Arkaprabha Sarangi, Ph.D.

Assistant Professor
Indian Institute of Astrophysics

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My field of study focuses on evolved stars, specifically on transients such as stellar outbursts and supernova explosions, and their role in the life cycle of cosmic dust in the universe. I am currently the lead investigator on several James Webb Space Telescope projects related to supernova dust.

Academic Positions

Assistant Professor **Jul 2024 – Present**
Indian Institute of Astrophysics,
Bangalore, India

Assistant Professor, Researcher **Nov 2019 – Jun 2024**
Niels Bohr Institute, DARK division,
University of Copenhagen, Denmark

Research Associate **Apr 2015 – Oct 2019**
NASA Goddard Space Flight Center, Astrophysics Science Division
Code 665, Greenbelt, Maryland, United States
Supervisor: **Dr. Eli Dwek**

Doctor of Philosophy (Ph.D. Astronomy) **Nov 2010 – Nov 2014**
University of Basel, Switzerland
Thesis adviser: **Dr. Isabelle Cherchneff**
Thesis title: Dust formation and evolution in the ejecta of core-collapse supernovae
Grade: **summa cum laude** (Highest Distinction)

Master of Science (M.Sc Physics) **Jul 2008 – Aug 2010**
Indian Institute of Technology Bombay, Mumbai, India
Master's Thesis: Professor. S. H. Patil, CPI: 8.6/10

Bachelor of Science (B.Sc Physics) **Aug 2005 – Jun 2008**
Presidency College Kolkata
Score: 73.4% [First Class] (rank: 6th/approx.4000)

Visiting Researcher

Affiliated Visiting Professor **Jun 2024 – Present**
Niels Bohr Institute, DARK division, Copenhagen, Denmark

Affiliated Visiting Professor **Aug 2021 – Present**
Chalmers Institute of Technology, Gothenburg, Sweden

Visiting Researcher **Jan 2015 – Mar 2015**
Max Planck Institute for Astrophysics, Germany

Visiting Fellow **June 2010 – Sep 2010**
Weizmann Institute of Science, Rehovot, Israel
Team: **CERN ATLAS detector**

Scholastic Achievements

- Delivered over 14 invited talks in international conferences.
- Winner of 4 JWST proposals as Co-I in JWST cycle-2 program.
- Press release - Discovery of large mass of dust in extragalactic supernovae: NASA Webb (`https://webbtelescope.org/`); News article on achievements and discoveries published by Indian Newspaper *Anandabazar Patrika* on Sunday July 16, 2023.
- Written 2 book chapters in the book 'Supernovae', Springer, Space Science Reviews Series.
- Reviewer of 19 articles and 2 proposals (Journals: MNRAS, ApJ, Science Advances)
- Won The NASA Astrophysics Theory Proposal (ATP) grant, 2017
- Awarded the Swiss National Science Foundation (SNSF) Early Career Mobility Grant, 2015
- Organizer of 3 international conferences: (a) Conference: Origin and Fate of Cosmic Dust, Gothenburg, Sweden, 2023 (b) European Astronomical Society Annual meeting (EWASS), Session SS6, Liverpool, UK, 2018 (c) Conference: Dust in core-Collapse supernovae near & far, Ascona, Switzerland, 2012.
- Supervised Masters student, Ruiyu Pan (Copenhagen University), Abantika Ghosh (Calcutta University).
- Public outreach: *youtube-live: Science beyond books* for high school and college freshers, 2021
- Delivered an introductory astronomy course "The journey of Astronomy" at the Online teaching platform 'tritiyoparisar' based in India, Sep - Dec 2021
- Completed course: 'Introduction to University Pedagogy' at Copenhagen University, and obtained a certification on 'Leading for Equity, Diversity and Inclusion in Higher Education', from the University of Michigan
- Artist-scientist collaboration in Copenhagen, Arka Sarangi (me) and artist Cecilie Falkenstrom created an artwork titled 'Made of Stardust', based on scientific data, being displayed in Copenhagen centre, Sifs Plads.

Reviewer

- The Astrophysical Journal (ApJ) - 4 article
- Science Advances - 1 article
- Monthly Notices of the Royal Astronomical Society (MNRAS) - 14 articles
- Distributed Research utilizing Advanced Computing (DiRAC) - Proposal review

Teaching & Assistantship

- Gravitational Dynamics and Galaxy Formation • Journey of Astronomy and its Branches
- Symmetries and Fields • Electrodynamics • Astrophysics and Cosmology
- Classical Mechanics • General relativity • Thermodynamics

International Collaborators

- Comic dust group at the Chalmers University, Sweden (affiliated at visiting researcher)
- JWST-2n Dust in supernovae, based in Space Telescope Science Institute, Baltimore
- Young Supernova Experiment – large transient survey program
- Several individual collaborations across universities and research groups.

References

Dr. Jonathan D Slavin
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Dr. Ori Fox
Space Telescope Science Institute
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Chalmers University of Technology
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Niels Bohr Institute, University of Copenhagen
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Peer reviewed publication

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Google Scholar: https://scholar.google.com/citations?user=qwoidhEAAAAJ&hl=en&oi=ao

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2. "JWST Discovery of Dust Reservoirs in Nearby Type IIP Supernovae 2004et and 2017eaw", M. Shahbandeh, A. Sarangi, et al. *Monthly Notices of the Royal Astronomical Society,* vol. 523, issue 4, pg 6048, 2023
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3. "The Young Supernova Experiment Data Release 1 (YSE DR1): Light Curves and Photometric Classification of 1975 Supernovae", P. Aleo et al. *The Astrophysical Journal Supplement Series,* vol. 266, issue 1, id: 9, 2023
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4. "Formation, Distribution, and IR emission of Dust in the Clumpy Ejecta of Type II-P Core-collapse Supernovae, in Isotropic and Anisotropic Scenarios", A. Sarangi, *Astronomy & Astrophysics,* vol. 668, A57, 2022
https://www.aanda.org/articles/aa/full_html/2022/12/aa44391-22/aa44391-22.html

5. "Dust Production in a Thin Dense Shell in Supernovae with Early Circumstellar Interactions", A. Sarangi & Slavin, J., *The Astrophysical Journal,* vol. 933, issue 1, id: 89, 2022
https://iopscience.iop.org/article/10.3847/1538-4357/ac713d

6. "The Infrared Echo of SN2010jl and its Implications For Shock Breakout Characteristics", E. Dwek, A. Sarangi, R. Arendt, T. Kallman, D. Kazanas & O. Fox *The Astrophysical Journal,* vol. 917, issue 2, id: 84, 2021
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7. "The Young Supernova Experiment: Survey Goals, Overview, and Operations", D. Jones, et al. *The Astrophysical Journal,* vol. 908, issue 2, id: 143, 2021
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https://iopscience.iop.org/article/10.3847/1538-4357/ab46a9

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https://iopscience.iop.org/article/10.3847/1538-4357/aabfc3

13. "New Insights on What, Where, and How Dust Forms in Evolved Stars", I. Cherchneff & A. Sarangi *The B[e] Phenomenon: Forty Years of Studies, ASP Conference Series* 508, 57, 2017
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14. "Dust formation in the oxygen-rich AGB star IK Tauri", D. Gobrecht, I. Cherchneff, A. Sarangi, J. M. C. Plane & S. T. Bromley, *Astronomy & Astrophysics,* 585, A6, 2016
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