

SIDDHARTH CHAINI

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EDUCATION

University of Delaware

Newark, DE, USA

Ph.D. in Physics and Astronomy (*GPA: 3.96/4.0*)

Sep. 2022 – Apr. 2027 (expected)

Advisor: Federica B. Bianco

Dissertation: “*Discovering Structure and Surprise in Time-Domain Astrophysics*”

Indian Institute of Science Education and Research (IISER) Bhopal

Bhopal, India

BS-MS (Dual Degree) in Physics (*CPI: 9.04/10*)

Aug. 2017 – May 2022

PUBLICATIONS



* marks equal contribution; author lists beyond three names are shortened to “et al. (incl. S. Chaini)”.

First-Author Publications

- [6] **S. Chaini**, F. B. Bianco, and A. Mahabal, “Probabilistic Data-Driven Modelling of Astrophysical Transients: The Neural Process Family for Ultrafast and Class-Agnostic Light Curve Reconstruction with NightLANP,” *arXiv e-prints*, May 2026. arXiv: [2605.27527](https://arxiv.org/abs/2605.27527).
Also: ICML 2026 Workshop on AI for Physics [\[OpenReview\]](#).
- [5] **S. Chaini**, F. B. Bianco, and A. Mahabal, “In Search of the Unknown Unknowns: A Multi-Metric Distance Ensemble for Out of Distribution Anomaly Detection in Astronomical Surveys,” *arXiv e-prints*, Oct. 2025. arXiv: [2510.23702](https://arxiv.org/abs/2510.23702).
- [4] B. Domínguez*, **S. Chaini***, K. Mrakovčić*, et al., “Validation of the Bond et al. (2010) SDSS-derived kinematic models for the Milky Way’s disk and halo stars with Gaia Data Release 3 proper motion and radial velocity data,” *A&A*, vol. 688, A132, Aug. 2024, Art. no. A132. DOI: [10.1051/0004-6361/202449653](https://doi.org/10.1051/0004-6361/202449653). arXiv: [2406.03541](https://arxiv.org/abs/2406.03541).
- [3] **S. Chaini**, A. Mahabal, A. Kembhavi, et al., “Light curve classification with DistClassiPy: A new distance-based classifier,” *Astronomy and Computing*, vol. 48, p. 100850, Jul. 2024, Art. no. 100850. DOI: [10.1016/j.ascom.2024.100850](https://doi.org/10.1016/j.ascom.2024.100850). arXiv: [2403.12120](https://arxiv.org/abs/2403.12120).
- [2] **S. Chaini**, A. Bagul, A. Deshpande, et al., “Photometric identification of compact galaxies, stars, and quasars using multiple neural networks,” *MNRAS*, vol. 518, no. 2, pp. 3123–3136, Jan. 2023. DOI: [10.1093/mnras/stac3336](https://doi.org/10.1093/mnras/stac3336). arXiv: [2211.08388](https://arxiv.org/abs/2211.08388).
- [1] **S. Chaini** and S. S. Kumar, “Astronomical Classification of Light Curves with an Ensemble of Gated Recurrent Units,” *arXiv e-prints*, Jun. 2020. arXiv: [2006.12333](https://arxiv.org/abs/2006.12333).

Major Co-Author Contributions

- [1] N. Earl, **S. Chaini**, K. D. French, et al., “NAPTIME: A Neural-Process Framework for Rubin Alert Classification,” *arXiv e-prints*, Jul. 2026. arXiv: [2607.19236](#).

Collaboration & Co-Authored Publications

- [3] C. R. Bom, A. Mahabal, F. Bianco, et al. (incl. **S. Chaini**), “Toward decision-aware AI for LSST-scale time-domain astronomy,” *arXiv e-prints*, Jun. 2026. arXiv: [2606.05285](#).
Rubin LSST Transients and Variable Stars Science Collaboration.
- [2] E. J. Honaker, J. E. Gizis, C. Aganze, et al. (incl. **S. Chaini**), “Searching for Ultracool Dwarfs in Early LSST Data Products,” *ApJ*, vol. 1004, no. 2, p. 214, Jun. 2026, Art. no. 214. DOI: [10.3847/1538-4357/ae6ce9](#). arXiv: [2604.08387](#).
- [1] C. L. Ransome, B. M. Subrayan, D. J. Sand, et al. (incl. **S. Chaini**), “First Results from the LSST Shadow Survey: The Restless Luminous Blue Variable AT2017des in the Virgo-Cluster Galaxy, NGC4532,” *arXiv e-prints*, Jun. 2026. arXiv: [2606.23784](#).

Software

- [3] **S. Chaini**, F. B. Bianco, and A. Mahabal, “*NightLANP*”, GitHub repository, Jun. 2026. [Online]. Available: <https://github.com/sidchaini/NightLANP/>.
- [2] **S. Chaini**, F. B. Bianco, and A. Mahabal, “*keras-neural-processes*”, GitHub repository, Nov. 2024. [Online]. Available: <https://github.com/sidchaini/keras-neural-processes/>.
- [1] **S. Chaini**, A. Mahabal, A. Kembhavi, et al., “*DistClassiPy*”, Astrophysics Source Code Library, record ascl:2403.002, Mar. 2024. [Online]. Available: <https://github.com/sidchaini/DistClassiPy/>.

FELLOWSHIPS, HONORS AND AWARDS

- Future Investigators in NASA Earth and Space Science and Technology (FINESST), *NASA* 2025 – 2027
- Doctoral Fellowship for Excellence, *University of Delaware* 2025 – 2026
- NSF Research Grant (Co-author; PI: F. B. Bianco), *National Science Foundation* 2025 – 2028
- LINCC Frameworks Community Event Support, *LSST Discovery Alliance* 2026
- **Data Science Institute Fellow**, *University of Delaware* 2023 – Present
- Vatican Observatory Scholarship, *18th Vatican Observatory Summer School* 2023
- **INSPIRE** Scholarship for Higher Education, *DST, Government of India* 2017 – 2022

OBSERVING EXPERIENCE

- **Dark Energy Camera (DECam)**, Cerro Tololo Inter-American Observatory 2 nights
Remote Observer for the DECam Shadow project

ACADEMIC SERVICE

- **Elected Member**, LSST ISSC Executive Council Jun. 2026 – Present
Informatics and Statistics Science Collaboration — oversight of working groups, committee appointments and collaboration policies
- **Co-Chair**, LSST TVS Anomalies Subgroup Sep. 2024 – Present
Rubin LSST Transients and Variable Stars Science Collaboration — organize meetings and coordinate subgroup activities
- **Organizing Committee**, *LSST is here!* DP2 Hackathon Aug. 2026
Co-organized a 2-day hackathon on Rubin Observatory's LSST Data Preview 2 (DP2) data and tools
- **Rubin TVS Software Taskforce Instructor** Aug. 2026
Instructor for multiple workshops, Rubin TVS Software Taskforce
- **Elected Head**, Student Research Group, IISER Bhopal Astronomy Club Aug. 2020 – Aug. 2021
In charge of group activities and data analysis — image reduction and CCD photometry

TALKS AND PANELS

- Rubin Community Workshop 2026 — Contributed talk Jul. 2026
Fast, Probabilistic Modelling for the LSST Alert Stream: Interpolating Sparse Multiband Light Curves with Neural Processes
- The Extragalactic Transient Universe — Contributed talk Jul. 2026
Probabilistic Modelling of Transient Light Curves with Neural Processes
- European Astronomical Society Annual Meeting — Contributed talk Jun. 2026
Using neural processes to model sparse light curves for LSST-like transients
- American Physical Society Global Physics Summit — Contributed talk Mar. 2026
Tackling Sparse, Multiwavelength Light Curves in Time-Domain Astronomy with Neural Processes
- TDABench — Contributed talk Mar. 2026
The Need for a Light Curve Interpolation and Forecasting Benchmark Dataset
- Quasar Bazaar Hackweek — **Invited talk** (remote) Feb. 2026
Distance Multi-Metric Anomaly Detection (DiMMAD)
- NCRA Astronomy Seminar — **Invited talk** Jan. 2026
Transient hunting in the era of large-sky surveys with Neural Processes
- LSST@Europe 7 — **Contributed talk** Sep. 2025
Tackling LSST's sparse multiband light curves with Neural Processes
- Rubin Community Workshop 2025 — **Contributed talk** Jul. 2025
Hunting for Anomalies with Distance Metrics for LSST
- Shaping the Future of Time-Domain Astronomy with LSST — Contributed talk May 2025
Anomalies in the time-domain: Machine learning with distance metrics
- AI/ML Applications in Astronomy and Astrophysics — Panel discussion Jan. 2025
Pitfalls of using ChatGPT

- AI/ML Applications in Astronomy and Astrophysics — [Hands-on tutorial](#) Jan. 2025
Leveraging Distance Metrics for Better Machine Learning
- LSST TVS — [Colloquium](#) Oct. 2024
Distance Metrics for Machine Learning in Time-Domain Astronomy with DistClassiPy
- LSST@Europe 6 — [Contributed talk](#) Sep. 2024
Leveraging Distance Metrics for Machine Learning in Astronomy: DistClassiPy
- Rubin Community Workshop 2024 — [Contributed talk](#) Jul. 2024
DistClassiPy: Distance-Based Techniques for Classification and Anomaly Detection in Light Curves

POSTERS

- European Astronomical Society Annual Meeting 2026 — Poster Jul. 2026
What physics can we find in the data-driven manifolds of supernovae spectra?
- IAU Symposium 406: Future landscape of astrophysical transients — [Poster](#) May 2026
Attentive Neural Processes model LSST-like transient light curves more accurately — and 100,000× faster — than Gaussian Processes
- NeurIPS 2025, *Machine Learning and the Physical Sciences* — [Poster](#) Dec. 2025
DiMMAD: In Search of the Unknown Unknowns — A Multi-Metric Distance Ensemble for Out-of-Distribution Anomaly Detection in Astronomical Surveys
- Data Science & DARWIN Computing Symposium — Poster Apr. 2025
- Rare Gems in Big Data — [Poster](#) May 2024
DistClassiPy: A New Distance-Based Classifier
- 2023 Annual Meeting of the APS Mid-Atlantic Section — [Poster](#) Nov. 2023
Light curve classification using distance metrics
- 2023 Delaware Data Science Symposium — Poster Sep. 2023
- 40th Meeting of the Astronomical Society of India — [Poster](#) Mar. 2022
Photometric classification of compact galaxies, stars and quasars using multiple neural networks
- 2021 Institut d'Astrophysique de Paris Colloquium — [Poster](#) Oct. 2021
Photometric classification of faint & compact galaxies, stars and quasars using multiple neural nets

MENTORING

- Co-mentored three Lincoln University undergraduates May 2026 – Aug. 2026
Abdourahim Sylla, Agustina Lorda and Adeoluwa Afolabi
- Co-mentored UD undergraduate NASA Space Grant Fellow Jul. 2023 – Aug. 2024
Ibrahim Wilson

TEACHING EXPERIENCE

- **Lesson Instructor**, Rubin LSST TVS Science Collaboration Jul. 2024 – Present
Intermediate Python for Astronomical Software Development
Research Software Engineering Mini Course

- **Teaching Assistant**, University of Delaware Sep. 2022 – Aug. 2024
PHYS 207, PHYS 208, PHYS 227, SCEN 101
- **Teaching Assistant**, IISER Bhopal Jan. 2019 – May 2019
ECS 102: Introduction to Programming

OUTREACH

- **Rubin First Look** at the University of Delaware
 - Co-led the effort to organize a public viewing party in Delaware for the first look at Rubin images
 - Presented Rubin LSST’s goals and science to the public
- **Astronomy Club** at IISER Bhopal
 - Organized telescope viewing nights for the IISER Bhopal community
 - Organized programming tutorials on computational astronomy for IISER Bhopal students
- **Outreach talks** at local tutoring centres in Thane, India
 - Gave science talks to students in grades 8–10, sharing insights and inspiring interest in science and astrophysics

MEDIA COVERAGE

- UDaily, “*NASA’s next generation of scientists*” Oct. 2025
- UDaily, “*Opening a new window into the Universe*” Jun. 2025
- Franciscan Media, “*Vatican hosts astronomers of tomorrow for summer school*” [also on [YouTube](#)] Jun. 2023

TECHNICAL SKILLS

Languages	Python, C, C++, Java, Wolfram Language, SQL, HTML, Bash, Assembly, L ^A T _E X
Libraries	Astropy, NumPy, pandas, scikit-learn, PyTorch, TensorFlow, Keras, Matplotlib, Selenium
Software	Mathematica, SAOImage DS9, Aperture Photometry Tool
Dev tools	Git, Jupyter, VS Code

REFERENCES

- **Federica B. Bianco** (University of Delaware) — *PhD advisor* fbianco@udel.edu
- **Ashish Mahabal** (Caltech) — *MS thesis advisor, collaborator* aam@astro.caltech.edu
- **Ajit Kembhavi** (IUCAA, Pune) — *MS thesis advisor* akk@iucaa.in
- **Johann Cohen-Tanugi** (LPCA, CNRS/IN2P3) — *supervisor* johann.cohen-tanugi@lupm.in2p3.fr