

## Samir Choudhuri

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CONTACT INFORMATION	Samir Choudhuri School of Physics and Astronomy Queen Mary University of London Mile End Road London E1 4NS, UK	<i>Telephone:</i> +44 (0) 20 7882 5769 (office) +44 (0) 7459152403 (Mobile) <i>E-mail:</i> s.choudhuri@qmul.ac.uk, samir.svc@gmail.com
NATIONALITY	Indian	
RESEARCH INTERESTS	Cosmic Dawn and Epoch of Reionization, 21-cm Cosmology, Low Frequency Radio Interferometry, Statistical Inference, Diffuse Synchrotron Emission	
ACADEMICS	<b>Post Doctoral Fellow, Queen Mary University of London and UC Berkley,</b> 2019-present <b>Post Doctoral Fellow, National Centre for Radio Astrophysics-TIFR,</b> India 2016-2019 <b>Ph.D., Indian Institute of Technology Kharagpur,</b> India 2011-2016 <b>M.Sc. in Physics, Jadavpur University,</b> Kolkata-India, Performance: 1st Class 2009-2011 <b>B.Sc. in Physics, Suri Vidyasagar College,</b> India, Performance: 1st Class 2006-2009	
FELLOWSHIPS AWARDS AND MEMBERSHIPS	<ul style="list-style-type: none"><li>• Fellow of the Royal Astronomical Society (FRAS) (since Feb, 2021)</li><li>• Royal Astronomical Society Undergraduate Summer Bursary (project student- Romain Pioch, Paris) (2020)</li><li>• South African Radio Astronomy Observatory (SARAO) Fellowship 2018 (declined)</li><li>• Member of the Square Kilometre Array (SKA)-International EoR science working group (since 2021)</li><li>• Member of the SKA-India “Epoch of Reionization and Cosmology” science working group (since 2015)</li><li>• CSIR-UGC, India, Junior Research Fellowship, 2011</li><li>• Qualified in Graduate Aptitude Test (GATE), 2011</li><li>• CSIR-UGC, India, Junior Research Fellowship, 2010</li></ul>	
REFEREED PUBLICATIONS	<b>Total Publications:24, First author:10, As a co-author:11, Conference proceedings:3</b> <b>Total Citations:179, h-index:6, i10-index:6</b> <ol style="list-style-type: none"><li>1. <i>Patterns of primary beam non-redundancy in close-packed 21 cm array observations</i> <b>S. Choudhuri,</b> P. Bull, H. Garsden. 2021, submitted MNRAS</li><li>2. <i>Angular power spectrum of supernova remnants: effects of structure, geometry and diffuse foreground</i> <b>S. Choudhuri,</b> P. Saha, N. Roy, S. Bharadwaj, J. Dey. 2021, MNRAS, 501, 3364</li><li>3. <i>All sky angular power spectrum: I. Estimating brightness temperature fluctuations using TGSS 150 MHz survey</i> <b>S. Choudhuri,</b> Abhik Ghosh, Nirupam Roy et al. 2020, MNRAS, 494, 1936</li><li>4. <i>An Image-based Tapered Gridded Estimator (ITGE) for the angular power spectrum</i> <b>S. Choudhuri,</b> P. Datta, S. Bharadwaj 2019, MNRAS, 483, 3910</li><li>5. <i>Turbulent power spectrum in warm and cold neutral medium using the Galactic H I 21 cm emission</i> <b>S. Choudhuri,</b> N. Roy 2019, MNRAS, 483, 3437</li><li>6. <i>Validating a novel angular power spectrum estimator using simulated low frequency radio-interferometric data</i></li></ol>	

- S. Choudhuri**, N. Roy, S. Bharadwaj, Sk. S. Ali, A. Ghosh, P. Dutta, 2017, *New Astronomy*, 57, 94
7. *The angular power spectrum measurement of the Galactic synchrotron emission in two fields of the TGSS survey*  
**S. Choudhuri**, S. Bharadwaj, Sk. S. Ali, N. Roy, H. T. Intema, A. Ghosh, 2017, *MNRAS Letters*, 470, L11
  8. *The visibility based Tapered Gridded Estimator (TGE) for the redshifted 21-cm power spectrum*  
**S. Choudhuri**, S. Bharadwaj, S. Chatterjee, Sk. S. Ali, N. Roy, A. Ghosh, 2016, *MNRAS*, 463, 4093
  9. *Tapering the sky response for angular power spectrum estimation from low-frequency radio-interferometric data*  
**S. Choudhuri**, S. Bharadwaj, N. Roy, A. Ghosh, Sk. S. Ali, 2016, *MNRAS*, 459, 151
  10. *Visibility-based angular power spectrum estimation in low-frequency radio interferometric observations*  
**S. Choudhuri**, S. Bharadwaj, A. Ghosh, Sk. S. Ali, 2014, *MNRAS*, 445, 4351

**With significant contribution:**

11. *The auto and cross angular power spectrum of the Cas A supernova remnant in radio and X-ray*  
P. Saha, S. Bharadwaj, S. Chakravorty, N. Roy, **S. Choudhuri**, H. M. Gunther, R. K. Smith, 2021, *MNRAS*, 502, 5313
12. *Stringent constraint on the radio signal from dark matter annihilation in dwarf spheroidal galaxies using the TGSS*  
A. Basu, N. Roy, **S. Choudhuri**, K. K. Datta, D. Sarkar, 2021, *MNRAS*, 502, 1605
13. *First multi-redshift limits on post-Epoch of Reionization (post-EoR) 21 cm signal from  $z = 1.96 - 3.58$  using uGMRT*  
A. Chakraborty, A. Datta, N. Roy, S. Bharadwaj, T. R. Choudhury, K. K. Datta, S. Pal, M. Choudhury, **S. Choudhuri**, P. Dutta, D. Sarkar, 2021, *Astrophysical Journal Letters*, 907, L7
14. *Demonstrating the Tapered Gridded Estimator (TGE) for the Cosmological HI 21-cm Power Spectrum using 150 MHz GMRT observations*  
S. Pal, S. Bharadwaj, A. Ghosh, **S. Choudhuri**, 2021, *MNRAS*, 501, 3378
15. *Characterizing EoR foregrounds: A study of the Lockman Hole Region at 325 MHz*  
A. Mazumder, A. Chakraborty, A. Datta, **S. Choudhuri** et al. 2020, *MNRAS*, 495, 4071
16. *A study of Kepler's supernova remnant: angular power spectrum estimation from radio frequency data*  
P. Saha, S. Bharadwaj, N. Roy, **S. Choudhuri** et al. 2019, *MNRAS*, 489, 5866
17. *Detailed study of ELAIS N1 field with the uGMRT - II. Source properties and spectral variation of foreground power spectrum from 300-500 MHz observations*  
A. Chakraborty, N. Roy, A. Datta, **S. Choudhuri** et al. 2019, *MNRAS*, 490, 243
18. *Detailed study of ELAIS N1 field with the uGMRT - I. Characterizing 325 MHz foreground for redshifted 21 cm observation*  
A. Chakraborty, A. Datta, **S. Choudhuri** et al. 2019, *MNRAS*, 487, 4102
19. *A Tapered Gridded Estimator (TGE) for the Multi-Frequency Angular Power Spectrum (MAPS) and the Cosmological HI 21-cm Power Spectrum*  
S. Bharadwaj, S. Pal, **S. Choudhuri** et al. 2019, *MNRAS*, 483, 5694
20. *Imaging the redshifted 21-cm pattern around the first sources during the cosmic dawn using the SKA*  
R. Ghara, T. Roy Choudhury, K. K. Datta, **S. Choudhuri**, 2017, *MNRAS*, 464, 2234

21. *The prospects of measuring the angular power spectrum of the diffuse Galactic synchrotron emission with SKA1 Low*  
Sk. S. Ali, S. Bharadwaj, **S. Choudhuri**, A. Ghosh, N. Roy, 2016, JOAA, 37, 35

#### Publications in Conference Proceedings

22. *The angular power spectrum measurement of the Galactic synchrotron emission using the TGSS survey*  
**S. Choudhuri**, S. Bharadwaj, Sk. S. Ali, N. Roy, H. T. Intema, A. Ghosh, 2018, Proceedings of the International Astronomical Union, 333, 157
23. *Prospects of detection of the first sources with SKA using matched filters*  
R. Ghara, T. R. Choudhury, K. K. Datta,....., **S. Choudhuri**,....., Sambit K. Giri, 2018, Proceedings of the International Astronomical Union, 333, 122
24. *Foreground simulation and power spectrum estimation for 610 MHz GMRT observations*  
**S. Choudhuri**, S. Bharadwaj, Sk. S. Ali, 2014, ASI Conference Series, 13, 315

#### MEMOS

1. #081: *1D Beam Expansion Models for the HERA Primary Beam*  
**S. Choudhuri**, P. Bull, N. Kern, 2020  
[http://reionization.org/wp-content/uploads/2013/03/HERA081-HERA\\_Primary\\_Beam-Chebyshev\\_Apr2020.pdf](http://reionization.org/wp-content/uploads/2013/03/HERA081-HERA_Primary_Beam-Chebyshev_Apr2020.pdf)

#### CONFERENCES, WORKSHOPS, PROFESSIONAL TALKS AND POSTERS

- A precursor view of the SKA Sky International Webinar (**Oral**) Mar 2021
- SKA International EoR Science Working Group monthly meeting (**Oral**) Feb 2021
- SKA India Cosmic Dwan and EoR Online seminar, India (**Oral**) Jan 2021
- Online seminar at “Packed Ultra-wideband Mapping Array (PUMA)”, USA (**Oral**) Jan 2021
- URSI National Radio Science Meeting, Univ. of Colorado, Boulder, USA (**Oral**) Jan 2021
- Hydrogen Epoch of Reionization Array (HERA) Datacon, USA (**Oral**) Dec 2020
- International webinar on “A Journey from Quark to Universe”  
Balarampur College, India (**Oral-Invited**) Sept 2020
- One-day International webinar, BB College, Asansol - India (**Oral-Invited**) June 2020
- The First Billion Years of the Universe, IIT Indore - India (**Oral-Invited**) Jan 2020
- HERA Annual Meeting, Institute of Astronomy, Cambridge, UK Sept 2019
- 21-cm Cosmology Meeting, University of Cambridge - UK (**Oral**) April 2019
- Astronomy Coffee Seminar, University of Cambridge - UK (**Oral**) April 2019
- London Relativity and Cosmology Seminar, Queen Mary, London - UK (**Oral**) April 2019
- SKA Key Science Workshop, Jodrell Bank, Macclesfield - UK (**Oral**) April 2019
- SKA General Science Meeting, Jodrell Bank, Macclesfield - UK (**Poster**) April 2019
- The Metrewavelength Sky Conference - II, NCRA, India (**Poster**) March 2019
- Frontiers in 21 cm Cosmology, Kodaikanal Solar Observatory -India (**Oral**) Dec 2018
- Lecture course on Optical/Infrared Interferometry, IUCAA-India April 2018
- ASI Annual Meeting, Osmania University -India (**Oral, Thesis Presentation**) Feb 2018
- Universe after the first 200 million years,  
Presidency University-India (**Oral-Invited**) Dec 2017
- IAU Symposium: Peering towards Cosmic Dawn, Dubrovnik-Croatia (**Oral**) October 2017
- School on EoR and 21 cm Cosmology, NCRA-India July 2017
- Astronomy Colloquium, National Centre for Radio Astrophysics (**Oral**) April 2017
- SKA 2016: Science for the SKA generation, Goa-India (**Poster**) Nov 2016
- Workshop on Epoch of Reionization, CTS, IIT Kharagpur (**Oral**) July 2016
- National Workshop on Cosmology with the HI 21-cm Line, RRI-Bangalore (**Oral**) June 2015
- Astronomy Seminar, Oskar Klein Centre, Stockholm University (**Oral**) May 2015
- The Olympian Symposium 2015, Greece (**Poster**) May 2015
- Cosmological Structures from Reionization to Galaxies, ICTP-Italy (**Oral**) May 2015
- Statistical Applications to Cosmology and Astrophysics, ISI-Kolkata (**Oral**) Feb 2015
- Workshop on Galaxies and Cosmology, NCRA-India July 2014

- 32nd Meeting Astronomical Society of India, IISER-Mohali (**Poster**) **Mar 2014**
- The Metrewavelength Sky Conference, NCRA-India (**Poster**) **Dec 2013**
- Radio Astronomy School, NCRA-India **Aug 2013**
- Workshop on Cosmology, Delhi University-India **Jan 2013**

#### STUDENT SUPERVISION AND MENTORING

##### PhD Mentorship

- Srijita Pal, PhD at Indian Institute of Technology Kharagpur, India (2015-present)
- Preetha Saha, PhD at Indian Institute of Technology Kharagpur, India (2014-present)

##### M.Sc Project Supervision

- Dimos Zografos, at Queen Mary University of London (QMUL) (2021)
- Alex Reedy, at Queen Mary University of London (QMUL) (2020)
- Romain Pioch (ENSTA Paris) (2020), Royal Astronomical Society Undergraduate Summer Bursary
- Ankur Dev at Queen Mary University of London (QMUL) (2019-2020): Now PhD at Argelander Institute for Astronomy (AIfA), Germany
- Jyotirmoy Dey at IIT Kharagpur (2015-2016): Now PhD at IIST-Trivandrum, India

#### TEACHING EXPERIENCE

- **Tutor for Radio Astronomy Data Analysis**, The First Billion Years of the Universe, IIT Indore, 27-32 Jan, 2020
- **AIPS Tutorial for Radio Data Analysis**, Radio Astronomy School 2019 at NCRA-TIFR, Pune, 19th to 30th August, 2019
- **Lectures on Power Spectrum Estimation Techniques**, School on 21-cm Cosmology at Kodaikanal Solar Observatory, 10th to 15th December, 2018
- **CASA Tutorial for radio data analysis**, School on 21-cm Cosmology at Kodaikanal Solar Observatory, 10th to 15th December, 2018
- **Computational Physics Lab**, M.Sc. Physics (1st year), IIT Kharagpur, 2013 - 2015, 3 semesters
- **Electrodynamics I**, M.Sc. Physics (1st year), IIT Kharagpur, 2013, 1 semesters
- **Preparatory Lab Class**, B.Tech. (1st year), IIT Kharagpur, 2012 - 2015, 5 semesters

#### PUBLIC SCIENTIFIC CODE

I make most of the scientific code public-available for the community. The projects are:

- **VisSim (C)**: The visibility simulator for radio interferometric observations .
- **Bare Estimator (C)**: The visibility based estimator for measuring the power spectrum from radio intrefeometric data.
- **TGE (C)**: The Tapered Gridded Estimator for angular power spectrum measurements.
- **3D-TGE (C)**: The Tapered Gridded Estimator for measuring the cylindrical and spherical power spectrum for 21cm observations.
- **I-TGE (C)**: The Image-based Tapered Gridded Estimator for angular power spectrum measurements.
- **Non-redundant pipeline (Python)**: Pipeline for simulating, calibrating, and analysing data from non-redundant arrays, based on the HERA stack.

See <https://github.com/samirchoudhuri> for details.

#### CONFERENCE AND MEETING ORGANIZATION

- Workshop & School on 21-cm Cosmology & Reionization, Main organizer, April 2021  
<https://sites.google.com/view/eorcosmology21/home>

#### COMPUTING SKILL

- **Operating Systems**: Linux, WINDOWS
- **Programming Language**: C, Python

- **Application Packages:** Numerical Recipes in C, AIPS (Astronomical Image Processing Software), CASA (Common Astronomy Software Applications), MATLAB

## REFERENCES

Available on request.

**Prof. Somnath Bharadwaj**, Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur-721302, India, E-mail: somnath@phy.iitkgp.ernet.in, somnathbharadwaj@gmail.com

**Dr. Phil Bull**, School of Physics and Astronomy, Queen Mary University of London, Mile End Road, London E1 4NS, UK, E-mail: p.bull@qmul.ac.uk, philbull@gmail.com

**Dr. Nirupam Roy**, Department of Physics, Indian Institute of Science, Bangalore 560012, India, E-mail: nroy@physics.iisc.ernet.in, roy.nirupam@gmail.com

**Prof. Tirthankar Roy Choudhury**, NCRA-TIFR, Pune University Campus, Post Bag 3, Ganeshkhind, Pune-411007, India, E-mail: tirth@ncra.tifr.res.in