Niharika Sravan

Interests: Transients, Supernovae, Stellar Evolution Modeling, Bayesian Inference
Time-Series Analysis, Optimal Resource Allocation, Design of Experiments, Reinforcement Learning

Professional Experience

May 2021 to present	**Postdoctoral Research Associate** *California Institute of Technology,* Pasadena, CA. Prof. Matthew Graham
Oct 2018 to Apr 2021	**Postdoctoral Research Associate** *Purdue University,* West Lafayette, IN. Prof. Dan Milisavljevic

Education

2013 – 2018	**Ph.D. in Physics and Astronomy** *Northwestern University,* Evanston, IL.
Adviser	Prof. Vicky Kalogera
2011 – 2013	**M.S. in Physics and Astronomy** *Northwestern University,* Evanston, IL.
2006 – 2011	**Bachelor of Architecture (Honors) / Minor in Physics** *IIT,* Kharagpur, India.

Publications

First Author (7), .

2021	Real-time science-driven follow-up of survey transients
	BDA 2022, Lecture Notes in Computer Science, 13167
2020	Progenitors of Type IIb Supernovae: II. Observable Properties
	The Astrophysical Journal, 903, 70
2020	Real-time, Value-driven Data Augmentation in the Era of LSST
	The Astrophysical Journal, 893, 127
2019	Progenitors of Type IIb Supernovae: I. Evolutionary Pathways and Rates
	The Astrophysical Journal, 885, 130
2018	Constraints on the Progenitor System of SN 2016gkg from a Comprehensive Statistical Analysis
	The Astrophysical Journal Letters, 852, L17
2016	Strongly time-variable ultraviolet metal-line emission from the circum-galactic medium of high-redshift galaxies
	Monthly Notices of the Royal Astronomical Society, 463, 120
2014	Importance of Tides for Periastron Precession in Eccentric Neutron Star-White Dwarf Binaries
	The Astrophysical Journal, 792, 138

Significant Contribution (3).

2022	HST Proper Motion Measurements of Supernova Remnant N132D: Center of Expansion and Age
	accepted to The Astrophysical Journal
	Banovetz et al., 3rd author

2021	The Center of Expansion and Age of the Oxygen-rich Supernova Remnant 1E0102.2-7219

The Astrophysical Journal, 912, 33

Banovetz et al., 3rd author

2011	The Mass Distribution of Stellar-mass Black Holes	*The Astrophysical Journal, 741, 103*

Farr et al., 2nd author

Supported Papers (4).

2022	The prevalence and influence of circumstellar material around hydrogen-rich supernova progenitors

submitted to The Astrophysical Journal

Bruch et al., alphabetical order

2022	NMMA: A nuclear-physics and multi-messenger astrophysics framework to analyze binary neutron star mergers

submitted to Nature Astronomy

Pang et al., 12th author

2022	Inferencing Progenitor and Explosion Properties of Evolving Core-collapse Supernovae from Zwicky Transient Facility Light Curves

accepted to The Astrophysical Journal

Subrayan et al., alphabetical order

2022	The Progenitor Companion Star of the Type Ib/c SN 2013ge

The Astrophysical Journal Letters, 929, L17

Fox et al., alphabetical order

2020	Three-dimensional Kinematic Reconstruction of the Optically Emitting, High-velocity, Oxygen-rich Ejecta of Supernova Remnant N132D	*The Astrophysical Journal, 894, 73*

Law et al., 7th author

Approved Programs: PI

Feb 2021 to	DDT2021A-003: Las Cumbres Observatory - 1m/Sinistro	*30 hours*
Jul 2021	**Title:** *Autonomous Real-time Value-driven Follow-up with LCO for Next-generation Surveys.*	
Nov 2020 to	HST-AR-16154: HST Cycle 28 Theory Research (P.I.)	*Award total: $104,000*
Nov 2022	**Title:** *Optimal Use of HST for Obtaining Statistical Constraints for SN IIb Progenitors and their Companions.*	

Invited Talks

Nov 2, 2022	Astrophysics seminar	*University of Pennsylvania, PA*
	Title: *Autonomous Real-time Decision-making in the Era of Multi-messenger Astronomy.*	
Feb 24, 2022	Physics Colloquium	*Drexel University, PA*
	Title: *Autonomous Real-time Decision-making in the Era of Multi-messenger Astronomy.*	
Dec 7, 2021	Big Data Analytics in Science and Engineering	*Virtual*
	Title: *Autonomous real-time science-driven follow-up in the era of LSST.*	
Jun 29, 2021	Machine Learning and Visualisation in Data Intensive Era: EAS Annual Meeting	*Virtual*
	Title: *Autonomous real-time science-driven follow-up in the era of LSST.*	
Sep 4, 2020	Rosen Center for Advanced Computing Friday Seminar	*Purdue University, IN*
	Title: *Autonomous real-time value-driven data augmentation in the era of big-data astronomy.*	

Oct 31, 2019	ITC Luncheon	*Center for Astrophysics, MA*
	Title: *Real-time Value-Driven Data Augmentation in the era of LSST.*	
Oct 30, 2019	High Energy Phenomena Seminar	*Center for Astrophysics, MA*
	Title: *Observational parameter space for SN IIb progenitors from population-scale stellar evolution modeling.*	
May 26, 2017	KICP Friday Seminar	*University of Chicago, IL*
	Title: *Single and binary progenitors of Type IIb supernovae.*	

Fellowships

Jul 2016 to Jun 2017	IDEAS Data-Science Fellow ideas.ciera.northwestern.edu	*Northwestern University, IL*
Jun 2015 to Jun 2016	Reach for the Stars GK-12 Fellow gk12.ciera.northwestern.edu	*Northwestern University, IL*

Mentoring

Graduate Students.

Oct 2021 to present	Shreya Anand **Project:** Identification of kilonovae for ZTFReST and LIGO O4	*Caltech, CA*
Sep 2019 to Apr 2021	Bhagya Subrayan **Project:** Constraining explosion physics from sparse survey supernova light curves using MCMC, HMC, and Dynamic Nested Sampling	*Purdue University, IN*
Oct 2018 to Apr 2021	John Banovetz **Project:** Estimating center of expansion and age of supernova remnants by tracking ejecta in multi-epoch HST imaging	*Purdue University, IN*
Nov 2015 to Dec 2016	Aprajita Hajela **Project:** Analytical modeling of binary orbital evolution with supernova kicks	*Northwestern University, IL*

Postbaccalaureate Students.

Nov 2022 to present	Abigail Gray **Project:** Training dataset for gravitational and electromagentic wave signals from compact binary coalescenecest	*University of Minnesota, MN*

Undergraduate Students.

Jun 2022 to Aug 2022	Riti Agarwal	*Caltech, CA*
Jun 2019 to Sep 2020	Jack Reynolds	*Purdue University, IN*
Mar 2018 to May 2021	Carleen Markey	*Purdue University, IN*
Jun 2015 to Jun 2017	Chase Kimball	*Northwestern University, IL*

Jan 2015 to Jun 2017	Slobodan Mentovic	*Northwestern University, IL*

Teaching

Zwicky Transient Facility Summer School, *Virtual.*

2021, 2022	Introduction to Machine Learning

Guest Lectures, *Purdue University.*

Spring 2021	Stars And Galaxies (ASTR 36400)
Fall 2020	Data Mine Astronomy (PHYS 39000)
Fall 2019	Cosmology (ASTR 370)

Teaching Assistant, *Northwestern University.*

Spring 2015	General Physics Laboratory - Introduction to Modern Physics (PHYSICS 136-3)
Winter 2015	Solar System (ASTRON 103-0)
Spring 2014	General Physics - Mechanics (PHYSICS 135-1)
Winter 2013, 2014	General Physics - Electricity and Magnetism (PHYSICS 135-2)
Spring 2013	General Physics - Introduction to Modern Physics (PHYSICS 135-3)
Fall 2012	College Physics Laboratory - Mechanics (PHYSICS 130-1)

MESA Tutorials, *Northwestern University.*

4 Quarters, 2014 to 2016	Stellar Astrophysics (ASTRON 325-0/425-0)

AY 2015 – 2016	**GK-12,** *Evanston Township High School.* Advanced Astrophysics	

Leadership

May 2022 to present	Lead, Zwicky Transient Facility Machine Learning Working Group	
Jun 2016 to Sep 2018	Organizer, Northwestern Machine Learning Meetup http://www.meetup.com/NU-Machine-Learning-Meetup/	
Nov 2015 to Nov 2016	Chair, Committee on Diversity and Inclusion Physics & Astronomy Graduate Student Council	*Northwestern University, IL*
Nov 2015 to Jun 2016	Peer Inclusion Educator Social Justice Education, Division of Student Affairs	*Northwestern University, IL*

Service and Outreach (selected)

2017 to Present	Referee for Nature, ApJ, MNRAS	
Jan 4 – 8, 2016	Crash Course in Computational Astrophysics (Winter School)	*Hill Top School, Jamshedpur, India*

Sep 22, 2015	WiSTEM Guest Speaker	*Prospect High School, Mt. Prospect, IL*
Jan – Dec, 2015	Presenter for Einstein Evenings	*Dearborn Observatory, IL*
Nov 15, 2014	FUSE Workshop at Girls Do Hack	*The Adler Planetarium, Chicago, IL*
Jul 17, 2014	Star Art with 3-5 year olds at Camp Kaleidoscope: Planets, Space and Sky	*Chandler-Newberger Community Center, Evanston, IL*