
ASMITA BHANDARE

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🔍 RESEARCH INTERESTS

Formation and evolution of stars, circumstellar disks, and planets

🔍 POSITIONS

- Postdoctoral researcher
Universitäts-Sternwarte München (USM, LMU), Munich, Germany November 2023 - present
Advisor: Prof. Dr. Til Birnstiel
- Postdoctoral researcher
Centre de Recherche Astrophysique de Lyon (CRAL), Lyon, France 2020 - 2023
Advisors: Dr. Benoît Commerçon and Prof. Dr. Guillaume Laibe

🎓 EDUCATION

- **Ph.D. in Astronomy**
Max Planck Institute for Astronomy (MPIA), Heidelberg, Germany 2016 - 2020
Ph.D. Thesis: Numerical simulations of star and disk formation
Advisors: Prof. Dr. Thomas Henning (MPIA), Prof. Dr. Rolf Kuiper (University of Tübingen), Dr. Christian Fendt (MPIA)
- **Master of Science in Astrophysics**
Argelander Institute for Astronomy (AIfA), University of Bonn, Germany 2013 - 2015
Master Thesis: Investigation of the effects of stellar encounters on protoplanetary disk size
Advisor: Prof. Dr. Susanne Pfalzner (Max Planck Institute for Radio Astronomy)
- **Master of Science in Physics** (*discontinued the 2-year program to move to Bonn, Germany*)
Fergusson College, University of Pune, India 2012 - 2013
Summer internship in 2013: X-ray emission from the Active Galactic Nuclei: H1821+643
Advisor: Prof. Dr. Gulab Chand Dewangan (Inter-University Centre for Astronomy and Astrophysics)
- **Bachelor of Science in Physics**
Fergusson College, University of Pune, India 2009 - 2012
Bachelor Thesis: Exoplanet Transit Studies of WASP-12 b and HAT-P-7 b
Advisor: Dr. Firoza Sutaria (Indian Institute of Astrophysics, Bangalore, India)

📁 EXPERTISE

- Numerical tools: Radiation magneto-hydrodynamics grid codes (PLUTO, RAMSES), N-body codes
- Programming: Python, C, C++, HTML, Markdown
- Softwares and Tools: \LaTeX , Git, Jupyter Notebook/Lab, Atom, Vim, VS Code, PyCharm, MS Office
- Operating Systems: macOS, Linux, Windows
- Languages: English (fluent), Marathi (native), Hindi (native), German (B1)

🏛️ TEACHING EXPERIENCE

[SS = Summer Semester; WS = Winter Semester]

- Tutor for the Advanced Laboratory Course on “CCD photometry in modern astronomy” SS 2018
- Tutor for the Advanced Laboratory Course on “Photometry of Star Clusters” SS 2014, WS 2015
- Tutor for the course on “The physics of dense stellar systems” by Prof. Pavel Kroupa SS 2014

★ OBSERVING EXPERIENCE

- Exoplanet transit observations using:
 - 1.23 m telescope, Calar Alto Observatory, Spain (for Project EDEN) 10 nights
 - MPG / ESO 2.2m, La Silla, Chile 5 nights
 - 2m Himalayan Chandra Telescope, Indian Astronomical Observatory, Hanle, Ladakh 2 nights
- Successfully got over 10 follow-up observations of known near-Earth objects allowing further refinements to their orbit calculations during the All India Asteroid Search Campaign (AIASC) as part of the International Asteroid Search Campaign in 2010
- Contributed to the International Meteor Organization (Visual Meteor shower observations), under an Indian Space Research Organization (ISRO) project from 2010 to 2012

📄 PUBLICATIONS

Lead author:

- **Bhandare A.**, Commerçon B., Laibe G., Flock M., Kuiper R., Henning Th., Mignone A., and Marleau G-D., “*Mixing is easy: New insights for cosmochemical evolution from pre-stellar core collapse*”, 2024, A&A, 687, A158
- **Bhandare A.**, Kuiper R., Henning Th., Fendt C., Flock M., and Marleau G-D., “*Birth of convective low-mass to high-mass second Larson cores*”, 2020, A&A, 638, A86
- **Bhandare A.** and Pfalzner S., “*DESTINY: Database for the effects of stellar encounters on disks and planetary systems*”, 2019, Computational Astrophysics and Cosmology, 6: 3
- **Bhandare A.**, Kuiper R., Henning Th., Fendt C., Marleau G-D., and Kölligan A., “*First core properties: From low- to high-mass star formation*”, 2018, A&A, 618, A95
- **Bhandare A.**, Breslau A., and Pfalzner S., “*Effects of inclined star-disk encounter on protoplanetary disk size*”, 2016, A&A, 594, A53

Co-author:

- The Treilles group (including **Bhandare A.**), “*Formation and evolution of a protoplanetary disk: combining observations, simulations, and cosmochemical constraints*”, 2024, A&A, 691, A147
Contribution: Overview of low-mass star & disk formation and dust transport via outflows.
- Leclerc A., Jezequel L., Perez N., **Bhandare A.**, Laibe G., and Delplace P., “*The Exceptional Ring of buoyancy instability in stars*”, 2023, Physical Review Research, L012055
Contribution: Provided data for convective low-mass protostars presented in Bhandare et al. (2020).
- Lin CL. et al. (including **Bhandare A.**), “*EDEN: Flare Activity of the Nearby Exoplanet-hosting M Dwarf Wolf 359 Based on K2 and EDEN Light Curves*”, 2021, The Astronomical Journal, 162, 11
Contribution: Performed observations using the 1.23 m telescope at the Calar Alto Observatory in Spain.
- Pfalzner S., Aizpuru Vargas L., **Bhandare A.**, and Veras D., “*Significant interstellar object production by close stellar flybys*”, 2021, A&A, 651, A38
Contribution: Helped with the simulation setup, based on methods presented in Bhandare et al. (2016), for star-disk encounter studies with applications to interstellar objects.
- Rosen A. L., Offner S. S. R., Sadavoy S. I., **Bhandare A.**, Vázquez-Semadeni E., and Ginsburg A., “*Zooming in on Individual Star Formation: Low- and High-mass Stars*”, 2020, Space Science Reviews, 216, 62
Contribution: Overview of numerical studies on low-mass star formation.
- Zhao B. et al. (including **Bhandare A.**), “*Formation and Evolution of Disks Around Young Stellar Objects*”, 2020, Space Science Reviews, 216, 43
Contribution: Overview of numerical studies on disk formation around low-mass stars.

- Gibbs A. et al. (including **Bhandare A.**), “EDEN: Sensitivity Analysis and Transiting Planet Detection Limits for Nearby Late Red Dwarfs”, 2020, The Astronomical Journal, 159, 169
Contribution: Performed observations using the 1.23 m telescope at the Calar Alto Observatory in Spain.
- The ‘Oumuamua ISSI team, “Natural History of ‘Oumuamua”, 2019, Nature Astronomy, 3, 594-602
Contribution: Invited “Young scientist” for a workshop on the interstellar object 1I/‘Oumuamua at ISSI, Bern to provide expertise on ejection probabilities of interstellar objects due to the effects of stellar encounters.
- Pfalzner S., **Bhandare A.**, Vincke K., and Lacerda P., “Outer solar system possibly shaped by a stellar fly-by”, 2018, ApJ, 863, 45
Contribution: Data used from the star-disk encounter studies presented in Bhandare et al. (2016) for applications to objects in the outer Solar system.
- Pfalzner S., **Bhandare A.**, and Vincke K., “Did a stellar fly-by shape the planetary system around Pr 0211 in the cluster M 44?”, 2017, A&A, 610, A33
Contribution: Data used from the star-disk encounter studies presented in Bhandare et al. (2016) to analyse the role of stellar encounter(s) in shaping planetary orbits.
- Pfalzner S. et al. (including **Bhandare A.**), “Observational constraints on star cluster formation theory. I. The mass-radius relation”, 2016, A&A, 586, A68
Contribution: Provided estimates for the mass-radius relation for various star clusters.

🏆 ACHIEVEMENTS AND AWARDS

- Best poster prize at “The Early Phase of Star formation: Archetypes”, Ringberg Castle, Germany 2018
- Honourable mention for the poster at “Star formation from cores to clusters”, Santiago, Chile 2017
- First prize for a lecture competition organized by the Indian Physics Association 2013
- Second best poster prize at the “17th National Space Science Symposium”, Tirupati, India 2012

👤 ORGANIZATIONAL RESPONSIBILITIES

- USM Postdoc Representative 2025 - 2026
- ORIGINS Cluster Postdoc Representative 2024 - 2025
- Member of the LOC for “The Physics of Star Formation: From Stellar Cores to Galactic Scales” (Star@Lyon), Lyon, France 2023
- Weekly journal club co-organizer at the CRAL 2021 - 2023
- Volunteered as a session host at the European Astronomical Society (EAS) Annual Meeting 2021
- Member of the LOC for “The Early Phase of Star formation (EPoS) 2020: Insights from Dynamics”, Ringberg Castle, Germany - Cancelled due to COVID-19 2020
- MPIA Student Representative 2017 - 2019
- IMPRS Student Representative 2016 - 2019
- Member of the LOC & SOC for the Heidelberg-Harvard workshop: The physics of star formation 2018
- Editorial Board Member for the monthly newsletter *Dimensions* published by the Astro Club at the Department of Physics, Fergusson College, Pune, India 2010 - 2012
- Member of the LOC for “Frontiers in Physics” - a yearly seminar at Fergusson College 2009 - 2013

⇒ EDUCATION AND PUBLIC OUTREACH

- Engaged in education and science outreach activities as an Associate Scientist at the IAU Office of Astronomy for Education in Heidelberg, Germany 2021 - present
- Volunteered as a mentor for the Supernova Foundation 2021 - present
- Volunteered as a pen-pal for the “Letters to a Pre-Scientist” program 2019 - present
- Member of the SOC & LOC for the 3rd and 4th Shaw-IAU workshop on Astronomy for Education 2021 - 2022
- Member of the LOC for the IAU Offices Family Meeting 2021
- Organized the Max Planck Day Science Slam 2018
- Organized and volunteered for several public outreach programs in India 2007 - 2013

🗂️ TALKS AND POSTER PRESENTATIONS

- MPS Seminar April 2025
Invited Talk: “Simulation-Based Insights on Early Stages of Star & Disk Formation”
 @ Max Planck Institute for Solar System Research, Göttingen, Germany
- StarPlan Seminar November 2024
Invited Talk: “Simulation-Based Insights on Early Stages of Star & Disk Formation”
 @ University of Copenhagen, Denmark
- MPE-CAS Seminar June 2024
Invited Talk: “Simulation-Based Insights into Dynamics within Young Protostellar Disks”
 @ Max Planck Institute for Extraterrestrial Physics, Garching, Germany
- The Early Phase of Star formation: Answering the Big Questions – Are we making progress? May 2024
 Poster: “Unravelling the effects of gas and dust dynamics during protostellar collapse”
 @ Ringberg Castle, Germany
- SPiCE workshop March 2024
Invited Talk: “Mixing is easy: new insights on gas-dust dynamics during star and disk formation”
 @ Tohoku University, Sendai, Japan
- PROMETHEE workshop III November 2023
 Contributed Talk: “Gas and dust dynamics during protostellar collapse”
 @ (Virtual) CRAL, Lyon, France
- The formation of protoplanetary disks (DISKBUILD Meeting IV) November 2023
Invited Talk: “Mixing is easy: new insights from pre-stellar core collapse for cosmochemical evolution”
 @ Treilles, France
- Magnetohydrodynamical flows in young circumstellar disks October 2023
 Poster: “Unravelling the effects of gas and dust dynamics during protostellar collapse”
 @ Ringberg Castle, Germany
- The Physics of Star Formation: From Stellar Cores to Galactic Scales (Star@Lyon) June 2023
 Poster: “Unravelling the effects of gas and dust dynamics during protostellar collapse”
 @ Université Claude Bernard Lyon, France
- DISKBUILD Meeting III May 2023
 Contributed Talk: “Resolving dust pockets in young protostellar disks”
 @ Centre de Recherches Pétrographiques et Géochimiques, Nancy, France
- Protostars and Planets VII April 2023
 Poster: “Unravelling the effects of gas and dust dynamics during protostellar collapse”
 @ Kyoto International Conference Center, Japan
- Computational Astrophysics Seminar January 2023
Invited Talk: “Unravelling the birth of stars and protostellar disks”
 @ (Virtual) University of Duisburg-Essen, Germany

- PROMETHEE workshop II
Contributed Talk: “Unravelling the birth of stars and protostellar disks”
@ Institute for Planetary sciences and Astrophysics of Grenoble, France

November 2022
- CRAL Internal Seminar
Invited Talk: “Unravelling the birth of stars and protostellar disks”
@ CRAL, Lyon, France

September 2022
- Planet and binary formation in gravitationally unstable protoplanetary disks in the high-resolution era
Contributed Talk: “The interplay of gas and dust dynamics during star and disk formation”
@ (*Virtual*) College Court Conference Centre, Leicester, UK

September 2022
- University Observatory Munich Colloquium
Invited Talk: “Unravelling the birth of stars and protostellar disks”
@ USM, Munich, Germany

July 2022
- MPE-CAS Journal Club
Invited Talk: “Unravelling the birth of stars and protostellar disks”
@ Max Planck Institute for Extraterrestrial Physics, Garching, Germany

July 2022
- 24th Meeting on Research in Astronomy
Invited Talk: “Zooming in on star and disk formation”
@ (*Virtual*) IASBS, Zanzan, Iran

June 2022
- DISKBUILD Meeting I
Contributed Talk: “The interplay of gas and dust dynamics during star and disk formation”
@ (*Virtual*) Institut de Physique du Globe de Paris, France

May 2022
- The Early Phase of Star formation: Insights from Dynamics
Poster: “The interplay of gas and dust dynamics during star and disk formation”
@ Ringberg Castle, Germany

April 2022
- PROMETHEE workshop I
Contributed Talk: “Birth of convective protostars”
@ (*Virtual*) Institute for Planetary sciences and Astrophysics of Grenoble, France

November 2021
- Königstuhl Colloquium
Invited Talk: “Zooming in on star and disk formation”
@ MPIA, Heidelberg, Germany

October 2020
- (*Virtual*) Annual Meeting of the German Astronomical Society
Contributed Talk: “Zooming in on star and disk formation”

September 2020
- Astro-colloquium
Invited Talk: “Zooming in on star and disk formation”
@ Institute for Astronomy and Astrophysics, Tübingen, Germany

January 2020
- Stars, Planets, & ISM seminar
Invited Talk: “Zooming in on the early stages of star and disk formation”
@ Department of Astronomy, UT Austin, USA

November 2019
- Stars & Planets seminar
Invited Talk: “Zooming in on the early stages of star and disk formation”
@ CfA, Cambridge, MA, USA

November 2019
- Harvard-Heidelberg Star Formation workshop: Linking Observations & Simulations
Poster: “Early stages of star and disk formation”
@ CfA, Cambridge, MA, USA

November 2019
- Fachbeirat 2019
Talk: “Zooming in on the early stages of star and disk formation”
@ MPIA, Heidelberg, Germany

November 2019
- ITA blackboard colloquium
Invited Talk: “Early stages of star and disk formation”
@ ITA, Heidelberg, Germany

July 2019

- Zooming in on Star Formation June 2019
Poster: "Early stages of star and disk formation"
@ Vouleftikon, Nafplio, Greece
- Star formation workshop May 2019
Contributed Talk: "Earliest stages of star and disk formation"
@ International Space Science Institute (ISSI), Bern, Switzerland
- Heidelberg-Harvard workshop: The physics of star formation – Gas flows from Milky Way cloud scales to protostellar disks December 2018
Contributed Talk: "From molecular cores to hydrostatic cores"
@ MPA, Heidelberg, Germany
- CRAL Internal Seminar November 2018
Invited Talk: "From molecular cores to hydrostatic cores"
@ CRAL, Lyon, France
- The Wonders of Star Formation September 2018
Poster: "Early stages of low- to high-mass star formation"
@ John McIntyre Conference Centre, Edinburgh, Scotland
- The Olympian Symposium May 2018
Poster: "First core properties: from low- to high-mass star formation"
@ Paralía Katerini, Mount Olympus, Greece
- The Early Phase of Star formation (EPoS): Archetypes May 2018
Poster and **(poster-prize) Talk**: "From molecular cloud cores to hydrostatic cores"
@ Ringberg Castle, Germany
- PSF coffee April 2018
Invited Talk: "From clouds to cores"
@ MPA, Heidelberg, Germany
- SP2: Star and Planet Formation in the Southwest March 2018
Poster: "First core lifetime from low-mass to high-mass star formation"
@ Biosphere 2 Center Oracle, Arizona, USA
- ISM day February 2018
Contributed Talk: "First core lifetime from low-mass to high-mass star formation"
@ Hamburg Observatory, Germany
- Star formation from cores to clusters March 2017
Poster: "Numerical simulations of low-mass star formation"
@ ESO, Santiago, Chile
- PSF coffee September 2016
Invited Talk: "Effects of inclined star-disk encounter on protoplanetary disk size"
@ MPA, Heidelberg, Germany
- DGG (Deutschen Geophysikalischen Gesellschaft) conference March 2016
Poster: "Effects of star-disk encounters on protoplanetary disks"
@ Natural Science Centre of the University of Münster, Germany
- The Formation of the Solar System II June 2015
Poster: "Effects of star-disk encounters on protoplanetary disks"
@ Harnack House, Berlin, Germany
- National Student Symposium on Physics February 2013
Poster: "Study of Transiting Exoplanets WASP-12 b and HAT-P-7 b"
@ Panjab University, Chandigarh, India
- The 17th National Space Science Symposium February 2012
Poster: "Study of Transiting Exoplanet - WASP-12 b"
@ Sri Venkateswara University, Tirupati, India

OTHER CONFERENCES, WORKSHOPS AND SUMMER SCHOOLS

- PLUTO symposium
@ (*Virtual*) Torino University, Italy
 - Dustbusters workshop: New Heights in Planet Formation
@ ESO, Garching, Germany
 - Formation of the Protosolar Disk and of Its Planetesimals
@ Collège de France, Paris, France
 - DISKBUILD Meeting II
@ CRAL, Lyon, France
 - Gaps, Rings, Spirals, and Vortices: Structure formation in planet-forming disks
@ Munich Institute for Astro and Particle Physics (MIAPP), Munich, Germany
 - European Astronomical Society (EAS) Annual Meeting
@ (*Virtual*) Leiden Observatory, The Netherlands
 - PLUTO symposium
@ (*Virtual*) Torino University, Italy
 - From prestellar cores to solar nebulae II
@ (*Virtual*) Institute Pascal, Paris, France
 - Invited Young scientist for a workshop on the interstellar object 1I/'Oumuamua
@ International Space Science Institute (ISSI), Bern, Switzerland
 - NBIA summer school: Astrophysical plasmas - from planets to galaxies
@ Niels Bohr Institute, Copenhagen, Denmark
 - Heidelberg-Harvard workshop: Physics of star formation – Milky Way and Beyond
@ MPA, Heidelberg, Germany
 - Exoplanets in Lund 2015
@ Lund Observatory, Sweden
 - The Formation of the Solar System
@ Max Planck Institute for Radio Astronomy, Bonn, Germany
 - Vacation Students Programme
@ Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India
 - Summer School organized by the Indian Institute of Astrophysics
@ Kodaikanal Observatory, India
 - 12th PLANEX workshop: Exploration of Asteroids and Comets
@ Mt. Abu, Rajasthan, India
 - Summer Internship Programme
@ Indian Institute of Astrophysics, Bangalore, India
 - Frontiers in Physics - a yearly seminar series
@ Fergusson College, Pune, India

- September 2024
 - July 2024
 - June 2024
 - December 2022
 - October 2021
 - June-July 2021
 - June 2021
 - May 2021
 - November 2018
 - August 2017
 - November 2016
 - May 2015
 - May 2014
 - Summer 2013
 - Summer 2012
 - January 2012
 - Summers 2011 and 2012
 - 2009 - 2013