

# Sriram Sankar

Email: [sriram@sao.ac.za](mailto:sriram@sao.ac.za)

Web: [sriramsankar.netlify.app](http://sriramsankar.netlify.app)

## INTERESTS

Extragalactic astrophysics, baryon cycle, gas kinematics, galaxy environments, galaxy evolution & dynamics

## FORMAL EDUCATION

### UNIVERSITY OF CAPE TOWN

MSc. Astronomy | 2021-23  
Cape Town, South Africa

### MAHATMA GANDHI UNIVERSITY

B.Tech Mechanical Engr. | 2014-18  
Kottayam, Kerala, India

## SKILLS

### Programming:

Python • IDL/GDL • C/C++ • Bash • SQL

### Workflow:

slurm • Docker/Singularity • git

### Web technologies:

HTML5/CSS3 • Hugo (JAMSTACK) • WordPress • Netlify

### Selected Astronomy tools:

Astropy • CASA • SoFiA2 • SlicerAstro  
CARTA • 3DBarolo • Cloudy • Gizmo

## TUTORING

**AST3003S:** Galactic and Extragalactic Astrophysics; third year course taught by Prof. Patrick Woudt

## OBSERVING TRAINING

### SALT Shadow Program:

Shadowed a SALT Astronomer for a week.

### SAAO 1.9m Training:

Underwent training to observe with the SpUpNIC spectrograph.

## OUTREACH

### Outreach Volunteers Club:

Started a club at SAAO for staff and students interested in outreach activities.

### Open Night Volunteer:

Regularly volunteered to organize stargazing sessions, talks, and tours

## RESEARCH EXPERIENCE

### TEL AVIV UNIVERSITY (TAU)

Visiting Research Student | Aug 2023 – Present | Tel Aviv, Israel

Supervisor: **Dr. Jonathan Stern**

- Two-month research visit to study HI warps caused by misaligned cold gas accretion. This involves using analytical methods and idealized Gizmo simulations.

### SOUTH AFRICAN ASTRONOMICAL OBSERVATORY (SAAO)

MSc Student | Feb 2021 – July 2023 | Cape Town, South Africa

Supervisors: **Dr. Moses Mogotsi & Prof. Matthew A. Bershady**

- Funded by **SALT-SAAO Prize MSc Scholarship 2021**
- Thesis:** **Kinematics of neutral hydrogen in interacting galaxies in two groups from the MeerChoirs survey.** In the two groups featuring varying levels of interactions, we characterized the kinematics of the tidal tails & bridges, warped discs, and anomalous gas.
- Proposal writing, interferometric data reduction, kinematic modelling, Gaussian decomposition of emission lines, multi-dimensional data analysis and visualisation, etc.

### INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

Project Student | Jan 2019 – Jan 2021 | Trivandrum, Kerala

Supervisor: **Prof. Anand Narayanan**

- Analyzed five oxygen rich systems at  $1.3 > z > 0.6$  along a single sightline using archival HST (COS, STIS, FOS) and Keck/HIRES data. The objective was to study multi-phase gas expected to inhabit the Circumgalactic Medium.
- Studied a multi-phase weak-Mg II analog absorber, potentially tracing an overdense region.
- UV/optical spectral data reduction and analysis, ionization modelling, database mining etc.

## REFEREED PUBLICATIONS

- Sameer, J.C. Charlton, G.G. Kacprzak, A. Narayanan, **S. Sankar**, P. Richter, B.P. Wakker, N.M. Nielson, C.W. Churchill. **"Probing the physicochemical properties of the Leo Ring and the Leo I group"** MNRAS 510 (Mar 1, 2022): 5796-5820.
- S. Sankar**, A. Narayanan, B.D. Savage, V. Khaire, B.E. Rosenwasser, J.C. Charlton, and B.P. Wakker. **"Physical conditions of five O VI absorption systems towards PG 1522 + 101"** MNRAS 498 (Sep 1, 2020): 4864-86.
- J. Pradeep, **S. Sankar**, T.M. Umasree, A. Narayanan, V. Khaire, M. Gebhardt, Sameer, and J.C. Charlton. **"Solar-metallicity gas in the extended halo of a galaxy at  $z \sim 0.12$ "** MNRAS 493, no. 1 (Mar 21, 2020): 250-66.

## TELESCOPE TIME

- MeerRings:** 2023 open time **MeerKAT proposal** to study Collisional Ring Galaxies (CRGs). **PI & Technical Lead** - Number of targets: **13 CRGs**. Total time requested: **97.5 hours**
- MeerChoirs:** 2022 open time **MeerKAT program** to study the effect of group environment on galaxy evolution. **Co-I** - Number of targets: **8 groups**. Total B time awarded: **50 hours**
- SALTChoirs:** 2021 semester 2 **RSS/SALT program** to study ionized gas in 2 Choir groups. **PI** - Total P1 time awarded: **21.4 hours**

## RECENT PRESENTATIONS

- Talk on **looking for anomalous gas in interacting galaxies** at the meeting of the **SKA Pathfinder HI Survey Coordination Committee (PHISCC)** - March 2023, Cape Town
- Lunch talk on the **neutral gas kinematics of interacting galaxies in 2 groups** at **Kapteyn Astronomical Institute, University of Groningen** - Sep 2022, Dwingeloo, Netherlands
- Short talk on the **neutral gas kinematics of interacting galaxies in a group** at **What Matters Around Galaxies (WMAG)** - Sep 2022, The Alps, Italy
- Short talk on the **Baryon Cycle in groups with varying levels of interactions** at the **Annual Conference of the South African Institute of Physics (SAIP)** - Best MSc Oral Presentation Prize in the Astrophysics division - Jul 2022, Virtual
- Short talk on the **Baryon Cycle** at the **Annual Conference of African Astronomical Society (AfAS)** - Mar 2022, Cape Town

## Visitor's Centre Exhibition:

Prepared the script for an exhibition showcasing the history of Astronomy and the role of South Africa.

## COURSEWORK

### CLASSES AUDITED <sup>1</sup>

#### UCT - NASSP Master's 2021

Extragalactic Astronomy

Radio Interferometry

#### IIST - Master's 2019

Introduction to Astronomy

Cosmology

Galaxies and Extragalactic Astronomy

#### Other

Quantum Mechanics

Statistical Mechanics

## UNDERGRADUATE

Aerospace Engineering

Gas Dynamics and Jet Propulsion

Heat and Mass Transfer

Fluid Mechanics and Thermodynamics

Engineering Physics

Engineering Mathematics (5 Semesters)

## LEADERSHIP AND

## VOLUNTEERING

### TEDXFISAT | Founding Organizer

Feb 2018 - Oct 2018 | FISAT, Kerala

Planned and organized a TEDx event with the help of a small community of volunteers.

### MECHFISAT | Founding Captain

Aug 2017 - Aug 2018 | FISAT, Kerala

Set up a department portfolio and library website. Trained a team of 50 students in various aspects of website building and content marketing.

### ASME FISAT STUDENT

SECTION | Chairman

Aug 2017 - Aug 2018 | FISAT, Kerala

Organized various events and activities in connection with ASME. Conducted several induction programs for nascent sections across the state.

## OTHER EXPERIENCE

Graphic Designing, Creative Writing, Website Development, Event Management, Amateur Music Production.



<sup>1</sup>No credits

## SCHOOLS & WORKSHOPS

### • ERIS 2022: European Radio Interferometry School

Week long summer school in September, 2022 at ASTRON, Dwingeloo, Netherlands.

### • Spectroscopy Tools Workshop by STScI

4 day virtual workshop in late March, 2022 that introduced the functionalities of various open-source spectroscopic analyses tools.

### • ARIWS 2021: African Radio Interferometry Winter School

Week long virtual interferometry school in late June, 2021.

### • ESCAPE summer school

Week long virtual school in June, 2021 on project development and data science for astrophysical research.

### • Fundamental of Gaseous Halos Workshop by KITP

2 month virtual workshop from Jan 11 to Mar 5 2021 on theoretical and observational aspects of the Circumgalactic Medium.

## OTHER ACTIVITIES

- Organiser for the fortnightly **Extragalactic Discussion Group**. - Initiated and organized the extragalactic discussion group for researchers at SAAO and UCT
- SAAO postgrad **Student Representative**. - Helped with organising writing circles, social events, meetings, and other student activities.
- Championed the **Green SAAO Sustainability Movement at SAAO**. - Worked with site management to implement a sustainable **waste management system**. Initiated **campaigns for optimal resource utilization**. Introduced **climate change communication** to outreach activities.
- Volunteer for **Astronomers for planet Earth**. - I take part in A4E activities where possible. My main project is to curate the **Advocate for Institutional Change** page in the website.

## PAST PROJECTS

### PET-CNT NANOCOMPOSITE | Team Lead

Feb 2018 - Aug 2018 | FISAT, Kerala

**Thesis Guide: Dr. Rejeesh C R**

- Attempted to recover the structural stability after iterations of plastic recycling through reinforcement with Carbon Nanotubes (CNTs). The project was intended to be a step in the direction of setting up a closed loop production system using additive manufacturing.

### GROWING CNT USING TRI-METALLIC CATALYST | Project Student

Jan 2018 | Tata Institute of Fundamental Research (TIFR), Hyderabad

**Guide: Dr. T. N. Narayanan**

- Experimented with a tri-metallic catalyst (Co-Ni-Fe) to obtain a good yield of CNT. Characterisation of the CNTs using Scanning Electron Microscope (SEM) and Raman Spectroscopy.

### EXOSKELETAL IMMOBILIZER | Team lead

Mar 2017 - Dec 2017 | FISAT, Kerala

- 3D printed fracture cast equipped with adjunct modalities to facilitate faster healing presented in Tampa, Florida and **published as part of ASME IMECE**.

## REFERENCE

**Dr. Moses Mogotsi** | [m.mogotsi@saa0.nrf.ac.za](mailto:m.mogotsi@saa0.nrf.ac.za)

SALT Astronomer, Southern African Large Telescope,  
South African Astronomical Observatory, Cape Town, South Africa

**Prof. Matthew A. Bershadsky** | [mab@saa0.ac.za](mailto:mab@saa0.ac.za)

Research Chair (SARChI), South African Astronomical Observatory,  
Adjunct Professor, University of Cape Town, Cape Town, South Africa

**Prof. Petri Vaisanen** | [petri@saa0.ac.za](mailto:petri@saa0.ac.za)

Director, South African Astronomical Observatory, Cape Town, South Africa