

EMPLOYMENT

Oort Fellow and IAU TGF Fellow Leiden University	Oct. 2022 – Leiden, Netherlands
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EDUCATION & RESEARCH EXPERIENCE

Doctor of Philosophy <i>Astronomy & Astrophysics</i> Australian National University (ANU) <i>Title: The role of metals from molecular clouds to galactic discs</i> <i>Advisor: Mark Krumholz</i>	Oct. 2018 – Mar 2022 Canberra, Australia
Master of Science (Hons.) <i>Physics</i> [Distinction] Birla Institute of Technology & Science (BITS)	Aug. 2013 – Jun 2018 Pilani, India
Postgraduate Research Student <i>Astronomy</i> University of Exeter (joint with BITS)	Jan. 2018 – Jun 2018 Exeter, UK
Undergraduate Research Student <i>Astronomy</i> Australian National University (joint with BITS) (publication)	Sep. 2017 – Dec 2017 Canberra, Australia
BITS Alumni Association Summer Scholar <i>Astronomy</i> Harvard-Smithsonian Centre for Astrophysics (publication)	May. 2017 – Aug 2017 Cambridge, USA
Indian Dept. of Science & Technology Summer Scholar <i>Planetary Science</i> Physical Research Laboratory (publication)	May. 2016 – Aug 2016 Ahmedabad, India
Bachelor of Engineering (Hons.) <i>Electrical & Electronics</i> [Distinction] Birla Institute of Technology & Science (BITS)	Aug. 2013 – Jun 2018 Pilani, India

HONORS & AWARDS

Charlene Heisler Prize for outstanding PhD in astronomy in Australia (A\$1000)	Jun 2023
International Astronomical Union (IAU) Division H PhD Prize	Jun 2023
IAU – Gruber Foundation TGF Fellowship (\$25000)	May 2022
Australian Academy of Science SIEF Fellowship (A\$9000)	Apr 2022
Oort Fellowship (Leiden University)	Jan 2022
Schwarzschild Fellowship (Leibniz-Institute for Astrophysics, <i>declined</i>)	Jan 2022
Max Planck Postdoctoral Fellowship (Garching, <i>declined</i>)	Dec 2021
ASTRO3D Excellence Award for most papers led by an ECR in Australia	Dec 2021
ANU Olin J Eggen Research Award for excellence in research (A\$2500)	Nov 2020
ANU RSAA Best Research Paper Award (A\$500)	Jul 2020
ANU Vice-Chancellor's Award for Impact and Engagement [Team Award]	Nov 2019
Australian Government Research Training Program Scholarship – International (A\$28000 p.a.)	Feb 2018
BITS Off-campus Research Thesis Scholarship (₹70000)	Jan 2018
University of Exeter UK Tier 5 Sponsorship (£7500)	Jan 2018
BITS Alumni Association Summer Scholarship (\$2500)	Mar 2017
BITS Best Graduating Student in Physics Award	Jan 2017

PROFESSIONAL SERVICE & COMMUNITY INVOLVEMENT

Organizer – Workshop on Numerical Recipes in Star Formation SOC and LOC Chair for Lorentz Center workshop on computational star formation	July 2025
Chair – LEAPS Summer Internship Program Committee Leiden Observatory and European Space Agency joint summer program	Nov 2022 – Nov 2023
Grant Reviewer Expert reviewer for Polish NSC (equivalent to US NSF or German DFG)	Feb 2023 – present
Journal Reviewer Reviewed manuscripts for Nature, Nature Astronomy, MNRAS, ApJ, A&A, OJA	Mar 2021 – present
Postdoc Representative – Leiden Observatory Represented 50 postdoctoral fellows within the Observatory Executive	Mar 2023 – Mar 2024
Student Ambassador – ANU College of Science Founding Member of the ANU Future Research Talent Program	Mar 2019 – Mar 2021
Student Representative – RSAA ANU PhD Selection Committee Reviewed PhD applications, interviewed and ranked shortlisted candidates	Jan 2021 – Jan 2022
Student Representative – RSAA ANU Cultural Reform Committee Drafted documents detailing RSAA values , behavior and breaches policies	Aug 2020 – Mar 2021
ANU Mount Stromlo Outreach Conducted Observatory tours, public lectures, stargazing, and public nights at Mt Stromlo	Aug 2017 – Nov 2021
Founder & Convener – CB Das Award in Physics Established the CB Das Award for best graduating student in Physics at BITS	Jun 2018 – present
McNamara-Saunders Astronomical Teaching Telescope Mentored high school students on astronomy projects as part of Science Mentors Canberra	Mar 2019 – Dec 2020

RESEARCH SUPERVISION

Songlin Li (Co-supervisor) Gas-phase metallicity of AGN host galaxies	PhD Student, ANU (2022 – 2025)
Kristian J. Melecio (Primary supervisor) Effects of cosmological accretion on ISM metallicity	M.Sc. Student, Leiden University (2025 –)
Eloy van de Genugten (Primary supervisor) ISM chemistry and radiative transfer at high redshifts	M.Sc. Student, Leiden University (2025 –)
Lisanne van Veenen (Primary supervisor) Metal-free stars in the first billion years	M.Sc. Student, Leiden University (2024 – 2025)
María Fernandez Pinar (Primary supervisor) Turbulence in dense gas near supermassive black holes	M.Sc. Student, Leiden University (2023)
Minh Ngoc Lê (Primary supervisor) Tracing dense gas in the ISM with chemistry	LEAPS summer student, Leiden University (2023)

SKILLS

Programming: Python, Fortran, IDL, Mathematica, C++
Codes & Softwares: FLASH*, Microphysics**, QUOKKA**, KROME*, GIZMO, AMReX⁺, GPUAstroChem**
SLUG, Despotic, Xspec, SDTrimSP, LZIFU, radmc3D
**core developer, ⁺GPU-enabled code*

INVITED SEMINARS & PRIZE TALKS

1. Dept. of Astronomy, Durham University (Durham, UK)	Apr 2025
2. Max Planck Institute for Gravitational Physics (Potsdam, Germany)	Mar 2025
3. ASTRON (Dwingeloo, Netherlands)	Feb 2025
4. Institute for Science and Technology (Vienna, Austria)	Dec 2024
5. IAU General Assembly PhD Prize Talk (Cape Town, South Africa)	Aug 2024
6. Centre for Computational Astrophysics, Flatiron Institute (New York, USA)	May 2024
7. Dept. of Astronomy, University of Wisconsin (Madison, USA)	Apr 2024
8. Kapteyn Astronomical Institute, Groningen University, (Groningen, Netherlands)	Oct 2023
9. Charlene Heisler Prize Talk , ASA Annual Meeting (Sydney, Australia)	Jul 2023
10. Dept. of Astronomy, University of Texas Austin (Austin, USA)	Aug 2023
11. Dept. of Physics & Astronomy, Uppsala University (Uppsala, Sweden)	Dec 2022
12. Hypatia Colloquium, European Southern Observatory (Garching, Germany)	Jun 2022
13. Astronomy Department, Yale University (New Haven, USA)	Jan 2022
14. Max Planck Institute for Astrophysics (Garching, Germany)	Dec 2021
15. CCAPP, Ohio State University (Columbus, USA)	Nov 2021
16. Hebrew University of Jerusalem (Jerusalem, Israel)	Sep 2021
17. Universidad de Concepción, Chile (Concepción, Chile)	Mar 2020

+ 13 Seminars at Institutes Across 7 Countries

CONFERENCES [SELECTED]

1. Workshop on molecules and planets in the outer Galaxy (Florence, Italy) [invited talk]	Nov 2024
2. Annual Meeting of the German Astronomical Society (Cologne, Germany) [invited talk]	Sep 2024
3. Gravitational waves & galactic chemical evolution (Lorentz Center) [invited panelist]	May 2024
4. Recent developments in the IMF (Sesto, Italy) [invited talk]	Mar 2024
5. Leiden Observatory Science Day (Leiden, Netherlands) [invited talk]	Oct 2023
6. Santa Cruz galaxy formation workshop (Santa Cruz, USA) [invited talk]	Aug 2023
7. European Astronomical Society Annual Meeting (Kraków, Poland) [3 talks]	Jul 2023
8. Olympian star formation symposium (Paralia Katerini, Greece) [long talk]	Jun 2023

+ 22 Conference Presentations Across 12 Countries

HIGH PERFORMANCE COMPUTING PROJECTS

Italian National Supercomputing Facility (CINECA): Co Investigator	Cycle 2025
High-resolution investigation of late Population III star formation [3.6 Million CPU hours]	
Flatiron Institute Supercomputing Facility USA (POPEYE): Co-Principal Investigator	Cycle 2025
The POPSICLE Project: the first and oldest stars [4.3 Million CPU hours]	
Dutch National Supercomputing Facility (Snellius): Lead Chief Investigator	Cycles 2024, 2025
The formation of the first stars in the Universe [2 Million CPU hours]	
National Computational Infrastructure Australia (Gadi): Chief Investigator	Cycles 2023, 2024
Star formation in a turbulent interstellar medium [3.7 Million (CPU+GPU) hours]	
Pawsey Australia (Setonix): Chief Investigator	Cycles 2023, 2024
Star formation in a turbulent interstellar medium [17.6 Million (CPU+GPU) hours]	
Texas Advanced Computing Centre USA (Frontera): Co-Principal Investigator	Cycle 2024
Star formation in a turbulent interstellar medium [575,000 CPU node hours]	
Oak Ridge National Lab USA (Summit+): Co Investigator	Cycle 2024
Star formation in a turbulent interstellar medium [115,000 CPU node hours]	

OBSERVING PROPOSALS

James Webb Space Telescope GO: Co-Investigator Metallicity of massive early metal-rich galaxies [10 hours]	Cycle 5 (2025, submitted)
Atacama Large Millimeter Array: Co-Investigator Tracing multiphase ISM in a massive galaxy at $z = 7.3$ [20 hours]	Cycle 12 (2025)
Issac Newton Group / WEAVE: Co-Investigator WEAVE-ing the Chemical Story of Local Dwarf Starbursts [23 hours]	Cycle 25B (2025)
James Webb Space Telescope GO: Co-Investigator Spectroscopy of quiescent galaxies at $z \sim 0.7$: A direct measurement of the IMF [30 hours]	Cycle 3 (2024)
Atacama Large Millimeter Array: Co-Investigator Multi- J CO survey of LMC SNRs [11 hours]	Cycle 8 (2021)
Chandra X-ray Observatory: Co-Investigator Measuring The Expansion of the LMC SNR N132D in X-rays [100 ks]	Cycle 23 (2021)
Chandra X-ray Observatory: Co-Investigator Legacy Survey to Map Fe Emission in the LMC SNR N132D <i>Chandra Large Program</i> [1000 ks]	Cycle 20 (2019)
Very Large Telescope / Multi Unit Spectroscopic Explorer: Co-Investigator The MAGPI Survey <i>MUSE Large Program</i> [224 hours]	P 106 (2019)

LIST OF PUBLICATIONS

FIRST AUTHOR REFEREED PUBLICATIONS [*h-index (first author) = 14*]

1. [Magnetic fields limit the mass of Population III stars even before the onset of protostellar radiation feedback](#)
Sharda, P., Menon, S. H., Gerasimov, R., Bromm, V., Burkhardt, B., Haemmerlé, L., van Veenen, L., and Wibking, B. D., [2025, *MNRAS Letters*, 541, 1](#) ([Link to media articles](#))
2. [Population III star formation in the presence of turbulence, magnetic fields, and ionizing radiation feedback](#)
Sharda, P., and Menon, S. H., [2025, *MNRAS*, 540, 1745](#)
3. [A path towards constraining the evolution of the interstellar medium and outflows in the Milky Way using APOGEE](#)
Sharda, P., Ting, Y. S., and Frankel, N., [2024, *MNRAS*, 532, 1](#)
4. [The interplay between feedback, accretion, transport and winds in setting gas-phase metal distribution in galaxies](#)
Sharda, P., Ginzburg, O., Krumholz, M. R., Forbes, J. C., Wisnioski, E., Mingozzi, M., Zovaro, H. R. M., and Dekel, A., [2024, *MNRAS*, 528, 2232](#)
5. [The impact of carbon and oxygen abundances on the metal-poor initial mass function](#)
Sharda, P., Amarsi, A. M., Grasha, K., Krumholz, M. R., Yong, D., Chiaki, G., Roy, A. and Nordlander, T., [2023, *MNRAS*, 518, 3985](#)
6. [First extragalactic measurement of the turbulence driving parameter: ALMA observations of the star-forming region N159E in the Large Magellanic Cloud](#)
Sharda, P., Menon, S. H., Federrath, C., Krumholz, M. R., Beattie, J. R., Jameson, K. E., Tokuda, K., Burkhardt, B., Crocker, R. M., Law, C. J., Seta, A., Gaetz, T. J., Pingel, N. M., Seitzzahl, I. R., Sano, H., and Fukui, Y., [2022, *MNRAS*, 509, 2180](#)
7. [When did the initial mass function become bottom-heavy?](#)
Sharda, P., and Krumholz, M. R., [2022, *MNRAS*, 509, 1959](#)
8. [Magnetic field amplification in accretion discs around the first stars: implications for the primordial IMF](#)
Sharda, P., Federrath, C., Krumholz, M. R., and Schleicher, D. R. G., [2021, *MNRAS*, 503, 2014](#)
9. [The role of gas kinematics in setting metallicity gradients at high redshift](#)
Sharda, P., Wisnioski, E., Krumholz, M. R., and Federrath, C., [2021, *MNRAS*, 506, 1295](#)
10. [On the origin of the mass-metallicity gradient relation in the local Universe](#)
Sharda, P., Krumholz, M. R., Wisnioski, E., Acharyya, A., Forbes, J. C., and Federrath, C., [2021, *MNRAS*, 504, 53](#)
11. [The physics of gas phase metallicity gradients in galaxies](#)
Sharda, P., Krumholz, M. R., Wisnioski, E., Forbes, J. C., Federrath, C., and Acharyya, A., [2021, *MNRAS*, 502, 5935](#)
12. [The importance of magnetic fields for the initial mass function of the first stars](#)
Sharda, P., Federrath, C., and Krumholz, M. R., [2020, *MNRAS*, 497, 336](#)
13. [Spatially resolved *Chandra* spectroscopy of the Large Magellanic Cloud supernova remnant N132D](#)
Sharda, P., Gaetz, T. J., Kashyap, V. L., and Plucinsky, P. P., [2020, *ApJ*, 894, 145](#)

14. [The role of the \$H_2\$ adiabatic index in the formation of the first stars](#)
Sharda, P., Krumholz, M. R., and Federrath, C., 2019, *MNRAS*, 490, 513
15. [Testing star formation laws on spatially resolved regions in a \$z \approx 4.3\$ starburst galaxy](#)
Sharda, P., da Cunha, E., Federrath, C., Wisnioski, E., Di Teodoro, E. M., Tadaki, K., Yun, M. S., Aretxaga, I., and Kawabe, R., 2019, *MNRAS*, 487, 4305
16. [Testing star formation laws in a starburst galaxy at redshift 3 resolved with ALMA](#)
Sharda, P., Federrath, C., da Cunha, E., Swinbank, A. M., and Dye, S., 2018, *MNRAS*, 477, 4380

REFEREED PUBLICATIONS [Major Contributions]

1. [Simulating Population III star formation during the Epoch of Reionization](#)
van Veenen, L., Sharda, P., Viti, S., & Menon, S. H., 2025, *A&A*, submitted (*Lead author under my direct supervision*)
2. [Cosmic Threads: Interlinking the Stellar Initial Mass Function from Star-Birth to Galaxies](#)
Jerabkova, T., Romano, D., Kroupa, P., André, P., Chruślińska, M., Fontanot, F., Hopkins, A., Jadhav, V., Lahén, N., Lee, Y.-N., Mucciarelli, A., Salvadori, S., Wang, L., Yan, Z., Andersen, M., Durrant, A., Louvet, F., Lyubenova, M., Matteucci, F., Sharda, P., van de Ven, G., and Vazdekis, A., 2025, *White Paper, Memorie della SAI*, submitted
3. [Microphysics: A set of microphysics routines for astrophysical simulation codes based on the AMReX library](#)
AMReX Team, Bishop, A., Fields, C. E., Chen, Z., Harpole, A., Jacobs, A. M., Johnson, E., Katz, M., Li, X., Malone, C., Sharda, P., Timmes, F., Wibking, B., Willcox, D., and Zingale, M., 2025, *Journal of Open Source Software*, under review
4. [The Leiden/ESA Summer Program for Astrophysics](#)
Bellotti, S., Sellek, A. D., Sharda, P., Dutkowska, K. M., Chrimes, A., and Röttgering, H., 2025, *Journal of Astronomical Education*, under review (*Astronomy educational impact paper*)
5. [Does the HCN/CO ratio gas trace fraction of gravitationally-bound gas?](#)
Bemis, A. R., Wilson, C. D., Sharda, P., and Roberts, I. D., 2025, *A&A*, 692, A146
6. [ALMA CO observations of gamma-ray supernova remnant N132D in the Large Magellanic Cloud: possible evidence for shocked molecular clouds illuminated by cosmic-ray protons](#)
Sano, H., Plucinsky, P. P., Bamba, A., Sharda, P., Filipović, M. D., Law, C. J., Alsaberi, R. Z. E., Yamane, Y., Tokuda, K., Acero, F., Sasaki, M., Vink, J., Inoue, T., Inutsuka, S., Shimoda, J., Tsuge, K., Fujii, K., Voisin, F., Maxted, N., Rowell, G., Onishi, T., Kawamura, A., Mizuno, N., Yamamoto, H., Tachihara, K., and Fukui, Y., 2020, *ApJ*, 902, 53
7. [Transition elements in supernova pre-solar grains](#)
Marhas, K. K., and Sharda, P., 2018, *ApJ*, 853, 12
8. [Offset fed slot antenna for broadband operation](#)
Kumar, R., Sharda, P., and Kumar, A. P. V., 2018, *Material Science & Engineering*, 331, 012022

REFEREED PUBLICATIONS [Minor Contributions]

1. [The MAGPI survey: forward modelled gas-phase metallicity gradients in galaxies at \$z \sim 0.3\$](#)
Mai, Y., Croom, S., Wisnioski, E., Battisti, A., Mendel, J., Mun, M., Foster, C., Harborne, K., Lagos, C. D. P., Breda, I., Gao, T., Grasha, K., Mukherjee, T., Poci, A., Remus, R.-S., Sharda, P., Sweet, S. M., Thater, S., Valenzuela, L. M., van de Ven, G., Zafar, T., and Ziegler, B., 2025, *MNRAS*, under review

2. [Chandra Large Project Observations of the Supernova Remnant N132D: Measuring the Expansion of the Forward Shock](#)
Long, X., Plucinsky, P. P., Gaetz, T. J., Kashyap, V. L., Bamba, A., Blair, W. P., Castro, D., Foster, A. R., Law, C. J., Milisavljevic, D., Miller, E. D., Patnaude, D., Sasaki, M., Sano, H., **Sharda, P.**, Williams, B. F., Williams, B. J., and Yamaguchi, H., [2025, *ApJ*, accepted](#)
3. [The MAGPI survey: Evolution of radial trends in star formation activity across cosmic time](#)
Mun, M., Wisnioski, E., Battisti, A., Mendel, J., Ellison, S., Taylor, E., Lagos, C. D. P., Harborne, K., Foster, C., Croom, S., Bellstedt, S., Barsanti, S., Gupta, A., Valenzuela, L., Chen, Q -H., Grasha, K., Mukherjee, T., Park, H -J., **Sharda, P.**, Sweet, S. M., Remus, R -S., and Zafar, T., [2024, *MNRAS*, 530, 5072](#)
4. [The MAGPI survey: effects of spiral arms on different tracers of the interstellar medium and stellar populations at \$z \approx 0.3\$](#)
Chen, Q- H., Grasha, K., Battisti, A. J., Wisnioski, E., Mendel, T., **Sharda, P.**, Santucci, G., Li, Z., Foster, C., Mun, M., Park, H- J., Tsukui, T., Sharma, G., Lagos, C. D. P., Barsanti, S., Valenzuela, L. M., Gupta, A., Thater, S., Jin, Y., and Kewley, L., [2024, *MNRAS*, 527, 2991](#)
5. [ALMA Observations of Supernova Remnant N49 in the Large Magellanic Cloud. II. Non-LTE Analysis of Shock-heated Molecular Clouds](#)
Sano, H., Yamane, Y., van Loon J. K., Furuya, K., Fukui, Y., Alsaberi, R. Z. E., Bamba, A., Enokiya, R., Filipović, M. D., Indebetouw, R., Inoue, T., Kawamura, A., Lakićević, M., Law, C. J., Mizuno, N., Murase, T., Onishi, T., Park, S., Plucinsky, P. P., Rho, J., Richards, A. M. S., Rowell, G., Sasaki, M., Seok, J., **Sharda, P.**, Staveley-Smith, L., Suzuki, H., Temim, T., Tokuda, K., Tsuge, K., Tachihara, K., [2023, *ApJ*, 958, 53](#)
6. [The MAGPI Survey: Drivers of kinematic asymmetries in the ionised gas of \$z \sim 0.3\$ star-forming galaxies](#)
Bagge, R. S., Foster, C., Battisti, A., Bellstedt, S., Mun, M., Harborne, K., Barsanti, S., Mendel, J. T., Brough, S., Croom, S. M., Lagos, C. D. P., Mukherjee, T., Peng, Y., **Sharda, P.**, Thater, S., Valenzuela, L. M., Wisnioski, E., Zafar, T., and Ziegler, B., [2023, *PASA*, 40, 60](#)
7. [The MAGPI Survey: Impact of environment on the total internal mass distribution of galaxies in the last 5 Gyr](#)
Derkenne, C., McDermid, R. M., Poci, A., Mendel, J. T., D'Eugenio, F., Jeon, S., Remus, R.-S., Bellstedt, S., Battisti, A. J., Bland-Hawthorn, J., Ferré-Mateu, A., Foster, C., Lagos, C. D. P., Peng, Y., **Sharda, P.**, Sharma, G., Sweet, S. M., Tran, K.-V. H., Valenzuela, L. M., Vaughan, S., Wisnioski, E., and Yi, S. K., [2023, *MNRAS*, 522, 3602](#)
8. [The MAGPI survey: Science goals, observing strategy, results and theoretical framework](#)
Foster, C.; Mendel, J. T., Lagos, C. D. P., Wisnioski, E., Yuan, T., D'Eugenio, F., Barone, T. M., Harborne, K. E., Vaughan, S. P., Schulze, F., Remus, R.-S., Gupta, A., Collacchioni, F., Khim, D. J., Taylor, P., Bassett, R., Croom, S. M., McDermid, R. M., Poci, A., Battisti, A. J., Bland-Hawthorn, J., Bellstedt, S., Colless, M., Davies, L. J. M., Derkenne, C., Driver, S., Ferré-Mateu, A., Fisher, D. B., Gjergo, E., Johnston, E. J., Khalid, A., Kobayashi, C., Oh, S., Peng, Y., Robotham, A. S. G., **Sharda, P.**, Sweet, S. M., Taylor, E. N., Tran, K.-V. H., Trayford, J. W., van de Sande, J., Yi, S. K., and Zanisi, L., [2021, *PASA*, 38, e031](#)

Journal Abbreviations

MNRAS – Monthly Notices of the Royal Astronomical Society

ApJ – The Astrophysical Journal

A&A – Astronomy & Astrophysics

PASA – Publications of the Astronomical Society of Australia