) OzGrav Retreat — Brisbane, Australia
3 minute spotlight presentation & panel discussion — *Dec. 2024*

DESI Collaboration Meeting — Marseille, France
Jul. 2024

DESI Collaboration Meeting — Durham, UK
Jul. 2023

(*) MIAPbP Extragalactic Distance Scales workshop — Garching, Germany
In person presentation — *Jul. 2023*

(*) Cosmology from Home 2022 — Online conference
Prerecorded video — *Jul. 2022*

(*) Astronomical Society of Australia ASM 2022 — Hobart, Australia
In person presentation — *Jul. 2022*

Summer School in Astrostatistics & Astroinformatics — Online, Penn State University
Jun. 2022

Cosmology from Home 2021 — Online conference
Jul. 2021

Growth of Structure Summer Seminar Series — Online conference
Jun. 2021

(*) Cosmic Flows, Large-Scale Structure & Visualisations — Stellenbosch, South Africa
In person presentation — *Feb. 2020*

Invited Talks

- Feb. 2025 - Cosmic Flows 2025: Probing the Universe with Peculiar Velocities
- Jul. 2024 - Colloquium at Aix-Marseille University
- Jul. 2024 - Colloquium at Clermont Auvergne University
- Jul. 2023 - MIAPbP Extragalactic Distance Scales workshop
- Sep. 2021 - ICRAR-UWA MSc Physics Open Day

Collaborations

OzGrav Team Member
ARC Centre of Excellence — *Apr. 2024 – Present*

4MOST Science Team Member
4MOST Hemisphere Survey of the Nearby Universe (4HS) — *Jun. 2023 – Present*

Dark Energy Spectroscopic Instrument Team Member
Transients and Low-z Cosmology Working Group (TLZ) — *Dec. 2021 – Present*

Teaching

Student mentoring
Swinburne University of Technology *2022 – Present*

- PhD co-supervisor to one student, have mentored 3 others
- Mentored 4 Honours students, all of which went on to PhD positions

Work Experience Supervisor
Swinburne University of Technology *Dec. 2023*

- Planned and delivered a 5-day work experience program for a group of 11 high-school students from various backgrounds

Lab Demonstrator
Swinburne University of Technology *Aug. 2021 – Oct. 2021*

Professional Activities

Chair of DESI groups
Jan. 2024 – Present

- Co-chair of "Growth of structure with peculiar velocities" topical group as of Oct. 2024
- Acting chair of the TLZ working group when co-chairs are unavailable

CAS Postdoctoral Representative
Jun. 2024 – Present

MSc (Astronomy & Astrophysics) student representative
ICRAR-UWA *Feb. 2017 – Jun. 2018*

Proposals

ADACS 2024A Proposal
Q1/Q2 2024

- Awarded 1100 kSU on the ozstar/Ngarrgu Tindebeek supercomputer for the project "Testing cosmic expansion and gravity", designed to generate 1000 simulations for cosmological analysis

Outreach

Science comedy performance
Melbourne International Comedy Festival *Apr. 2024*

- Wrote and performed a 10-minute comedy presentation about my research to a sold-out crowd at Science Gallery Melbourne

CAS Open Day Volunteer
Swinburne University of Technology *2019 – Present*

AstroTour Guide
Swinburne University of Technology *2019 – 2023*

- Led 10+ AstroTour presentations for students in primary school, secondary school and at undergraduate level, as well as for the public

Article published in The Conversation
The best gift in the galaxy: an astronomer's guide to buying a home telescope *Dec. 2020*

- Over 43 000 readers

Scitech volunteer
Scitech, West Perth *Oct. 2018 – Feb. 2019*

ICRAR outreach volunteer
ICRAR-UWA *Feb. 2017 – Oct. 2018*

Skills

- **Programming languages:** R, python (*fluent*); C/C++, SQL (*familiar*)
- **OS:** Windows, Unix, macOS
- **Software:** Mathematica, TOPCAT, R statistical packages, standard python packages