Suchetha Cooray

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EDUCATION AND APPOINTMENTS

- **National Astronomical Observatory of Japan, Division of Science** — Tokyo, Japan
  JSPS Postdoctoral Fellow — *Apr 2023 -*

- **Nagoya University, Doctor of Science** — Nagoya, Japan
  Division of Particle & Astrophysical Science, Graduate School of Science — *Oct 2020 - Mar 2023*

- **Nagoya University, Master of Science** — Nagoya, Japan
  Division of Particle & Astrophysical Science, Graduate School of Science — *Oct 2018 - Sep 2020*

- **Nagoya University, Bachelor of Science** — Nagoya, Japan
  Fundamental & Applied Physics Program, School of Science — *Oct 2014 - Sep 2018*

FELLOWSHIPS & AWARDS

- **Doctoral Thesis**: Accepted without revision
- **Ph.D. Professional Toryumon 2023**: *Summa Cum Laude*
- **JSPS Research Fellow (DC1), Apr 2021 - Mar 2024**: Japan Society for Promotion of Science grant number JP21J23611. Research budget: ¥2,200,000. Stipend of ¥2,400,000 per annum.
- **Ph.D. Professional Toryumon, Oct 2020 - Mar 2023**: Program for Leading Graduate Schools, Nagoya University. Research budget: ¥700,000. Stipend of ¥2,400,000 per annum.
- **Best Presenter in Science & Technology Session, Dec 2021**: Sri Lanka Students' Association Annual Research Conference 2021, Tokyo, Japan.
- **Japan Student Services Organization Scholarship, Oct 2020**: ¥1,584,000
- **Best in Sri Lanka for Computing, Jun 2014**: Cambridge International Advanced Level Examinations.
- **Most Outstanding Student of the Year 2013/2014**: Lyceum International School Wattala, Sri Lanka.

PUBLICATIONS

ORCiD is 0000-0002-9217-1696. **NASA/ADS** list can be accessed here.

- Iwasaki, D.; **Cooray, S.**; Takeuchi, T. T.; *"Extracting an Informative Latent Representation of High-Dimensional Galaxy Spectra"*, NeurIPS accepted (arXiv:2311.17414)

- Matsui, S. A.; Takeuchi, T. T.; Kono, K. T.; **Cooray, S.**; *"Photometric Observations and Period Analysis of an SU UMa-type Dwarf Nova, MASTER OT J004527.52+503213.8"*, JAAVSO, 51, 1, 111

- **Cooray, S.**; Takeuchi, T. T.; Kashino, D.; Yoshida, S. A.; Ma, H.; Kono, K. T.; *"Galaxy Manifold: Characterizing and understanding galaxies with two parameters"*, 2023, MNRAS, 524, 4, 4976

- 竹内 努, 河野 海, **Cooray, S.**, 西澤 淳, 村上 広耶, 馬 海霞, 本武 陽一, 2023, "位相的データ解析による銀河分布の定量化 とバリオン音響振動抽出", 2023, 統計数理

- **Cooray, S.**; Takeuchi, T. T.; Ideguchi, S.; Akahori, T.; Miyashita, Y.; Takahashi, K.; *"Wavelets and sparsity for Faraday tomography"*, 2023, PASJ, 75, 1, S85

- Takeuchi, T. T.; Yoshida, S. A.; Cortese, L.; Wong, O. I.; Cartinella, B.; **Cooray, S.**; *"Estimation of the Star Formation Rate of Galaxies with Radio Continuum Obtained with Murchison Widefield Array"*, submitted (arxiv:2204.00831)

- Takeuchi, T. T.; Yata, K.; Aoshima, M.; Ishii, A.; Kono, K. T.; Nakanishi, K.; Egashira, K.; **Cooray, S.**; Kohno, K.; *"High Dimensional Statistical Analysis and its Application to ALMA Map of NGC 253"*, submitted (arxiv:2203.04535)

- **Cooray, S.**; Takeuchi, T. T.; Akahori, T.; Miyashita, Y.; Ideguchi, S.; Takahashi, K.; Ichiki, K.; *"An Iterative Reconstruction Algorithm for Faraday Tomography"*, 2021, MNRAS, 500, 4, 5129
- Kono, K. T.; Takeuchi, T. T.; **Cooray, S.**; Nishizawa, A. J.; Murakami, K.; *"A study on the Baryon Acoustic Oscillation with Topological Data Analysis"*, submitted (arxiv:2006.02905)
- **Cooray, S.**; Takeuchi, T. T.; Yoda, M.; Sorai, K, *"A Method for Unmasking Incomplete Astronomical Signals: Application to CO Multi-line Imaging of Nearby Galaxies Project"*, 2020, PASJ, 72, 4, 61
- Sorai, K.; ... ; **Cooray, S.**; et. al. , *"CO Multi-line Imaging of Nearby Galaxies (COMING). IV. Overview of the project"*, 2019, PASJ, 71, 1, S14

TEACHING

- I conducted a data science tutorial in python as a master student to an international audience of more than 50 participants ranging from master students to postdoctoral researchers at the 9th East Asia School and Workshop on Laboratory, Space, and Astrophysical Plasmas.
- TA for Physics Laboratory 1, Fall 2021, Nagoya University
- TA for Physics Laboratory 2, Spring 2020, Nagoya University
- TA for Physics Laboratory 1, Fall 2020, Nagoya University
- TA for Physics Laboratory 2, Spring 2019, Nagoya University
- TA for Fundamental Physics Tutorial 2a, Spring 2019, Nagoya University
- TA for Fundamental Physics Tutorial 1a, Fall 2018, Nagoya University

SCIENTIFIC COLLABORATIONS

- **CO Multi-line Imaging of Nearby Galaxies (COMING)**: Member
- **SKA-Japan Galaxy Evolution Science Working Group**: Member
- **SKA-Japan Faraday Tomography Engineering Working Group**: Member
- **CAMELS**: Member

EXPERIENCE

- **Kavli Institute for Theoretical Physics** — Santa Barbara, USA
  Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy — Mar 2023
- **Center for Astrostatistics, Pennsylvania State University** — Online
  Summer School in Astroinformatics II — Jul 2022
- **IBM Japan Ltd.** — Nagoya, Japan
  Mentorship Program — Sep 2021 - Mar 2022
- **NEOREX Co. Ltd.** — Nagoya, Japan
  Mentorship Program — Oct 2020 - Mar 2021
- **High Energy Accelerator Research Organization (KEK)** — Tsukuba, Japan
  International KEK-Cosmo and APCosPA Winter School 2020 — Jan 2020
- **University of Edinburgh** — Edinburgh, UK
  Transferable Skills/Research Communication Training Workshop — Aug 2019
- **Center for Astrostatistics, Pennsylvania State University** — Pennsylvania, US
  Summer School in Statistics for Astronomers XV — Jul 2019
- **International Research Centre for Radio Astronomy Research** — Perth, Australia
  International Research Internship Program, University of Western Australia. — Jul 2018 - Sep 2018
  Supervised by Dr. Cullen Howlett.

Skills Summary

- **Languages**: English, Japanese, Sinhala
- **Programming languages**: Python, R, C, .NET, IDL and others
- **Others**: Author of the CRAFT code. Organizer of the Astro Students' Gathering at Nagoya University.

Seminars & Invited Talks

- **24/01/22**: Astronomical Institute Colloquium - Tohoku University: *"A Comprehensive Understanding of the Light from Galaxies"* (Confirmed)
- **24/01/09**: AI@HEP Workshop - KEK: *"AI Methods in Galaxy Formation"* (Confirmed)
- **23/11/03**: Charlie Conroy's Group Meeting - Harvard University: *"A Comprehensive Understanding of the Light from Galaxies"*
- **23/10/30**: CAS Seminar - Center for Astrophysical Sciences, John Hopkins University: *"A Comprehensive Understanding of the Light from Galaxies"*
- **23/10/27**: Galaxy Formation Group Meeting - Center for Computational Astrophysics, Flatiron Institute: *"A Comprehensive Understanding of the Light from Galaxies"*
- **23/10/26**: Astro Data Lab Seminar - Princeton University: *"A Comprehensive Understanding of the Light from Galaxies"*
- **23/10/24**: NYU CCPP Astro Seminar - New York University: *"Forward Modeling of Light from Galaxies"*
- **23/10/19**: Survey Science Group Meeting - Chicago University: *"A Forward Modeling Approach to Understanding the Light from Galaxies"*
- **23/10/16**: CPAC Seminar - Argonne National Laboratory: *"A Forward Modeling Approach to Understanding the Light from Galaxies"*
- **23/10/10**: BCCP/Cosmology Seminar - UC Berkeley: *"A Forward Modeling Approach to Understanding the Light from Galaxies"*
- **23/08/17**: KIPAC Magnetism Group Meeting - Stanford University: *"CRAFT: A New Faraday Tomography Technique"*
- **23/08/15**: KIPAC Galaxy Formation & Cosmology Group Meeting - Stanford University: *"Future of Empirical Galaxy Formation Models"*
- **23/08/08**: KIPAC Tea Talk - Stanford University: *"Simulating the Light of Observed Galaxies"*
- **23/06/13**: Physics Department Constitution Day Colloquium - Nagoya: *"Generative Models for Physics Research"*
- **23/04/12**: NAOJ Science Colloquium - Tokyo: *"Learning Representations of Galaxies"*
- **23/03/07**: SKA-Japan Workshop 2022 - Tokyo: *"Wavelets and Sparsity for Faraday Tomography"*
- **23/02/20**: SKA-Japan Webinar Series - Online: *"Galaxy Manifold with SKA"*
- **22/12/13**: IPMU Astro Lunch Seminar - Tokyo: *"Machine Learning-based Approach to Understanding Galaxies"*
- **22/11/22**: Machine Learning in Astrophysics - Nagoya: *"Understanding Galaxies through Dimensionality Reduction"*
- **21/10/12**: NECO Collaboration Teletalk - Online: *"Observing Magnetism with Faraday Tomography"*

CONFERENCE & WORKSHOP TALKS

- **23/12/12**: Observational Cosmology Workshop - Saga, Japan: *"A Flexible Galaxy Formation Model for Field-level Inference"*
- **23/11/13**: Galaxy Workshop - Tokyo, Japan: *"A New Approach to Inferring Galaxy Physical Properties"*
- **23/09/01**: HSC Medium Band Workshop - Nagoya, Japan: *"Realistic Simulation of the Light from Galaxies"*
- **23/03/22**: Galaxy Formation and Evolution in the Data Science Era - Santa Barbara, USA: *"Learning representations of galaxies from simulations and observations"*
- **23/03/15**: Spring Annual Meeting of Astronomical Society of Japan - Tokyo, Japan: *"Generative Model of Simulated Galaxies for Fitting Observed SEDs"*
- **23/02/20**: Galaxy Evolution Workshop 2022 - Kyoto, Japan: *"Fitting Simulated Galaxies to Observations"*
- **22/12/21**: Rironkon Symposium 2022 - Fukushima, Japan: *"Generative Modeling for Galaxy Star Formation Histories"*
- **22/12/12**: Observational Cosmology Workshop 2022 - Tokyo, Japan: *"A Data-driven Model of Galaxy Star Formation Histories"*
- **22/10/05**: Data Science in Astronomy 2022 - Tokyo, Japan: *"Dimensionality Reduction to Understand Galaxies"*
- **22/09/22**: 9th East Asian Numerical Astrophysics Meeting - Okinawa, Japan: *"Disentangling galaxy star formation histories"*
- **22/09/15**: Autumn Annual Meeting of Astronomical Society of Japan - Niigata, Japan: *"Disentangling the connection between present-day galaxies and their star formation histories"*
- **22/09/14**: Autumn Annual Meeting of Astronomical Society of Japan - Niigata, Japan: *"Application of machine learning in Faraday tomography"*
- **22/03/03**: Spring Annual Meeting of Astronomical Society of Japan - Online: *"Reconstructing Galaxy Star Formation History with Present-day Galaxy Manifold"*
- **22/03/02**: Spring Annual Meeting of Astronomical Society of Japan - Online: *"Wavelets and sparsity for solving the inverse problem in Faraday tomography"*
- **22/02/16**: First Stars and First Galaxies Workshop 2021 - Tokyo & Online: *"Time Evolution on the Galaxy Manifold"*
- **22/02/08**: Galaxy Evolution Workshop 2021 - Tokyo & Online: *"Galaxy Manifold: A Unification of Observed Galaxy Properties"*
- **21/12/11**: Sri Lanka Students' Association in Japan Annual Research Conference - Online: *"Unmasking the unseen"*
- **21/12/02**: Galactic Star Formation 2021 - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **21/09/15**: Autumn Annual Meeting of Astronomical Society of Japan - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **21/03/19**: SKA Science Conference, "A precursor view of the SKA Sky" - Online: *"An Iterative Reconstruction Algorithm for Faraday Tomography"*
- **21/03/18**: Spring Annual Meeting of Astronomical Society of Japan - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **21/02/05**: Galaxy Evolution Workshop 2020 - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **20/12/01**: Science at Low Frequencies VII (SALF VII) - Online: *"An Iterative Reconstruction Algorithm for Faraday Tomography"*
- **20/11/18**: First Stars and First Galaxies Workshop 2020 - Sendai, Japan: *"Understanding Galaxy Evolution through Machine Learning"*
- **20/11/09**: ADASS XXX - Online: *"An Iterative Reconstruction Algorithm for Faraday Tomography"*
- **20/09/14**: The Physical Society of Japan, Autumn Meeting 2020 - Online: *"An Iterative Reconstruction Algorithm for Faraday Tomography"*

- **20/09/09**: Autumn Annual Meeting of Astronomical Society of Japan - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **20/06/09**: SAZERAC 2020 - Online: *"Understanding Galaxy Evolution through Machine Learning"*
- **20/03/17**: Spring Annual Meeting of Astronomical Society of Japan - Tsukuba, Japan: *"Understanding Galaxy Evolution through Machine Learning"*
- **19/11/21**: SKA-Japan science workshop "Cosmic Magnetism" 2019 - National Observatory of Japan, Mitaka, Japan: *"A Reconstruction Method for Faraday Tomography in SKA Cosmic Magnetism"*
- **19/11/12**: First Stars and Galaxies Workshop - Nagoya University, Nagoya, Japan: *"Understanding Galaxy Evolution through Machine Learning"*
- **19/09/13**: Autumn Annual Meeting of Astronomical Society of Japan - Kumamoto University, Kumamoto, Japan: *"A Method for Reconstruction of Masked Pixels: Application in CO Multi-line Imaging of Nearby Galaxies (COMING)"*
- **19/09/05**: SKA-Japan Symposium 2019 - National Observatory of Japan, Mitaka, Japan: *"A Reconstruction Method for Faraday Tomography in SKA Cosmic Magnetism"*
- **19/05/29**: Data Science Methods in Astronomy 2019 - Institute of Statistics and Mathematics, Tachikawa, Japan: *"Data Reconstruction Methods in Astrophysics and Cosmology"*
- **18/12/09**: Sri Lanka Students' Association in Japan Annual Research Conference - Tokyo, Japan: *"Reconstruction of Masked Astronomical Images"*
- **18/12/04**: Science at Low Frequencies V (SALF V) - Nagoya, Japan: *"Reconstruction of Masked Images in Radio Observations: Application in CO Multi-line Imaging of Nearby Galaxies Project as Nobeyama Radio Observatory"*
- **18/11/05**: The 8th KIAS Workshop on Cosmology and Structure Formation - Seoul, South Korea: *"An Iterative Data Reconstruction Method for Incomplete Measurements in All-Sky Surveys"*
- **18/09/19**: Autumn Annual Meeting of Astronomical Society of Japan - Himeji, Japan: *"An Iterative Data Reconstruction Method for Incomplete Measurements in All-Sky Surveys"*
- **18/06/06**: 5th Galaxy Evolution Workshop - Ehime, Japan: *"An Iterative Data Reconstruction Method for Incomplete Measurements in All-Sky Surveys"*
- **17/12/10**: Sri Lanka Students' Association in Japan Annual Research Conference - Tokyo, Japan: *"Large Scale Mapping of the Nearby Universe with Data from Large Galaxy Surveys"*
- **17/06/18**: International Conference on Asian Studies - Ottawa, Canada *"Large Scale Mapping of the Nearby Universe with Data from Large Galaxy Surveys"*