Sushma Kurapati

PERSONAL DETAILS

Address: ASTRON,
the Netherlands Institute for Radio Astronomy
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Date of Birth: 17$^{\text{th}}$ April, 1993
Nationality: Indian

RESEARCH INTERESTS

Galaxy formation and evolution, angular momentum-mass relations, dark matter distribution in galaxies, galaxy environments, void galaxies, extraplanar gas in spiral galaxies, radio astronomy, superthin galaxies, and ultra-diffuse galaxies.

POSITIONS

Scientist A October, 2024 – Present
ASTRON, the Netherlands Institute for Radio Astronomy.

SARChI Postdoctoral Fellow May, 2021 – September, 2024
Department of Astronomy, University of Cape Town, South Africa

Postdoctoral Fellow Nov, 2020 – Apr, 2021
Inter-University Centre for Astronomy and Astrophysics, Pune, India

Maternity leave May, 2019 – Feb, 2020

Work from home mother Mar, 2020 – Jun, 2022

EDUCATION

Ph.D. in Astrophysics Nov, 2020
National Center for Radio Astrophysics (NCRA), Tata Institute of Fundamental Research, Pune, India
Thesis title: Angular momentum and dark matter in void dwarf galaxies
Adviser: Prof. Jayaram N. Chengalur

Integrated Master of Sciences (M.Sc) in Physics June, 2014
Indian Institute of Technology (IIT), Kharagpur, India

ACADEMIC ACHIEVEMENTS AND GRANTS

- URSI Young Scientist Award (AT-RASC 2024) $\sim$ €1500.
- International Astronomical Union (IAU) grant for presenting at IAU Symposium 392 (2024) $\sim$ €700
- Research Explorer Ruhr grant for visiting Ruhr University, Germany (2020).
- International Astronomical Union (IAU) grant for presenting at IAU Symposium 344 (2018) $\sim$ €1100
- DST international travel grant of 200000 INR ($\sim$ €2200)
- Recipient of DST, Inspire fellowship (2009-2014)
- Qualified in all India level CSIR-NET with All India rank 72 (2015)
- Qualified in all India level GATE physics exam with All India Rank 83 (2014)

TECHNICAL SKILLS

Developed Tools

- A python tool for injecting mock or simulated realistic sources into HI data cubes to evaluate the completeness and reliability of source finding software as a function of source parameters.

Astronomy Analysis Software

- CARACaL, IDIA, and SDP pipelines for MeerKAT data reduction
- AIPS, CASA, and GIPSY software for (GMRT, JVLA, and WSRT) data reduction
- TiRiFiC, FAT, 3D-Barolo, and Rotcur for rotation curve fitting
- SoFiA for automatic HI source finding
- CARTA, DS9 and KVIS for miscellaneous purposes

Computer Programming

- Python

TEACHING EXPERIENCE

- Taught **"Extragalactic Astronomy"**, Honours Course, University of Cape Town (Class of 17) Jul–Nov, 2024.

INTERNATIONAL COLLABORATIONS

- **PHANGS:** Physics at High Angular Resolution in Nearby GalaxieS Since 2022.
- **MHONGOOSE:** MeerKAT Observations of Nearby Galactic Objects - Observing Southern Emitters Since 2022.
- **MIGHTEE:** The MeerKAT International GHz Tiered Extragalactic Exploration Since 2021.
- **SMGPS:** SARAO MeerKAT Galactic Plane Survey Since 2021

ADVISING/ MENTORING POSITIONS

- Adviser to a Masters student (*Austun Louw*), January 2023 - present
- Adviser to an Honours student (*Austun Louw*), June-October 2022
- Mentored a Ph. D. student (*Sambatra Rajohnson*), July 2021 - Mar, 2024

PROFESSIONAL ACTIVITIES AND OUTREACH

- Astronomy & Astrophysics journal reviewer
- Giant Metrewave Radio Telescope proposals reviewer, July, 2020 - Present
- Member of Transformation and Inclusivity Committee, March 2024 - present
- Postdoc Representative, January 2022 - February, 2024
- Local Organizing committee, PHISCC meeting, 2023.
- Local Organizing committee, PHISCC meeting, 2017.
- Actively participated in open day programs at UCT, 2022- Present
- Actively participated in science day programs at GMRT, 2017- 2019

CONFERENCES AND SEMINARS

Colloqium	Department of Astronomy, University of Cape Town *Tracing Cosmic and Galactic Structures with MeerKAT HI Surveys*	Nov, 2024
Special seminar	Department of Astrophysics, University of Oxford, U.K. *Probing gas accretion processes with ultra-deep MeerKAT observations*	Sep, 2024
Contributed Talk	IAU symposium, Cape Town, South Africa *Uncovering extraplanar gas in UGCA250 with ultra-deep MHONGOOSE survey*	Aug, 2024
Contributed Talk	Hidden Challenges to Solving Galaxy Formation, Kruger, South Africa *Uncovering extraplanar gas in UGCA250 with ultra-deep MHONGOOSE survey*	Aug, 2024
Contributed Talk	URSI Atlantic Radio Science Conference, Gran Canaria, Spain *Tracing the Local Void and its substructure with the MeerKAT Galactic Plane Survey*	May, 2024
Contributed Talk	MeerKAT@5 Conference, Stellenbosch, South Africa *Uncovering extraplanar gas in UGCA250 with ultra-deep MHONGOOSE survey*	Feb, 2024
Colloquium	SAAO, Cape Town, South Africa *Galaxies in the Void: Large-Scale Structures and Metal-Poor Dwarfs*	Feb, 2024
Contributed Talk	SARAO Postgraduate Conference, Cape Town *Uncovering extraplanar/anomalous gas in UGCA250 with MHONGOOSE survey*	Dec, 2023
Lunch Talk	ASTRON, the Netherlands *Tracing the Local Void and its substructure with MeerKAT*	Oct, 2023
Contributed Talk	A journey through galactic environments, Porto Ercole, Italy *Tracing the Local Void and its substructure with MeerKAT*	Sep, 2023
Contributed Talk	Galaxy transformation across space and time, Canberra, Australia *The HI specific angular momentum- mass relation*	Sep, 2023
Contributed Talk	PHISCC meeting, Cape Town, South Africa *Uncovering extraplanar and anomalous gas in UGCA250*	Mar, 2023
Contributed Talk	PHISCC meeting, Cape Town, South Africa *Tracing the Local Void and its substructure with MeerKAT*	Mar, 2023
Contributed Talk	SARAO Postgraduate Conference, Johannesburg, South Africa *Exploring the Local Void with MeerKAT Galactic Plane Survey*	Dec, 2022
Contributed Talk	SARAO Postgraduate Conference (virtual) *Gas specific angular momentum - mass relation*	Nov, 2021
Seminar	IUCAA, Pune, India (virtual) *Gas specific angular momentum - mass relation*	Jun, 2021
Colloquium	Ruhr-Universität Bochum, Bochum, Germany (virtual) *Gas specific angular momentum - mass relation*	Jan, 2021
Contributed Talk	The Metrewavelength Sky - II, Pune, India *Mass models of gas-rich void dwarf galaxies,*	Mar, 2019
Contributed Talk	HI story of nearby universe , Groningen, the Netherlands *Angular momentum of dwarf galaxies*	Sep, 2018

Seminar	Institut d'astrophysique de Paris, Paris, France *Angular momentum of dwarf galaxies*	Aug, 2018
Seminar	Ruhr-Universität Bochum, Bochum, Germany *Angular momentum of dwarf galaxies*	Aug, 2018
Contributed Talk	IAU dwarf galaxy symposium, Vienna, Austria *Angular momentum of dwarf galaxies,*	Aug, 2018
Contributed Talk	Galaxy Evolution and Dynamical Structures, Pune, India *Angular momentum of dwarf galaxies*	Jan, 2018
Contributed Talk	XXXVI Meeting of Astronomical Society of India, Hyderabad, India *Angular momentum of dwarf galaxies*	Mar, 2018
Contributed Talk	XXXV Meeting of Astronomical Society of India, Jaipur, India *HI as a probe for dwarf galaxy evolution in different environments*	Mar, 2017
Contributed Talk	PHISCC meeting, NCRA-TIFR, Pune, India *HI observations of dwarf galaxies in Lynx-Cancer Void*	Feb, 2017

OBSERVING EXPERIENCE

MeerKAT	*Extremely metal poor dwarf galaxies in voids* PI: **Sushma Kurapati**	*60 hrs*
MeerKAT	*Studying the Origin of HI Clouds around M31* PI: D.J. Pisano, Tech lead: **Sushma Kurapati**	*16 hrs*
MeerKAT	*A Complete Picture of Atomic Gas, Molecular Gas, and Star Formation in Ten of the Best-Studied MeerKAT-Visible Galaxies* PI: D.J. Pisano, Tech lead: **Sushma Kurapati**, PHANGS-HI team	*60 hrs*
GMRT	*HI observations of eXtremely Metal Poor (XMP) void dwarf galaxies* PI: **Sushma Kurapati**	*50 hrs*
GMRT	*HI as a probe of dwarf galaxy transformations in dense environments* PI: **Sushma Kurapati**	*120 hrs*
GMRT	*HI bearing ultra diffuse galaxies* PI: **Sushma Kurapati**	*57 hrs*
GMRT	*HI bearing ultra diffuse galaxies* PI: **Sushma Kurapati**	*100 hrs*
GMRT	*Study of HI gas in quenched galaxies* PI: Omkar Bait. Tech lead: **Sushma Kurapati**	*24 hrs*
JVLA	*Resolved atomic ISM, HII regions, and supernova remnants* PI: Eric Koch	*176 hrs*
MeerKAT	*Studying the baryonic content of galaxies near cosmic noon* PI: Miroslava Dessauges	*111 hrs*
GMRT	*HI-MaNGA study of green valley late-type galaxies* PI: Omkar Bait.	*36 hrs*
GMRT	*HI study of candidate high sSFR dwarfs in SDSS IV MaNGA* PI: Omkar Bait.	*24 hrs*

GMRT	*HI-MaNGA study of green valley late-type galaxies using the GMRT* PI: Omkar Bait.	*36 hrs*
GMRT	*Finding HI in local analogs of high redshift galaxies* PI: Sangeeta Malhotra	*12 hrs*
JVLA	*Deep HI imaging of a 'pure' HI ring around a quiescent galaxy AGC 203001* PI: Omkar Bait	*24 hrs*
GBT	*Finding HI in local analogs of high redshift galaxies* PI: Sangeeta Malhotra	*47.25 hrs*
Arecibo	*Finding HI in local analogs of high redshift galaxies* PI: Sangeeta Malhotra	*56 hrs*

Ph.D. THESIS

Kurapati, S., *Angular momentum and dark matter in void dwarf galaxies*, PhD thesis, TIFR, National Center for Radiophysics, Pune, November 2020.

PUBLICATIONS IN REFEREED JOURNALS

ADS Link

Lead author publications (total: 10)

- **Kurapati, S.**, Pisano, D.J., de Blok, W. J. G, et al. *Uncovering Extraplanar and Anomalous Gas in UGCA250 with the MHONGOOSE Survey* MNRAS, 2025, Impact Factor: 5; Q1; DOI:10.1093/mnras/staf387
- **Kurapati, S.,** Pustilnik, S. A.., Egorova, E., *The HI study of XMP gas-rich dwarfs in nearby voids - I.*, 2024, MNRAS, 533, 1178, Impact Factor: 5; Q1; DOI:10.1093/mnras/stae1894
- **Kurapati, S.**, Kraan-Korteweg, R.C, Pisano, D.J.., et al, *HI Galaxy Signatures in the SARAO MeerKAT Galactic Plane Survey–II. The Local Void and its substructure.*, MNRAS, 2024, 528, 542, Impact Factor: 5; Q1 DOI: 10.1093/mnras/stad3823
- Dutta, R., **Kurapati, S.**, Aditya, J.N.H.S., et al., *Probing galaxy evolution through HI 21-cm emission and absorption: current status and prospects with the Square Kilometre Array.*, 2022, JoAA 43.2 (2022): 103, Impact factor: 1, Q3; DOI: 10.1007/s12036-022-09875-y
- **Kurapati, S.,** Chengalur, J.N., Verheijen, M. A.W, *The HI angular momentum - mass relation*, 2021, MNRAS, 507, 565, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stab2230
- **Kurapati, S.,** Chengalur, J.N., Pustilnik, S., and Kamphuis, P., *Mass models of gas-rich void dwarf galaxies*, 2020, MNRAS, 291, 4993., Impact Factor: 5; Q1; DOI: 10.1093/mnras/stz3334
- Bait,O. **Kurapati, S.**, et al., *Discovery of a large HI ring around the quiescent galaxy AGC 203001,* 2020, MNRAS, 492, 1, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stz2972
- **Kurapati, S.,** Banerjee, A., Chengalur, J.N. et al., *Mass modelling of a superthin galaxy, FGC1540*, 2018, MNRAS, 479, 5686., Impact Factor: 5; Q1; DOI: 10.1093/mnras/sty1856
- **Kurapati, S.,** Chengalur, J.N., Pustilnik, S., and Kamphuis, P., *Angular momentum of dwarf galaxies*, 2018, MNRAS, 479, 228, Impact Factor: 5; Q1; DOI: 10.1093/mnras/sty1397
- **Kurapati, S.,** Chandra, P., Wade G., et al., *A JVLA survey of the high-frequency radio emission of the massive magnetic B- and O-type stars*, 2017, MNRAS, 465, 2160., Impact Factor: 5; Q1, DOI: 10.1093/mnras/stw2838

Co-authored publications: (total: 18)

- Vernose, S. et al. (including **Kurapati, S.**), *Searching for HI around MHONGOOSE Galaxies via Unconstrained Spectral Stacking*, 2025, A&A, 693, A97, Impact Factor: 6.5; Q1;
- Rajohnson, S. H. A. et al., (including **Kurapati, S.**), *Revealing hidden structures in the Zone of Avoidance – a blind MeerKAT HI Survey of the Vela Supercluster*, 2024, MNRAS, 535, 3429, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stae1354
- Ali, A. et al. (including **Kurapati, S.**), *Jet-mode feedback in NGC5972: insights from resolved MUSE, GMRT and VLA observations*, 2025, APJ.
- Luber, N. et al. (including **Kurapati, S.**), *CHILES IX: The HI Content and Star Formation in Different Cosmic Web Environments in CHILES and TNG Simulations*, 2025, APJ.
- Eibensteiner, C. et al., (including **Kurapati, S.**), *PHANGS-MeerKAT and MHONGOOSE HI observations of nearby spiral galaxies: physical drivers of the molecular gas fraction, R_{mol}*, 2024, A&A, 691A, 163E, Impact Factor: 6.5; Q1; DOI: 10.1051/0004-6361/202449944
- Laudage, S. et al. (including **Kurapati, S.**), *Neutral atomic and molecular gas dynamics in the nearby spiral galaxies NGC 1512, NGC 4535, and NGC 7496*, 2024, A&A, 690A, 169L; Impact Factor: 6.5; Q1; DOI: 10.1051/0004-6361/202450265
- Rajohnson, S. H. A. et al., (including **Kurapati, S.**), *HI Galaxy Signatures in the SARAO MeerKAT Galactic Plane Survey-III. Unveiling the obscured part of the hidden Vela Supercluster*, 2024, MNRAS, 531, 3486, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stae1354
- Maccagni, F. M. et al., (including **Kurapati, S.**), *MHONGOOSE discovery of a gas-rich low-surface brightness galaxy in the Dorado Group*, 2024, A&A, 690, A69, Impact Factor: 6.5; Q1; DOI: 10.1051/0004-6361/202449441
- de Blok W.J.G. et al., (including **Kurapati, S.**), *MHONGOOSE — A MeerKAT Nearby Galaxy Survey*, 2024, A&A, 688, A109, Impact Factor: 6.5; Q1; DOI: 10.1051/0004-6361/202348297
- Goedhart, S. et al. (including **Kurapati, S.**), *The SARAO MeerKAT 1.3 GHz Galactic Plane Survey*, 2024, MNRAS, 531, 649, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stae1166
- Sinigaglia, F. et al., (including **Kurapati, S.**), 2024, MNRAS *MIGHTEE-HI: HI galaxy properties in the large-scale structure environment at $z \sim 0.37$ from a stacking experiment*, 2024, MNRAS, 529, 4192, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stae713
- Steyn, N. et al. (including **Kurapati, S.**), *HI Galaxy Signatures in the SARAO MeerKAT Galactic Plane Survey -I. Probing the richness of the Great Attractor Wall across the inner Zone of Avoidance* , 2023, MNRAS, 529L, 88S, Impact Factor: 5; Q1; DOI: 10.1093/mnrasl/slad196
- Pan, H. et al. (including **Kurapati, S.**), *MIGHTEE-HI: The M_{HI} – M_* relation over the last billion years* 2023, MNRAS, 525(1):256-269, Impact factor:5, Q1; DOI: 10.1093/mnras/stad2343
- Ponomareva, A. et al. (including **Kurapati, S.**), *MIGHTEE-H I: the first MeerKAT H I mass function from an untargeted interferometric survey* 2023, MNRAS, 522(4):5308-5319, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stad1249
- Namumba, B. et al. (including **Kurapati, S.**), *MIGHTEE-H I: possible interactions with the galaxy NGC 895* 2023, MNRAS, 521(4):5177-5190, Impact Factor: 5.2; Q1; DOI: 10.1093/mnras/stad857
- Sinigaglia, F. et al., (including **Kurapati, S.**), *MIGHTEE-HI: Evolution of HI Scaling Relations of Star-forming Galaxies at $z < 0.5$.*, 2022, ApJL, **935**, (1):L13, Impact Factor: 7.9; Q1; DOI: 10.3847/2041-8213/ac85ae
- Rajohnson, S., (including **Kurapati, S.**), *MIGHTEE-H I: the H I size-mass relation over the last billion years*, 2022, MNRAS, 512(2):2697–2706, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stac693
- Aditya, J.N.H.S, Kanekar, N., and **Kurapati, S.**, *A Giant Metrewave Radio Telescope search for associated H I 21 cm absorption in high-redshift flat-spectrum sources*, 2016, MNRAS, 455, 4000, Impact Factor: 5; Q1; DOI: 10.1093/mnras/stv2563

CONFERENCE PROCEEDINGS (total: 7)

- **Kurapati, S.** , *Tracing Extraplanar and Anomalous Gas in UGCA 250 with the MHONGOOSE Survey*, IAU proceedings, 13–15 August, 2024, in press
- **Kurapati, S.** , *Tracing the Local Void and its substructure with MeerKAT*, 4th URSI AT-RASC, Gran Canaria, 19 – 24 May 2024 , IEEE, DOI: 10.46620/URSIATRASC24/WLAU3744
- Zabel, N., **Kurapati, S.**, et al. 2024 *HI at unprecedented sensitivities: the remarkable HI contents of MHONGOOSE galaxy UGCA320 and its neighbours*, IAU proceedings, 13–15 August, 2024, in press
- Louw, A., **Kurapati, S.**, et al. 2024 *Exploring the Ophiuchus Supercluster with SARAO MeerKAT Galactic Plane Survey* , IAU proceedings, 13–15 August, 2024, in press
- Kraan-Korteweg, R., Pisano, D.J., **Kurapati, S.**, et al. 2024 *New insight into dynamically important large-scale structures from the SARAO MeerKAT Galactic Plane Legacy Survey* , IAU proceedings, 13–15 August, 2024, in press
- Steyn, N. Kraan-Korteweg, R., Rajohnson, S., **Kurapati, S.**, et al. 2024 *HI galaxy signatures in the SARAO MeerKAT Galactic Plane Survey: Probing the richness of the Great Attractor wall across the inner Zone of Avoidance.*, IAU proceedings, 13–15 August, 2024, in press
- Pustilnik, S. A. et al. (including **Kurapati, S.**), *Nearby Voids and Their Galaxies: Recent Progress and Prospects*, The Multifaceted Universe: Theory and Observations, SAO RAS, 23-27 May 2022; DOI: 10.22323/1.425.0026