CHAYAN CHATTERJEE

CONTACT DETAILS

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CURRENT POSITION

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

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

EDUCATION

- **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

- **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

PUBLICATIONS

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

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

1. **Journal Referee** - *The Astrophysical Journal Letters, International Journal of Modern Physics D, Astrophysics and Space Science, Science China Physics, Mechanics and Astronomy.*

2. **Program Chair** - Gravitational Wave Inference Research Program, OzGrav - ARC Center of Excellence for Gravitational Wave Discovery (2023).

3. **Committee Member** - Australian National Institute for Theoretical Astrophysics (2021 - 2022).

4. **Early Career Researcher Representative** - OzGrav, University of Western Australia (2021 - 2022).

5. **Postgraduate Student Research Representative** - Postgraduate Student Association, University of Western Australia Student Guild (2020 - 2021).

6. **Co-judge** - *Visualize Your Thesis Competition, The University of Western Australia (2024).*
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

1. **Research Supervision** - Thesis advisor for several PhD, Masters and undergraduate students. 2020 - present.
2. **Lecturer** - Black Holes in Our Universe (ASTR-2190), Vanderbilt University. 2024- present.
3. **Lecturer** - Gravitational Wave Astronomy (PHYS4420), University of Western Australia. 2022-2023
4. **Teaching Facilitator** - Our Universe (SCIE1121), University of Western Australia. 2020 - 2023.

INVITED TALKS

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

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 Harmomics 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

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

Languages	Bengali (native), English (bilingual, fluent), Hindi (advanced).
Programming Languages	Python, FORTRAN, GNU Bash, LaTeX.
Software Experience	TensorFlow, PyTorch, LALInference, BILBY, GADGET2.
Operating Systems	Linux (Ubuntu), Windows.