

# CHAYAN CHATTERJEE

## CONTACT DETAILS

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## CURRENT POSITION

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**A.I. for New Messengers Postdoctoral Research Fellow** December 2023 - present

Joint appointment with the Department of Physics and Astronomy, and Data Science Institute, Vanderbilt University, United States of America.

## EDUCATION

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- **Doctor of Philosophy in Physics** February 2020 - November 2023  
The University of Western Australia, Australia  
**Thesis title:** [Enabling rapid discovery of gravitational waves using machine learning](#).  
**Supervisors:** Prof. Linqing Wen, Prof. Amitava Datta.
- **Master of Science in Physics** 2016 - 2018  
Presidency University, Kolkata, India  
**Specialization:** Astrophysics and Cosmology  
**Thesis:** Dark matter self interaction and its impact on large scale structures.  
**List of Courses:** [http://www.presiuniv.ac.in/web/Physics\\_MSc.pdf](http://www.presiuniv.ac.in/web/Physics_MSc.pdf)
- **Bachelor of Science (Hons) in Physics** 2013 - 2016  
Presidency University, Kolkata  
**Thesis:** The Hertzsprung-Russell diagram of stars in the SDSS Stripe-82 Catalog.  
**List of Courses:** [http://www.presiuniv.ac.in/web/Physics\\_BSc\\_Major.pdf](http://www.presiuniv.ac.in/web/Physics_BSc_Major.pdf)

## PUBLICATIONS

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*Citations from Google Scholar*

1. “Pretrained Audio Transformer as a Foundational AI Tool for Gravitational Waves” - Chayan Chatterjee *et al* (2024) [[ArXiv:2412.20789](#)].
2. “No Glitch in the Matrix: Robust Reconstruction of Gravitational Wave Signals Under Noise Artifacts” - Chayan Chatterjee and Karan Jani (2024)[[ArXiv:2412.17185](#)].
3. “Navigating Unknowns: Deep Learning Robustness for Gravitational Wave Signal Reconstruction” - Chayan Chatterjee and Karan Jani (2024)[[Astrophys. J, 973 112](#)].
4. “Reconstruction of binary black hole harmonics in LIGO using deep learning” - Chayan Chatterjee and Karan Jani (2024) [[Astrophys. J, 969 25](#)] - Citations: 1.
5. “Pre-merger sky localization of gravitational waves from binary neutron star mergers using deep learning” - Chayan Chatterjee and Linqing Wen (2023) [[Astrophys. J, 959 76](#)] - Citations: 3.

6. “*Rapid localization of gravitational wave sources from compact binary coalescences using deep learning*” - Chayan Chatterjee, Linqing Wen, Damon Beveridge, Foivos Diakogiannis, Kevin Vinsen (2023) [[Astrophys. J, 959 42](#)] - Citations: 4.
7. “*Rapid mass parameter estimation of binary black hole coalescences using deep learning*” - Alistair McLeod, Daniel Jacobs, Chayan Chatterjee, Linqing Wen, and Fiona Panther (2022). [[ArXiv:2201.11126](#)] - Under review in *Physical Review D*.
8. “*Extraction of binary black hole gravitational wave signals from detector data using deep learning*” - Chayan Chatterjee, Linqing Wen, Foivos Diakogiannis, Kevin Vinsen (2021) [[Phys. Rev. D 104, 064046](#)] - Citations: 25.
9. “*Enhancing gravitational-wave science with machine learning*” - Elena Cuoco et al. (2020) [[2021 Mach. Learn.: Sci. Technol. 2 011002](#)] - Citations: 155.
10. “*Using deep learning to localize gravitational wave sources*” - Chayan Chatterjee, Linqing Wen, Kevin Vinsen, Manoj Kovalam, Amitava Datta (2019) [[Phys. Rev. D 100, 103025](#)] - Citations: 41.

## SCHOLARSHIPS AND AWARDS

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1. **A.I. for New Messengers Postdoctoral Fellowship 2023** - Postdoctoral Fellowship by Vanderbilt University (2023-2026).
2. **UWA Postgraduate Student Association Travel Award** - for international academic visits and conference participation (2023).
3. **OzGrav Travel Award** - for international academic visits and conference participation (2022).
4. **UWA Postgraduate Student Association Research Week Best Talk Award** - Runner-Up (2022).
5. **J-P Macquart Best Student Talk Award** - The Australian National Institute for Theoretical Astrophysics Conference - Runner-Up (2022) and Winner (2021).
6. **Australian Mathematical Sciences Institute Summer School - Best Student Talk Award** - Winner (2022).
7. **OzGrav Outreach Superstar Award (UWA)** - Winner (2021).
8. **The University of Western Australia Three Minute Thesis (3MT) Competition Award** - Winner (2020) and **People’s Choice Award** - Winner (2020).
9. **Scholarship for International Research Fees and International Living Allowance Scholarship for 2020** - Awarded by The University of Western Australia.

## COMMITTEE AND ACADEMIC SERVICES

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1. **Co-judge** - Visualize Your Thesis Competition, The University of Western Australia (2024).
2. **Program Chair** - Gravitational Wave Inference Research Program, OzGrav - ARC Center of Excellence for Gravitational Wave Discovery (2023).
3. **Journal Referee** - The Astrophysical Journal Letters, International Journal of Modern Physics D, Science China Physics, Mechanics and Astronomy.
4. **Committee Member** - Australian National Institute for Theoretical Astrophysics (2021 - 2022).
5. **Early Career Researcher Representative** - OzGrav, University of Western Australia (2021 - 2022).

6. **Postgraduate Student Research Representative** - Postgraduate Student Association, University of Western Australia Student Guild (2020 - 2021).
7. **Mentor and Organizer of NASA Space Apps Challenge, Perth** (2021).
8. **Co-ordinator of Presidency University Physics League** - Official Physics club run by students of the Department of Physics, Presidency University (2015 - 2017).

## TEACHING/SUPERVISION

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1. **Lecturer** - Gravitational Wave Astronomy (PHYS4420) at University of Western Australia. 2022-2023
2. **Teaching Facilitator** - Our Universe (SCIE1121) at University of Western Australia. 2020 - 2023.
3. **Research Supervision** - Summer Down Under Research Internship (SDURI), student dissertations at University of Western Australia. 2020 - 2023.

## INVITED TALKS

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1. *“Decoding the Cosmic Orchestra: Reconstruction and Parameter Estimation of Gravitational Waves Using Deep Learning”*  
University of Glasgow, Scotland - IGA seminar talk May, 2024
2. *“Rapid Sky Localization and Waveform Extraction of Gravitational Waves Using Deep Learning”*  
Vanderbilt University, USA - Department of Physics and Astronomy seminar talk February, 2023
3. *“Rapid Sky Localization and Waveform Extraction of Gravitational Waves Using Deep Learning”*  
Monash University, Australia - Gravitational Wave Astronomy group seminar talk March, 2023
4. *“Rapid Sky Localization of Gravitational Waves Using Deep Learning”*  
Machine Learning Applications in Astronomy (MLAA) group seminar talk (online) May, 2023

## SELECTED INTERNATIONAL CONFERENCE PRESENTATIONS

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1. Oral presentation, *“Navigating Unknowns: Deep Learning Robustness for Gravitational Wave Signal Reconstruction”* at LIGO-Virgo-KAGRA meeting (online) September, 2024.
2. Oral presentation, *“Reconstruction of Binary Black Hole Harmonics in LIGO Using Deep Learning”* at LIGO-Virgo-KAGRA meeting, USA March, 2024.
3. Oral presentation, *“Real-time and pre-merger sky localization of gravitational waves from compact binary coalescences using deep learning”* at 241st American Astronomical Society (AAS) Meeting January, 2023.
4. Oral presentation, *“Real-time localization of gravitational waves from compact binary coalescences using deep learning”* at American Physical Society (APS) April Meeting April, 2022.

## INVITED OUTREACH ACTIVITIES AND MEDIA RELEASES

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1. Featured research [news article](#) from Vanderbilt University (2024).
2. Invited guest at talk show - *Curiosity Killed the Rat* (2021)
3. Invited guest at podcast - *Astrophiz: An Astronomy Podcast* (2021)
4. Invited guest at science talk show - *The Uncertainty Principle Presents: Science After Dark* - Perth Fringe Festival (2021).
5. Featured article - *“Algorithms now helping find Gravitational Wave sources”* - Space Australia (2019).

**SKILLS**

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<b>Languages</b>	Bengali (native), English (bilingual, fluent), Hindi (advanced).
<b>Programming Languages</b>	Python, FORTRAN, GNU Bash, L <sup>A</sup> T <sub>E</sub> X.
<b>Software Experience</b>	TensorFlow, PyTorch, LALInference, BILBY, GADGET2.
<b>Operating Systems</b>	Linux (Ubuntu), Windows.