

Dr. Rajika Kuruwita**Citizenship: Australian**

CONTACT INFORMATION	Heidelberg Institute for Theoretical Studies Schloß-Wolfsbrunnenweg 35 69118 Heidelberg, Germany	Tel: +49 176 2675 1570 E-mail: rajika.kuruwita@h-its.org Website: https://rajikalk.github.io/index.html ORCID: 0000-0002-9236-2919
RESEARCH INTERESTS	Star formation, binary and multiple star systems, protoplanetary disks and planets in binary star systems, MHD simulations, software development.	
EDUCATION	Australian National University , Canberra, Australia	February, 2015 - January, 2019
	PhD <ul style="list-style-type: none">• Thesis Topic: "The formation, evolution, and survivability of discs around young binary stars"• Primary Supervisor: Associate Professor Christoph Federrath• Secondary Supervisor: Professor Michael Ireland	
	Macquarie University , Sydney, Australia	February, 2010 - January, 2015
	MRes. Physics and Astronomy <ul style="list-style-type: none">• Thesis Topic: "Fallback disks and the end of the common envelope phase"• Primary Supervisor: Professor Orsola De Marco• Secondary Supervisor: Assistant Professor Jan Staff	
	BSc. Astronomy and Astrophysics	
EMPLOYMENT HISTORY	Heidelberg Institute for Theoretical Studies , Heidelberg, Germany	
	<i>Independent Postdoc Fellow</i>	October, 2019 - Present
	Research the formation of binary and multiple star systems via numerical simulations.	
	University of Copenhagen , Copenhagen, Denmark	
	<i>Post-doctorate researcher (Marie Skłodowska-Curie Interactions Fellow)</i>	April, 2019 - August, 2022
	Investigate protostellar multiplicity and binarity on disk evolution.	
	Australian National University , Canberra, Australia	
	<i>Research Assistant</i>	February, 2019 - April, 2019
	Research the formation of binary stars systems via simulations.	
	<i>Outreach Assistant</i>	December, 2015 - April, 2019
	Organise and run outreach observing and site tours for the public, school, scout, and private groups, as well as design activities for the observatory visitor centre.	
	Macquarie University , Sydney, Australia	
	<i>Laboratory Demonstrator</i>	February, 2014 - January, 2015
	Taught lab experiments for undergraduate students. This also involved marking lab books.	
	<i>Observatory and Planetarium Supervisor</i>	February, 2010 - January, 2015
	Coordinated groups, created tours and presentations, operated observatory and planetarium.	
	<i>Vacation Scholarship Researcher</i>	December, 2012 - February, 2013
	Simulated light curves to understand the influence of exoplanets on the asteroseismological pulsation spectrum of stars.	
	<i>Vacation Scholarship Researcher</i>	January, 2012 - February, 2012
	Carried out research on nanowires using white light interferometry.	
TIME AWARDED	Australian National University 2.3m Telescope <ul style="list-style-type: none">• PI: Building a Census of Protoplanetary Disks in Binary Star Systems (20 nights over 3 years)	

LUMI Supercomputer

- CO-I: Embedded Disks: 24000000 core hours over 12 months

PRACE

- CO-I: Embedded Disks (2021250113): 40000000 core hours over 12 months

SELECTED TALKS	Anton Pannekoek Institute for Astronomy	April, 2022
	Invited Talk	Amsterdam, The Netherlands
	Distorted Astrophysical Discs	May, 2021
	Contributed Talk	Cambridge, UK
	Niels Bohr Institute	January, 2019
	Invited Talk	Copenhagen, Denmark
	Sutherland Astronomical Society Incorporated	September, 2018
	Invited Talk	Sydney, Australia
	Franco-Australian Astrobiology and Exoplanet School and Workshop	December, 2017
	Contributed Talk	Canberra, Australia
AWARDS AND HONORS	Mt Stromlo Students Seminars	December, 2016
	Contributed Talk (Awarded Best Theme Talk)	Canberra, Australia
	Star Formation	August, 2016
	Computational Astrophysics splinter session (Invited)	Exeter, UK
	• 2023: Hochschulwettbewerb (national college competition) winners. Received 10000EUR to create a communication project about 'Our Universe'.	
	• 2021: Kvinder i Fysik (Danish Women in Physics) Prize 2021 Nominee	
	• 2020: European Union INTERACTIONS Fellowship	
	• 2017: Joan Duffield Research Supplementary Scholarship	
	• 2015: Australian Postgraduate Award	
	• 2013: Macquarie University Research Training Scholarship	
• 2012: Vacation Scholarship (Macquarie University)		
• 2011: Vacation Scholarship (Macquarie University)		
TEACHING	Computational astrophysics lecturing	November, 2019 - 2020
	Gave post-graduate level lectures on computational astrophysics reviewing hydrodynamics and modelling shock waves.	
	Laboratory demonstrator	February, 2014 - January, 2015
	Taught lab experiments for undergraduate students in physics and astronomy. I also marked lab books.	
SUPERVISION	Niels Bohr Institute masters students	August, 2021 - Present
	I co-supervised three masters students that worked on producing synthetic observations from my simulations and built a pipeline using machine learning to fit synthetic observations to real observations of young protostars.	
	Niels Bohr Institute bachelors projects	February-April, 2021, 2022
	Supervised 5 bachelor student groups on projects including modelling exoplanet interiors, and n-body simulations of the solar system and stellar systems.	
	Mt Stromlo Observatory summer research	December, 2017 - February, 2018
	Co-supervised honours student Isabella Gerard on a research project on turbulent magnetic fields and star formation. I am co-author on the paper published from this project.	
Mt Stromlo Observatory winter school	June-July, 2017	
Advised undergraduate students Lara Cullinane, Patrick Armstrong, Joshua Ho and Lillian Guo in planning observations and writing telescope proposals.		
COMPUTER SKILLS	<ul style="list-style-type: none">• Computing Languages: Python, Fortran and html• Applications: L^AT_EX, yt, simulation codes RAMSES, FLASH, DISPATCH and Enzo, analysis of hdf5 files from hydrodynamic simulations, reducing observational data in fits files, retrieving radial velocities.• Operating Systems: Unix/Linux, Windows, and Mac.	

- OTHER ACADEMIC SERVICES
- Reviewer for Monthly Notices of the Royal Astronomical Society
 - Founded of Astronomy on Tap Copenhagen in 2020.
 - Treasurer of Kvinder i Fysik (the Danish women in physics society) from 2019 to present.
 - Contributed two popular science articles to the Sunday Space in the Canberra Times.
 - Member of the Local Organising Committee for the 2017 Harley Wood Winter School and Annual Scientific Meeting of the Astronomical Society of Australia.
 - Member of the Science Organising Committee for the 2016 Harley Wood Winter School.
 - Chair of the Organising Committee for the 2016 Mt Stromlo Student Seminars.
- REFeree DETAILS
- Associate Professor Troels Haugbølle, Center for Star and Planet Formation, University of Copenhagen, Geology Museum, Øster Voldgade 5-7, 1350 København K, Denmark. Tel: +45 35 32 11 41. Email: haugboel@nbi.ku.dk
 - Associate Professor Christoph Federrath, Research School of Astronomy and Astrophysics, Australian National University, Research School of Astronomy & Astrophysics, Mount Stromlo Observatory, Cotter Road, Weston Creek, ACT 2611, AUstralia. Tel: +61 2 6125 0217. Email: christoph.federrath@anu.edu.au
 - Professor Jes Kristian Jørgensen, Center for Star and Planet Formation, University of Copenhagen, Geology Museum, Øster Voldgade 5-7, 1350 København K, Denmark. Tel: +45 35 32 41 86. Email: jeskj@nbi.ku.dk
 - Dr. Fabian Schneider, Heidelberg Institute for Theoretical Studies, Schloss-Wolfsbrunnenweg 35, 69118 Heidelberg, Germany. Tel: +49 6221 533 334. Email: fabian.schneider@h-its.org
- REFereed PUBLICATIONS
- Kuruwita & Haugbølle**, *The contribution of core-fragmentation on protostellar multiplicity*, 2023, *Astronomy & Astrophysics*, 674, A196
- Lead author, and conductor of research and analysis.
- Kuruwita et al.**, *The dependence of episodic accretion on eccentricity during the formation of binary stars*, 2020, *Astronomy & Astrophysics*, 641, A59
- Lead author, and conductor of research and analysis.
- Kuruwita & Federrath**, *The role of turbulence during the formation of circumbinary disks*, 2019, *Monthly Notices of the Royal Astronomical Society*, 486, 3647-3663
- Lead author, and conductor of research and analysis.
- Kuruwita et al.**, *Multiplicity of disc-bearing stars in Upper Scorpius and Upper Centaurus-Lupus*, 2018, *Monthly Notices of the Royal Astronomical Society*, 480, 5099–5112
- Lead author, and conductor of research and analysis.
 - Collected the majority of observations.
- Kuruwita et al.**, *Binary star formation and the outflows from their discs*, 2017, *Monthly Notices of the Royal Astronomical Society*, 470, 1626-1641
- Lead author, and conductor of research and analysis.
- Kuruwita et al.**, *Considerations on the role of fall-back discs in the final stages of the common envelope binary interaction*, 2016, *Monthly Notices of the Royal Astronomical Society*, 461, 486-496
- Lead author, and conductor of research and analysis.
- Vito Tuhtan, Rami Al-Belmeisi, Mikkel Bregning Christensen, **Rajika Kuruwita**, & Troels Haugbølle, *Simulated Analogues I: apparent and physical evolution of young binary protostellar systems*, 2023, *Submitted to MNRAS*
- Co-supervised Vito, Rami, and Mikkel for their Master's thesis
- Rami Al-Belmeisi, Vito Tuhtan, Mikkel Bregning Christensen, **Rajika Kuruwita**, & Troels

Haugbølle, *Simulated analogues II: a new methodology for non-parametric matching of models to observations*, 2023, *In review at MNRAS*

- Co-supervised Vito, Rami, and Mikkel for their Master's thesis

Jørgensen, J. & **Kuruwita, R.** et al, *Binarity of a protostar affects the evolution of the disk and planets*, 2021, *Nature*, Volume 606, Issue 7913, p.272-275

- Lead the theoretical component of paper. Conducted analysis of simulations used for comparison with observations.

Gerrard, I., Federrath, C., & **Kuruwita, R.**, *The role of magnetic field structure in the launching of protostellar jets*, 2019, *Monthly Notices of the Royal Astronomical Society*, 485, 5532-5542

- Co-supervised Gerrard in running simulations and analysing them

Green et al., *Testing the binary trigger hypothesis in FUors*, 2016, *The Astrophysical Journal*, 830, 29

- Obtained observational data with Keck and contributed to paper writing.

Childress et al., *The ANU WiFeS SuperNova Programme (AWSNAP)*, 2016, *Publications of the Astronomical Society of Australia*, 33, 29

- Obtained observational data with Australian National University 2.3m telescope.

Little et al., *Phase-stepping interferometry of GaAs nanowires: Determining nano-wire radius*, 2013, *Applied Physical Letters*, 103, 161107

- Obtained experimental data with white light interferometry of nanowires.