Vishal Gajjar

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RESEARCH INTEREST

Search for Intelligent life in the Universe; Pulsars; Magnetars; Fast Radio Burst; Radio Transients; Large-scale surveys; Machine Learning; Digital instrumentation for radio astronomy

RESEARCH POSITIONS

Academic Researcher Breakthrough Listen, UC Berkeley, 2021 – current
Post-doctoral Fellow Breakthrough Listen, UC Berkeley, 2018 – 2020
Templeton post-doctoral fellow, Space Science Lab, UC Berkeley, 2016 – 2018
West-light post-doctoral fellow, Xinjiang Astronomical observatory, China, 2015 – 2016

EDUCATION

Doctor of Philosophy (Physics), TIFR, Mumbai, India, 2014
Master of Science (Physics Major), TIFR, Mumbai, India, 2009
Bachelor of Engineering (Electronics and Communication), S. S. Engineering College, Bhavangar University, Bhavnagar, India, 2005

ACADEMIC SERVICES

Expert reviewer for multi-year National Research Grant, **National Science Center, Poland**, 2021
Panel Member of **National Science Foundation (NSF) AST proposal review**, Washington DC, USA, 2019
SOC member of Penn State University SETI symposium, Penn State University, PA, USA, 2022
SOC member for a special session, COSPAR 2020, Sydney, Australia, 2020
Reviewer for GMRT and ASTROSAT proposals
Organizer of weekly SETI meeting at the Department of Astronomy, UC Berkeley, 2016 – 2019
Reviewer of numerous papers from ApJ, ApJ Letters, MNRAS, and Astrophysics and Space Science
SOC member of the annual science day, GMRT, India, 2009 – 2011
SOC member for the 13^{th} *Young Astronomers meet*, Physical Research Laboratory, Ahmadabad, India, 2010
Support Astronomer for the GMRT proposal on "Observations of M−draft stars", GMRT, India, 2009

FELLOWSHIPS AND AWARDS

Templeton post-doctoral fellow, UC Berkeley, USA, 2016
West-Light Funding, Chinese Academy of Science, Urumqi, China, 2014
IAU Grant to attend the General assembly in Beijing, China, 2012
Young Scientist Award at the URSI General Assembly, Istanbul, Turkey, 2014
Senior Research Fellowship at the NCRA (2009), India
Junior Research Fellowship at the NCRA (2007-2009), India
ASTRON summer school, Dwingeloo, Neatherlands, 2010
Best oral presentation at the 12^{th} Young Astronomers Meet, Bengaluru, India, 2009
Internship in Radio Astronomy at the NCRA, Pune, India, 2006 – 2008

Publications Record

I am author and co-author of **96 publications** (42 refereed journals), with around 1600 citations and an **h-index of 21** including **five** publications in **Nature** and **Nature Astronomy**. A full list of my publications can be found at NASA ADS

MEDIA

Press Conference
Panel member and speaker for a press conference on *Peering Deeper Into the Lair of the Repeating Fast Radio Burst* at the **231st American Astronomical Society** meeting, Washington DC, USA, 2018.
Other Media activities
Interviewed by numerous TV, radio and print media (CBS, KRON4, BBC, CNET, space.com, Times of India, The Better India, Daily Californian and others) and appeared in around 60 media articles (National Geographic, Forbes, Newsweek, Huffpost, Telegraph, The guardian, New Scientist, Gizmodo, Smithsonian.com, The Independent and others).

INSTRUMENTS AND COMMISSIONING

Lead real-time multi-beam commensal transient detection system at FAST, China
Lead the commissioning of high-time resolution and polarization capabilities for Breakthrough Listen digital instrument at the GBT, USA
Lead transient detection pipeline development for BL program (SPANDAK) utilizing ML candidate verification
Co-lead the commissioning of BL digital hardware at e-MERLIN/JBO, UK
Lead for the full refurbishing and commissioning operation of 4-meter dish antenna for radio astronomy school, NCRA, Pune, India
Lead the commissioning of BL digital hardware at International LOFAR stations at Ireland and Sweden

OBSERVATION EXPERIENCE

More than **400 hours** of combined observing experience with the Green Bank Telescope (USA), the Parkes radio telescopes (Australia), Sardinia Radio Telescope (Italy), and the Giant Meterwave Radio Telescope (India)
PI and Co-PI of 10 accepted observing proposals with the Giant Meterwave Radio Telescope (India)
PI and Co-PI of six accepted observing proposals with the Green Bank Radio Telescope (USA)

TEACHING AND MENTORING

Current Graduate students
Owen Johnson, Trinity College, Dublin, Ireland, 2022 – current
Sand, Ketan, PhD Candidate, McGill University, Canada, 2021 - current
Suresh, Akshay, PhD Candidate, Cornell University, Ithica, NY, USA, 2021 - current
Perez, Karen, PhD Candidate University of Columbia, USA, 2019 - current
Previous Graduate students
Zhang, Yunfan G., PhD Candidate UC Berkeley, USA, 2017-2018
Li, Shiyu, PhD Candidate, NAOC, China, 2017-2018
Niu, Chen-hui, PhD Candidate, CAS, China, 2017-2018
Wen, Zhi-Gong, Staff XAO, China, 2014-2016
Mentored undergraduate students : 20
Teaching Assistant for a course on 'Statistical techniques in data analysis' with Dr. Dipanjan Mitra and Prof. Bhal Chandra Joshi at the IISER Pune, 2011
Teaching Assistant for a course on 'Stellar Astrophysics' with Dr. Dipanjan Mitra at the NCRA-IUCAA Grad school, Pune, 2010
Lecturer on NCRA–IUCAA winter school, Pune, India, 2010
Lecturer on the 'Data analysis using MATLAB for the 4-meter dish antenna' in the NCRA−TIFR Radio Astronomy summer school, Pune, India 2009

Selected Invited talks and Departmental Colloquia

Guest lecturer NCRA-IUCAA Radio Astronomy Winter School, Pune, 2021
Colloquium at Penn State University, State College, PA, USA, November 2021
Colloquium at National Center for Radio Astrophysics, Pune, India. October 2021.
Invited talk at the conference *EHT and Galactic Center Pulsars*, Paris Observatory, June 2020
Invited speaker at 235th American Astronomical Society, Hawaii, USA, January 2020.
Invited member at KISS Technosignatures Workshop, California Institute of Technology (Caltech), Pasadena, USA, March 2019.
Invited talk at the Xinjian Astronomical Observatory, Urumqi, China, November 2019.

Invited talk at the Kavli Institute for Theoretical Sciences, Beijing, November 2019.
Colloquium at National Center for Radio Astrophysics, Pune, India. December 2018.
Colloquium at National Center for Radio Astrophysics, Pune, India, December 2017.
Invited member at the Breakthrough Discuss symposium, USA, 2017-2021.
Invited talk at TIFR sponsored science popularization event, Mumbai, 2012
Invited talk at *A for Astronomy seminar series*, Western Regional Instrumentation Centre (WRIC), Mumbai, India, 2012
Invited seminar at the Department of Physics & Astronomy, University of Manchester, UK, 2012

Publications in Nature

Peter X. Ma.; Cherry Ng; Leandro R.; (6 co-authors); **Gajjar, V.** et al. 2022
Nature Astronomy (accepted)
The first deep-learning search for technosignatures of 820 nearby stars

Li, D.; (12 authors); **Gajjar, V.**; (18 authors), 2021
Nature 598, 267
A bimodal burst energy distribution of a repeating fast radio burst source

Michilli, D.; Seymour, A.; Hessels, J. W. T.; Spitler, L. G.; **Gajjar, V.**; (29 authors), 2018
Nature, 553, 182
An extreme magneto-ionic environment associated with the fast radio burst source FRB 121102

Sheikh, S.; (6 authors); **Gajjar, V.**; (10 authors), 2021
Nature Astronomy, 5, 1153
Analysis of the Breakthrough Listen signal of interest blc1 with a technosignature verification framework

Smith, S.; (5 authors); **Gajjar, V.**; (10 authors), 2021
Nature Astronomy, 5, 1148
A radio technosignature search towards Proxima Centauri resulting in a signal-of-interest

Selected Refereed Publications (Total: 96, Refereed: 42 h-index: 21)

Student led publications are marked with *

*Suresh, A., Cordes, J. M., Chatterjee, S., **Gajjar, V.** et al. 2022,
ApJ, 933, 121
4-8 GHz Fourier-domain Searches for Galactic Center Pulsars

*Sand, K. R., Faber, J. T., **Gajjar, V.**, et al. 2022,
ApJ, 932, 98
Multiband Detection of Repeating FRB 20180916B

Gajjar, V; LeDuc, Dominic.; Chen, Jiani; Siemion, A. P. V. et al., 2022
ApJ, 932, 98
Searching for Broadband Pulsed Beacons from 1883 Stars Using Neural Networks

Gajjar, V; Perez, K. I.; Siemion, A. P. V.; (17 authors), 2021
AJ, 162, 22
The Breakthrough Listen Search For Intelligent Life Near the Galactic Center. I.

*Traas, R.; Croft, S.; **Gajjar, V**; (10 authors), 2021
ApJ, 161, 286
The Breakthrough Listen Search for Intelligent Life: Searching for Technosignatures in Observations of TESS Targets of Interest

Pilia, M.; Burgay, M.; Possenti, A.; Ridolfi, A.; **Gajjar, V.**; Corongiu, A.; (31 authors), 2020
ApJ Letters, 896, L40
The Lowest-frequency Fast Radio Bursts: Sardinia Radio Telescope Detection of the Periodic FRB 180916 at 328 MHz

Price, D. C.; Foster, G.; Geyer, M.; van Straten, W.; **Gajjar, V.**; (28 authors), 2019
MNRAS, 486, 3636
A fast radio burst with frequency-dependent polarization detected during Breakthrough Listen observations

*Zhang Y. G..; **Gajjar, V.**; Foster G.; Siemion, A. P. V.; Cordes, J.; Law, C.; Wang Y., 2018
ApJ, 866, 18
Fast Radio Burst 121102 Pulse Detection and Periodicity: A Machine Learning Approach

Gajjar, V. Siemion, A. P. V.; (31 authors), 2018
ApJ, 863, 9
Highest-frequency detection of FRB 121102 at 4-8 GHz using the Breakthrough Listen Digital Backend at the Green Bank Telescope

Hessels, J. W. T; (13 authors); **Gajjar, V.**; (11 authours), 2019
ApJ Letters, 876, 14
FRB 121102 Bursts Show Complex Time-Frequency Structure

Gajjar, V.; Yuan, J. P.; Yuen, R.; Wen, Z. G.; Liu, Z. Y.; Wang, N., 2017
ApJ, 850, 15
On Nulling, Drifting, and Their Interactions in PSRs J1741-0840 and J1840-0840

Enriquez, J. Emilio; Siemion, Andrew; Foster, Griffin; **Gajjar, V.**; (9 authors), 2017
ApJ, 849, 104
The Breakthrough Listen Search for Intelligent Life: 1.1-1.9 GHz Observations of 692 Nearby Stars

*Wen, Z. G.; Wang, N.; Yuan, J. P.; Yan, W. M.; Manchester, R. N.; Yuen, R.; **Gajjar, V.**, 2016
A&A, 592, 127
Investigation of nulling and subpulse drifting properties of PSR J1727-2739

Gajjar, V.; Joshi B. C.; Kramer M.; Karuppusamy R. and Smith R., 2014
ApJ, 797, 18
Frequency independent quenching of pulsed emission

Gajjar, V.; Joshi B. C.; Geoffrey W., 2014
MNRAS, 439, 221
On the long nulls of PSRs J1738−2330 and J1752+2359

Coenen, Thijs; (10 authours); **Gajjar, V.**; (88 authors), 2014
A&A, 570, 16
The LOFAR pilot surveys for pulsars and fast radio transients

Roy N., Mathur S., **Gajjar V.** and Patra N. N., 2013
MNRAS Letters, 436, L94,
Stringent constraints on the HI spin temperature in two z ¿ 3 Damped Lyman-α systems from redshifted 21 cm absorption studies

Gajjar, V.; Joshi B. C.; and Kramer M., 2012
MNRAS, 424, 1197,
Survey of nulling pulsars using the Giant Meterwave Radio Telescope