Vikram Ravi

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Education

Ph.D., University of Melbourne 2011 - 2014
Thesis title: Evincing the histories of the cosmic supermassive black hole and galaxy populations with gravitational waves.
Advisors: Prof. Stuart Wyithe, Dr. George Hobbs (CSIRO Astronomy and Space Science).

B.Sc. in Physics (first class honours). 2006 - 2009
Honors thesis: Stellar radio transients from brown dwarfs to pulsars (supervised by Prof. Dayal Wickramasinghe)
Exchange program to the University of California, Berkeley (Fall 2008)

Awards & Honors

Sloan Research Fellowship 2024
Stefano Braccini Thesis Prize 2016
(awarded by the Gravitational Wave International Committee)
Charlene Heisler Thesis Prize 2016
(awarded by the Astronomical Society of Australia)
Kavli Fellow 2015
(invited speaker at Kavli Frontiers of Science Symposium, Makassar, Indonesia)
John Stocker Postgraduate Scholarship 2011
Australian Postgraduate Award 2011

Grants

PI, HST/STIS spectroscopy of AT2020vdq ($41k), NASA 2023
PI, CAREER: Fast Radio Bursts Illuminating the Unseen Universe ($517k)
National Science Foundation 2023-27
PI, Tidal Disruption Events in Active Galactic Nuclei ($80k), NASA 2022-23
PI, Science with Hybrid Radio/Optical DSN Tracking Antenna ($150k) JPL Research and Technology Development Fund 2022-24
PI, SPRITEly: A New Window into the Explosive, Dark Universe ($100k) Mt. Cuba Astronomical Foundation 2020-21
Co-PI, DSA-2000 radio camera ($15M to date) 2020-24
Schmidt Futures
PI, Unraveling the Mysteries of Fast Radio Bursts ($400k) 2020-22
Caltech and JPL President's and Director's Fund
PI, Ultra-Wide Band Spectro-Radiometry ($400k) 2019-21
Caltech and JPL President's and Director's Fund
Co-PI, Deep Synoptic Array ($6.2M) 2018-23
NSF Mid-Scale Innovations Program
Project Scientist, Deep Synoptic Array prototype ($300k) 2016-17
Caltech and JPL President's and Director's Fund
PI, NRAO ngVLA funded community study ($9k) 2016-17

Research Positions

Assistant Professor of Astronomy 2019-present
California Institute of Technology

Clay Postdoctoral Fellow 2018-2019
Center for Astrophysics | Harvard & Smithsonian

Millikan Postdoctoral Scholar in Astronomy 2015-2018
California Institute of Technology

Research Staff 2014-2015
Swinburne Institute of Technology (supervisor: Prof. Matthew Bailes)
Worked on Molonglo Observatory Synthesis Telescope upgrade

Junior Specialist 2010-2011
Space Sciences Laboratory, University of California, Berkeley (supervisor: Prof. Charles Townes)
Systems engineer and researcher with Infrared Spatial Interferometer

Research Assistant 2009-2010
CSIRO Astronomy and Space Science, Australia (supervisor: Prof. Dick Manchester)
Worked on gamma-ray and radio pulsar emission mechanisms.

Summer Vacation Student 2007-2008
CSIRO Astronomy and Space Science, Sydney (supervisor: Dr. George Hobbs)
Worked on radio pulsar glitches.

Research Assistant 2007
Australian National University (supervisor: Dr. Ken Baldwin)
Cold atom imaging and spectroscopy in Bose-Einstein condensate lab.

Teaching & Advising

Postdoctoral Scholar Advisor

Stella Ocker (Caltech/Carnegie)	2023-
Dongzi Li (Caltech)	2020-2023
Liam Connor (Caltech)	2020-2023
Dana Simard (Caltech)	2019-2022
Bade Uzgil (Caltech)	2021-2022

Graduate Research Advisor

Sol Bin (Hazel) Yun (Caltech - first-year advisor)	2024-
Kritti Sharma (Caltech)	2022-
Jakob Faber (Caltech)	2022-
Myles Sherman (Caltech)	2022-
Jean Somalwar (Caltech)	2020-
Chris Bochenek (Caltech)	2019-2021
Ge (Wendy) Chen (Caltech)	2019-2023
Nitika Yadlapalli (Caltech)	2019-2023

Lecturer

Ay126 (Interstellar Medium)	Spring 2025
Ph1a (Classical Mechanics)	Fall 2024
Ph1c TA (Electricity and Magnetism)	Spring 2023
Ay122c (High-energy observations)	Winter 2023
Ay 141 (Research Conference in Astronomy)	Spring 2021, 2022
Ay121 (Radiative Processes)	Fall 2020, 2021
Ay122b (Radio astronomy)	Winter 2020, 2021, 2022, 2024
Ay20 (Basic astronomy, stars, and the Galaxy)	Fall 2019

Undergraduate Research Advisor

Thuwaragesh Jayachandran (Caltech SURF)	2024
Dylan Perez (Caltech volunteer)	2024
Nitya Nigam (Caltech SURF, Columbia)	2024
Abra Gieger (Caltech SURF, Cornell)	2024
Michael Gutierrez (Caltech SURF and senior thesis)	2024
Olivia Rourke (Caltech WAVE, Cal Poly SLO)	2023
Matilda Eriksson (Caltech WAVE, Cal Poly SLO)	2023
Alessandra Squillace (Caltech WAVE, UofA)	2022
Abdullah Ateyeh (Caltech SURF)	2020
Varun Muralidaran (IIT Kanpur summer)	2020
Kovi Rose (Hebrew University of Jerusalem, Caltech)	2017
Julian Sanders (Caltech FSRI)	2017
Jerome Seebeck (Caltech SURF and senior thesis)	2021-22
Huan Yan Qi (Caltech SURF)	2016

Publication history & talks

I am an author of 238 publications and short notices (119 submitted or accepted to refereed journals), with over 7700 citations and an *h*-index of 46. I am the lead author of 28 publications in total (25 refereed/submitted), including two lead-author papers in the journal *Science,* one in *Nature*, and one in *Nature Astronomy*.

A full listing of my publications can be found on NASA ADS at https://ui.adsabs.harvard.edu/public-libraries/S0LBTeAgT76HOkq4muKitQ

Ten highest-cited publications as a primary author:

I. Bochenek, C., Ravi, V. et al. 2020, *A fast radio burst associated with a Galactic magnetar*, Nature, 587, 59
II. Shannon, R. M., Ravi, V. et al. 2015, *Gravitational waves from binary supermassive black holes missing in pulsar observations*, Science, 349, 1522
III. Ravi, V. et al. 2019, *A fast radio burst localised to a massive galaxy*, Nature, 572, 352
IV. Ravi, V. et al. 2016, *The magnetic field and turbulence of the cosmic web measured using a brilliant fast radio burst*, Science, 354, 1249
V. Ravi, V., Shannon, R. M., & Jameson, A. 2015, *A fast radio burst in the direction of the Carina dwarf spheroidal galaxy*, ApJL, 779, L5
VI. Shannon, R. M., Ravi, V. et al. 2013, *Gravitational-wave limits from pulsar timing constrain supermassive black hole evolution*, Science, 342, 334
VII. Ravi, V. & Lasky, P. D. 2014, *The birth of black holes: neutron star collapse times, gamma-ray bursts and fast radio bursts*, MNRAS, 441, 2433
VIII. Ho, A. Y. Q., Phinney, E. S., Ravi, V. et al. 2019, *AT2018cow: A Luminous Millimeter Transient*, ApJ 871, 73
IX. Yao, Y., Ravi, V., et al. 2023, *Tidal Disruption Event Demographics with the Zwicky Transient Facility: Volumetric Rates, Luminosity Function, and Implications for the Local Black Hole Mass Function*, ApJL, 955, L6
X. Ravi, V. 2019, *The prevalence of repeating fast radio bursts*, Nature Astronomy, 3, 928

Conference talks and seminars

32 major departmental colloquia at institutions in Australia, Canada, China, Germany, India, Netherlands, USA. 27 invited presentations at international conferences in Australia, Canada, France, Greece, Indonesia, Israel, Italy, Netherlands, Thailand, USA. See attached listing.

Highlights:

I. Organizer and SOC chair, *FRB2024,* Khao Lak, Thailand (November 2024).
II. Organizer, invited speaker and chair of a Special Session at the 241st meeting of the American Astronomical Society (Seattle, WA), *Early Science with the DSA-110* (January 2023).
III. Organizer, SOC chair and invited speaker, *Science with the DSA-2000 Workshop I* (January 2022).
IV. Invited reviews to open two FRB conferences and one ngVLA conference (Weizmann Institute of Science, Israel; FRB2019, Amsterdam, Netherlands, Computational Astrophysics in the ngVLA Era)
V. Plenary speaker on pulsar timing arrays, 12th Amaldi Conference on Gravitational Waves, Pasadena, USA (2017).
VI. Invited speaker on FRBs, CIFAR Cosmology & Gravity Theme Meeting, Whistler, Canada (2016).
VII. Invited speaker on astrophysics at the Kavli Frontiers of Science Symposium in Makassar, Indonesia (2015).

Professional Service

Caltech Astronomy "TF2035" committee	2024-2025
Co-chair, ZTF TDE/AGN science working group	2023-2024
Caltech PMA EXP fellowship committee	2023-2025
ERC and NWO proposal reviewer	2022
Caltech Astronomy graduate admissions committee	2019- (Chair 2021-2023)
NSF AST Committee of Visitors	2019
NRAO proposal review panel	2017-2019
NSF review panel	2016, 2020
Caltech Optical Observatories TAC	2016, 2020, 2023 (chair)
Parkes Pulsar Timing Array steering committee	2013, 2015
Australia Telescope User's Committee	2012-2013

Referee

Nature, Nature Astronomy, The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astrophysics and Space Science

IPTA 2025 Science Meeting LOC chair	2025
FRB2024 SOC Chair	2024
Organizer, AAS241 special session *Early Science with the DSA-110*	2023
SOC, Astrophysics of FRBs II, Center for Computational Astrophysics.	2023
Organizer and SOC chair *Science with the DSA-2000 Workshop I*	2022
FRB2021 SOC member	2021
Team Lead, Keck Institute for Space Sciences study: *The Next-Generation, Ground-Based Planetary Radar*	2020-2021
Co-organizer: Pasadena Area Postdoc Retreat	2015-2017
Co-organizer: International Pulsar Timing Array meeting	2012
Co-organizer: CSIRO ATNF student symposium.	2012

Professional Outreach & Diversity Activities	Great Basin Astronomy Festival AoT speaker	2024
	Caltech Seminar Day speaker	2024
	Caltech WAVE mentor	2022-2023
	AAS Press Conference presenter	2022, 2023
	Bishop Astronomy on Tap speaker	2022
	Caltech Astronomy Public Lecture	2020
	Featured on the *Newstalk* radio show *Futureproof with Jonathan McCrea*	2020
	Keynote speaker at CogX	2020
	Mentor for Harvard CfA Science Research Mentoring Program	2018-19
	Los Angeles Astronomy on Tap speaker	2018
	Cerro Coso Community College astronomy lecture (Bishop CA).	2017
	Caltech Freshman Summer Research Institute mentor	2017
	KXSC radio Squaminous Science Hour	2017
	Lecturer, USC Engineering honors program	2017
	Palomar Observatory Greenway Lecturer	2016-2017
	Blue Dot program, North State Public Radio	2016
	University of Melbourne Telescopes in Schools project	2012-2015
	Facilitator with Pulse@Parkes project	2009-2018
	Lecturer, Mt. Burnett Astronomical Society	2014

Departmental colloquia

1. Princeton Astrophysics / IAS joint colloquium, April 8, 2025, *The Deep Synoptic Array: results from the first FRB sample*
2. Goddard Astrophysics Colloquium, June 4, 2024, *The Deep Synoptic Array: results from the first FRB sample*
3. Trottier Space Institute seminar, April 9, 2024, *The Deep Synoptic Array: results from the first FRB sample*
4. UC Berkeley Astronomy Colloquium, September 7, 2023, *The Deep Synoptic Array: the origins of fast radio bursts*
5. Caltech Physics Colloquium, May 11, 2023, *The Deep Synoptic Array: the origins of fast radio bursts*
6. University of Maryland Astronomy Colloquium, April 19, 2023. *Fast Radio Bursts and the Unseen Universe.*
7. Stanford Applied Physics / Physics Colloquium, March 7, 2023. *The Deep Synoptic Array: Fast Radio Burst Probes of the Unseen Universe.*
8. Cornell Astronomy and Space Sciences Colloquium, April 28, 2022. *Fast Radio Bursts and the Unseen Universe.*
9. Jodrell Bank Center for Astrophysics Colloquium, March 10, 2021. *Fast Radio Bursts and the Deep Synoptic Array program.*
10. ASTRON Colloquium, January 28, 2021. *The Deep Synoptic Array Program.*
11. UC Berkeley Astronomy Colloquium, June 1, 2020. *Towards the origins of fast radio bursts.*
12. UCLA Astronomy Colloquium, February 12, 2020. *Missing matter, missing mass.*
13. Carnegie Observatories colloquium, September 10, 2019. *Towards the origins of Fast Radio Bursts.*
14. Center for Astrophysics | Harvard & Smithsonian Clay Lecture, May 9, 2019. *Fast Radio Bursts.*
15. CIERA Astrophysics Seminar, April 9, 2019. *Fast Radio Bursts.*

16. ASTRON Colloquium, November 29, 2018. *Radio-wavelength searches for the basis of dark matter.*
17. NRAO Socorro Colloquium, February 23, 2018. *Radio-wavelength searches for the basis of dark matter.*
18. Shanghai Astronomical Observatory Seminar, October 27, 2017. *The ten-element prototype of the Deep Synoptic Array (DSA-10) for FRB localization*
19. Caltech Astronomy Colloquium, October 26, 2016. *Fast Radio Bursts from Across the Universe?*
20. UCLA Physics and Astronomy Colloquium, October 20, 2016. *Fast Radio Bursts from Across the Universe?*
21. Swinburne Centre for Astrophysics and Supercomputing Colloquium, June 9, 2016. *Do Fast Radio Bursts Originate at Cosmological Distances?*
22. University of Melbourne Astrophysics Seminar, June 8, 2016. *Do fast radio bursts originate at cosmological distances?*
23. Arecibo Observatory Colloquium, May 23, 2016. *The Fast Radio Burst Zoo.*
24. Stanford KIPAC Seminar, May 3, 2016*. Fast radio bursts.*
25. Fermilab Astrophysics Seminar, February 22, 2016. *Pulsar timing limit on gravitational waves necessitates re-assessment of binary supermassive black hole population*
26. McGill Space Institute Seminar, February 2, 2016. *A tale of two fast radio bursts*
27. JPL Astrophysics lunch seminar, September 28, 2015. *Gravitational-wave limit forces re-think of supermassive black hole evolution*
28. Monash Centre for Astrophysics Colloquium, March 24, 2015. *Binary supermassive black hole evolution rethought.*
29. Albert Einstein Institute (Golm) Colloquium, June 12, 2014. *Astrophysical predictions for gravitational waves from binary SMBHs / Fast radio bursts following short GRBs.*
30. Curtin Institute for Radio Astronomy Colloquium, May 29, 2014. *Choose your own adventure! - Fast radio bursts.*
31. CSIRO Astronomy and Space Science Colloquium, May 21, 2014. *What gravitational-wave observations can tell us about the super-massive black hole population of the Universe.*
32. TIFR Bombay Astrophysics Seminar, February 17, 2012. *Gravitational wave astrophysics with pulsar timing arrays.*

Invited presentations at international conferences

1. IPTA Meeting 2024, Sexten, Italy, June 24-28, 2024. *PTA Science with the DSA-2000.*
2. Towards a physical understanding of tidal disruption events, KITP, Santa Barbara, CA, April 22 - May 17, 2024. *Radio TDEs.*
3. Astrophysics of FRBs II, Center for Computational Astrophysics, New York City, NY, September 11-13, 2023. *DSA-2000.*
4. Special Session on *Early Science with the DSA-110* at AAS 241, January 8, 2023. *The DSA-110.*
5. IPTA Meeting (online), June 21-23, 2022. *The DSA-2000.*
6. Computational Astrophysics in the ngVLA Era, Center for Computational Astrophysics, New York City, NY, June 7-9, 2022. *The Dynamic Universe: What Comes Next?*

7. Black Hole Initiative Annual Conference, May 18-20, 2022, Cambridge, MA. *How do black holes earn their living?*
8. Astrophysics of FRBs, Center for Computational Astrophysics, New York City, NY, February 3-5, 2020. *DSA Update.*
9. FRB2019: Fast Radio Bursts and their Possible Neutron-Star Origins, Amsterdam, Netherlands, February 18-20, 2019. Opening review on *What we know about FRBs.*
10. Workshop on Fast Radio Bursts, Weizmann Institute of Science, Israel, December 3-13, 2018. Opening review on *Observations of Fast Radio Bursts.*
11. The Power of Faraday Tomography — Towards 3D Mapping of Cosmic Magnetic Fields, Miyazaki, Japan, May 28 - June 2, 2018. *FRB measurements of circum- and inter-galactic magnetic fields.*
12. FRB2018: Finding and Understanding Fast Radio Bursts, Melbourne, Australia, February 14-16, 2018. *Imagining, and realizing, the ultimate FRB instrument.*
13. The Edoardo Amaldi Conference on Gravitational Waves, Pasadena, CA, July 9-14, 2017. Plenary talk on *Pulsar timing and gravitational waves.*
14. Developing the ngVLA Science Program Workshop, Socorro, NM, June 26-29, 2017. *How the ngVLA can enable gravitational-wave science.*
15. Workshop on Fast Radio Bursts, Montreal, Canada, June 13-15, 2017. *Localizing the brightest FRBs.*
16. The Labyrinth of the Unexpected, Kerastari, Greece, May 29 - June 3, 2017. *Fast Radio Burst Philately.*
17. Hot-wiring the Transient Universe V, Philadelphia, PA, October 10-14, 2016. *The hottest transients in the Universe.*
18. GRavitational-wave Astronomy Meeting in Paris (GRAMPA), Paris, France, August 29 - September 2, 2016. *Pulsar timing arrays: spanning the chasm between GW source theory and observation.*
19. Boutiques & Experiments 2016, Pasadena, CA, July 21-23, 2016. *DSA-10.*
20. 21st International Conference on General Relativity and Gravitation, New York City, NY, July 10-15, 2016. *Predictions for the GWB from binary SMBHs given PTA constraints.*
21. CIFAR Cosmology & Gravitation Theme Meeting, Whistler, CA, March 30 - April 2, 2016. *Ultra-bright fast radio bursts.*
22. Boutiques & Experiments 2015, Pasadena, CA, August 28-29, 2015. *Molonglo: Refurbished & Resurgent.*
23. Kavli Frontiers of Science Indonesian-American Symposium, Makassar, Indonesia, July 28-31, 2015. *Using a Galaxy-Sized Telescope to Rethink Supermassive Black Hole Evolution.*
24. International Pulsar Timing Array Science Meeting, Banff, Canada, June 23-27, 2014. *Vikram's Thoughts on Interpreting GWB Constraints.*
25. Extreme Astrophysics in an Ever-Changing Universe, Ierapetra, Greece, June 16-20, 2014. *Choose your own adventure! - Fast radio bursts.*
26. International Pulsar Timing Array Science Meeting, Krabi, Thailand, June 23-28, 2013. *The surprising effects of SMBH binary eccentricities and environmental interactions on the GWB.*
27. Evolutionary Map of the Universe Meeting, Pasadena, CA, August 23-25, 2010. *Identifying radio stars.*