

SANJANA CURTIS

@ sanjanacurtis@berkeley.edu i sanjana-curtis.com t @sanjanacurtis

EDUCATION

- 8/15 to 11/20 **PhD in Physics**, North Carolina State University, Raleigh. (*PhD Defended : Oct 29th, 2020*)
8/13 to 7/15 **Master's Degree in Physics**, North Carolina State University, Raleigh.
6/09 to 6/13 **Bachelor's Degree in Electrical and Electronics Engineering**, PES University, Bangalore.

EXPERIENCE

- 09/23 to Present **NSF Postdoctoral Fellow, DEPARTMENT OF ASTRONOMY, University of California, Berkeley**
> Mentor : Dr. Daniel Kasen; Research : End-to-end modeling of the kilonova zoo
compact object mergers nucleosynthesis numerical simulations multi-messenger astrophysics kilonovae
- 04/22 to 08/23 **Postdoctoral Researcher, DEPARTMENT OF ASTRONOMY AND ASTROPHYSICS, University of Chicago**
> Mentor : Dr. Alexander Ji; Research : Inferring massive star properties from abundance ratios
core-collapse supernovae nucleosynthesis numerical simulations multi-messenger astrophysics kilonovae
- 12/20 to 02/2022 **Postdoctoral Researcher, ANTON PANNEKOEK INSTITUTE FOR ASTRONOMY, University of Amsterdam**
> Mentor : Dr. Philipp Mösta; Research : Nucleosynthesis and kilonovae from binary neutron star mergers, hypermassive neutron star remnants, M1 neutrino transport in GRMHD simulations
multi-messenger astrophysics core-collapse supernovae compact object mergers numerical simulations
- 10/19 to 10/20 **Graduate Research Assistant, CENTER FOR NONLINEAR STUDIES, Los Alamos National Lab**
> Mentor : Dr. Jonah Miller; Research : Nucleosynthesis and kilonovae from black hole-neutron star post-merger disks, accretion disk physics and dynamics
black hole-neutron star mergers accretion disks r-process nucleosynthesis radiation transport
- 8/15 to 11/20 **Research Assistant, DEPARTMENT OF PHYSICS, North Carolina State University**
> Advisor : Dr. Carla Fröhlich; Research : Nucleosynthesis and transients from core-collapse supernovae, monte-carlo neutrino transport in binary neutron star mergers
core-collapse supernovae neutron star mergers nucleosynthesis monte-carlo neutrino transport
- 8/13 to 7/15 **Teaching Assistant, DEPARTMENT OF PHYSICS, North Carolina State University**
> PY206 (Physics lab for Engineers); PY452 (Senior lab for Physics majors)
mechanics laboratory advanced physics laboratory

AWARDS AND HONORS

- 2019 **Outstanding Graduate Research Assistant**, Department of Physics, NC State University
2018 **Murarka Graduate Student Award**, Department of Physics, NC State University
2018 **Best Poster**, 15th International Symposium on Nuclei in the Cosmos (NIC XV)
2009–2013 **Eight Distinction Awards (one per semester)**, PES Institute of Technology

RESEARCH GRANTS

- 2023 NSF Astronomy and Astrophysics Postdoctoral Fellowship
2022 \$4,500 research visit support from the International Research Network for Nuclear Astrophysics (IReNA)
2019 Co-PI on proposal selected for funding by the Center for Space and Earth Science (CSES) Rapid Response Program
Title : Blue Kilonova from Black Hole-Neutron Star Disks; Authors : J. Miller, J. Dolence and S. Curtis

FIRST-AUTHOR PUBLICATIONS

- [6] S. Curtis, P. Bosch, P. Mösta et al. 2023; Outflows from Short-Lived Neutron-Star Merger Remnants Can Produce a Blue Kilonova. *ApJL* 961 L26 (2024)
- [5] S. Curtis, J. M. Miller, C. Fröhlich et al.; Nucleosynthesis in Outflows from Black Hole-Neutron Star Merger Disks With Full GRMHD. *ApJL* 945 L13 (2023)
- [4] S. Curtis, Philipp Mösta, Z. Wu et al.; r-process Nucleosynthesis and Kilonovae from Hypermassive Neutron Star Remnants. *MNRAS* 0035-8711 (2022)
- [3] S. Curtis, N. Wolfe, C. Fröhlich et al.; Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra. *ApJ* 921 143 (2021)
- [2] K. Ebinger & S. Curtis (joint 1st author) et al. ; PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry IV : Explodability, Remnant Properties and Nucleosynthesis Yields of Low Metallicity Stars. *ApJ*, 888, 91 (2020)
- [1] S. Curtis, K. Ebinger, C. Fröhlich et al. ; PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry III : Nucleosynthesis Yields. *ApJ*, 870, 2 (2019)

ADDITIONAL PUBLICATIONS

- [4] A. Ji, S. Curtis, N. Storm et al.; Spectacular nucleosynthesis from early massive stars. *ApJL* 961 L41 (2024)
- [3] S. de Haas, P. Bosch, P. Mösta, S. Curtis, et al.; Magnetic field effects on nucleosynthesis and kilonovae from neutron star merger remnants. *MNRAS* 523 2931 (2023)
- [2] C. Fröhlich, S. Curtis, K. Ebinger et al. ; Nucleosynthesis for SN 1987A from Single-star and Binary-merger Progenitors. *J. Phys. G*, 46, 084002 (2019)
- [1] K. Ebinger, S. Curtis, C. Fröhlich et al.; PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry II : Explodability and Remnant Properties. *ApJ*, 870, 1 (2019)

INVITED CONFERENCE TALKS AND COLLOQUIA

- 2023 **Colloquium**, University of New Hampshire, NH, USA
Title : Heavy Element Nucleosynthesis and Kilonovae from Compact Object Mergers
- 2023 **Invited talk**, Bashfest, UT Austin, Austin, TX, USA
Title : Heavy Element Nucleosynthesis and Kilonovae from Compact Object Mergers
- 2023 **Invited talk**, Zwicky Transient Facility (ZTF) Theory Network Meeting, Oak Creek Ranch
Title : Nucleosynthesis and Light Curves of Core-Collapse supernovae
- 2023 **Colloquium**, University of Maryland, College Park
Title : Heavy Element Nucleosynthesis and Kilonovae from Compact Object Mergers
- 2023 **Invited talk**, Frontiers Summer School, MSU
Title : Explosive Nucleosynthesis
- 2023 **Invited talk**, PCTS Workshop on Post-Merger Remnants, Princeton
Title : Nucleosynthesis and Kilonovae from Post-Merger Remnants
- 2022 **Invited talk**, EMMI+IRENA Workshop on Remnants of Neutron-Star Mergers, GSI, Darmstadt, Germany
Title : Heavy Element Nucleosynthesis and Kilonovae from Compact Object Mergers
- 2022 **Colloquium**, Carnegie Observatories, Pasadena, CA, USA
Title : Heavy Element Nucleosynthesis and Kilonovae from Compact Object Mergers
- 2022 **Colloquium**, Carleton College, Northfield, Minnesota, USA
Title : Astrophysical Explosions and the Origin of Chemical Elements
- 2022 **Invited talk**, SNEWS 2022 Collaboration Meeting, Lafayette, Indiana, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2022 **Invited talk**, APS April Meeting, NYC, USA
Title : Heavy Element Nucleosynthesis in Neutron Star Mergers
- 2020 **Colloquium** (virtual), Oregon State University, Corvallis, Oregon, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2020 **Colloquium** (virtual), Davidson College, Davidson, NC, USA
Title : Core-Collapse Supernovae : Element Synthesis, Light Curves and Spectra
- 2019 **Invited talk**, Microphysics In Computational Relativistic Astrophysics (MICRA), Jena, Germany
Title : Nucleosynthesis in Core-Collapse Supernovae

INVITED SEMINARS

- 2023 **Cosmology Seminar**, UC Davis
Title : Core-Collapse Supernovae : Connecting Massive Progenitors to Nucleosynthesis Yields and Light Curves
- 2023 **Seminar**, Explosive Astro, UC Berkeley
Title : Heavy element nucleosynthesis and kilonovae from compact object mergers
- 2023 **Seminar**, Time-Domain Summer Journal Club, Northwestern University
Title : Outflows from Short-Lived Neutron-Star Merger Remnants Can Produce a Blue Kilonova
- 2023 **Seminar**, Departamento de Astronomia IAG-USP
Title : Core-Collapse Supernovae : Explosions, Nucleosynthesis, and Transients
- 2023 **TUNL Seminar**, Triangle Universities Nuclear Lab, Durham, USA
Title:Neutrinos, Nucleosynthesis and Kilonovae
- 2022 **Los Alamos Astrophysics Distinguished Seminar Series**, LANL
Title : Black Hole-Neutron Star Mergers and the Origin of Heavy Elements
- 2022 **Astrophysics/HEP Seminar** (virtual), University of Tennessee, Knoxville, USA
Title : Astrophysical Explosions and the Origin of Chemical Elements
- 2022 **TAC Seminar** (virtual), UC Berkeley
Title : Heavy Element Nucleosynthesis and Kilonovae from Hypermassive Neutron Star Remnants
- 2021 **EPAP Seminar** (virtual), King's College, London, UK
Title : Neutrinos and Nucleosynthesis in Core-Collapse Supernovae
- 2021 **CCAPP Seminar** (virtual), The Ohio State University, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2021 **Transient Tuesdays** (virtual), Copenhagen, Denmark
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2021 **Monday Science Seminar** (virtual), University of Wisconsin-Madison, WI, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2020 **BigBoom Seminar** (virtual), University of Arizona, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2020 **Seminar** (virtual), Stony Brook University, New York, USA
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2020 **Seminar**, International Research Network for Nuclear Astrophysics (IReNA) Online Seminar
Title : Core-Collapse Supernovae : From Neutrino-Driven 1D Explosions to Light Curves and Spectra
- 2019 **Seminar**, University of Minnesota, Twin Cities, Minneapolis, USA
Title : Nucleosynthesis in Core-Collapse Supernovae
- 2019 **Seminar**, Theoretisch-Physikalisches Institut, Jena, Germany
Title : Neutrino-Matter Interactions in Neutron Star Mergers
- 2019 **Seminar**, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam, Germany
Title : Neutrinos and Nucleosynthesis in Supernovae and Mergers

CONTRIBUTED TALKS AND POSTERS

- 2022 **Contributed talk**, JINA Frontiers
Title : Heavy element nucleosynthesis and kilonovae from compact object mergers
- 2021 **Contributed talk**, Society for Industrial and Applied Mathematic (SIAM)
Title : Examining the treatment of neutrino-matter interactions in neutron star merger simulations
- 2019 **Contributed talk**, Fifty-One Ergs, North Carolina State University, Raleigh, USA
Title : Examining the treatment of neutrino-matter interactions in neutron star merger simulations
- 2018 **Poster presentation**, Nuclei in the Cosmos XV, L'Aquila, Italy
Title : PUSHing core-collapse supernovae to explosions in spherical symmetry : nucleosynthesis yields
- 2017 **Contributed talk**, Fifty-One Ergs, Oregon State University, Corvallis, USA
Title : PUSHing core-collapse supernovae to explosions in spherical symmetry : nucleosynthesis yields
- 2017 **Contributed talk**, APS April Meeting, Washington D.C., USA
Title : PUSHing core-collapse supernovae to explosions in spherical symmetry
- 2016 **Poster presentation**, Nuclei in the Cosmos (NIC) XIV, Niigata, Japan
Title : PUSHing core-collapse supernovae to explosions in spherical symmetry : nucleosynthesis yields

CONFERENCE PROCEEDINGS

- [4] C. Fröhlich, S. Curtis, K. Ebinger et al.; Nucleosynthesis in core-collapse supernovae. NIC XV Springer Proc. Phys. vol 219 pp 99-103 (2019)
- [3] C. V. Hampton, M. Lugaro, P. Papakonstantinou, P. G. Isar, B. Nordström, N. Özkan, M. Aliotta, A. Čiprijanović, S. Curtis et al.; Women scientists who made nuclear astrophysics. NIC XV Springer Proc. Phys. vol 219 pp 367-372 (2019)
- [2] S. Sinha, C. Fröhlich, K. Ebinger et al.; **PUSHing core-collapse supernovae to explosions in spherical symmetry : nucleosynthesis yields.** JPS Conf. Proc. 14, 020608 (2017)
- [1] K. Ebinger, S. Sinha, C. Fröhlich et al.; Explosion dynamics of parametrized spherically symmetric core-collapse supernova simulations. JPS Conf. Proc. 14, 020611 (2017)

LEADERSHIP, OUTREACH AND SERVICE

- 2023 **Berkeley roundtable**
Outreach to donors
- 2020 - Present **Podcasts**
Money No Get Enemy, Hanselminutes, Mindscape, Onlysky
- 2020 - Present **Science Outreach on Social Media with a Growing Audience of over 100,000 People**
*I am a prominent voice for women of color in science, with a large online platform (Twitter and Tiktok).
I use this platform for science communication and providing guidance to students interested in astro/physics.*
- 2022 - Present **Freelance Science Writing, Scientific American**
*I was invited to write a feature article on the origin of heavy elements by editors at Scientific American.
This article was published in Jan 2023 and translated into German, Italian and French. Also for SciAm, I wrote about the link between artists' pigments and elements, which featured as required reading in the art newsletter Hyperallergic.*
- 2021 - Present **Interviews and Quotes in Popular Media**
I have been interviewed by science journalists for several science and non-science articles, including pieces in the New York Times and Scientific American. I have also appeared on popular podcasts. Please see my website for details.
- 2022-Present **Postdoc Representative, IReNA**
*The committee determines the scientific directions of IReNA, optimizes funding distribution and assessing progress.
I have been working on the creation of an IReNA blog focused on academic life, DEI, and professional development.*
- 2020 - Present **Peer Reviewer**
I have reviewed several scientific papers for ApJ, ApJL and MNRAS.
- 2023 **NASA-ATP Panelist**
Part of a NASA panel reviewing proposals for the Astrophysics Theory Program.
- 2022 **Nucleosynthesis Journal Club**
I organized a virtual journal club focussed on nucleosynthesis, with participants across multiple US institutions.
- 2021 **STEM for Girls Initiative, American India Foundation**
I spoke with hundreds of middle school students in India over zoom, describing my own atypical path in astrophysics and to answer their questions about science and career options
- 2019 **AAS Media Intern**
Virtually covered the AAS Meeting for Astrobites
- 2018 - 2020 **Author, Astrobites (astrobites.org/author/scurtis/)**
Writing summaries of latest research papers for the graduate student run website.
- Summer 2019 **Machine Learning Reading Group, NC State University**
Started an unofficial reading group for physics faculty and students.
- 2017-2018 **President, Women in Physics, NC State University**
Established the official Women in Physics student organization at NC State.
- Fall 2017 **Student Mentor, College Mentors for Kids at NCSU, NC State University**
Mentored elementary school students through weekly activities on the college campus
- 2016-2017 **Vice-President, Graduate Physics Student Association, NC State University**
Served on executive board and organized several activities for fellow graduate students
- 2016-2017 **Astrophysics Open House, NC State University**
Part of organizing team for yearly events at the Reedy Creek Observatory

TRAVEL FUNDING

- 2020 **Research Visit Support, IReNA**
Awarded travel support for a visit to Dr. Evan O'Connor at Stockholm University, unused due to the COVID19 pandemic
- 2019 **Participant Support Award, MICRA 2019**
Supported by JINA-CEE and Michael Stifel Center Jena
- 2017 **All Expense Paid, 9th International HPC Summer School**
Supported by SciNet, RIKEN, XSEDE and PRACE
- 2017 **Travel Award, North American Einstein Toolkit School and Workshop at NCSA**
Supported by NSF grant 1550551 to Louisiana State University
- 2016 **Travel Award, Nuclei in the Cosmos XIV School**

SCHOOLS AND WORKSHOPS

- 2019 **Advancing Theoretical Astrophysics**, University of Amsterdam, Amsterdam, Netherlands
- 2018 **9th International High Performance Computing Summer School**, Ostrava, Czech Republic
- 2018 **FRIB TA - Neutron Star Merger Summer School**, Michigan State University, Lansing, USA
- 2017 **North American Einstein Toolkit School and Workshop at NCSA**, NCSA, Urbana, USA
- 2016 **Nuclei in the Cosmos XIV School**, Niigata University, Niigata, Japan

REFERENCES

Carla Fröhlich

University Faculty Scholar, NORTH CAROLINA STATE UNIVERSITY

@ cfrohli@ncsu.edu

Philipp Mösta

Assistant Professor, UNIVERSITY OF AMSTERDAM

@ p.moesta@uva.nl

Alexander Ji

Assistant Professor, UNIVERSITY OF CHICAGO

@ alexji@uchicago.edu