

# Tanima Duary

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[LinkedIn](#) | [Google Scholar](#)

## PROFESSIONAL SUMMARY

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- **Research Scientist** having a strong foundation in **theoretical cosmology** and **thermodynamical modeling** with expertise in leading and conducting intricate research.
- Experienced in designing advanced research models and executing \*\*\*, with a proven track record of publishing in peer-reviewed journals.
- Highly proficient in computational methodologies to drive innovation and solve complex challenges.
- Strong ability to adapt and learn within a dynamic and collaborative environment.

## EDUCATION

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- June 2024      **Ph.D. in Physics (Cosmology)**  
**Indian Institute of Science Education and Research Kolkata** – Kolkata, WB
- Department of Physical Sciences
  - **Dissertation:** *Thermodynamical Aspects of Some Cosmological Models.*
- June 2017      **Master of Science in Physics**  
**Indian Institute of Science Education and Research Kolkata** – Kolkata, WB
- Department of Physical Sciences
  - **Thesis:** *Thermodynamics of Cosmological Models.*
- July 2014      **Bachelor of Science in Physics**  
**Scottish Church College, Calcutta University** – Kolkata, WB
- Physical Sciences Department

## SKILLS

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- **Research Methodologies**
  - Developed a comprehensive theoretical framework to analyze the thermodynamic aspects of cosmological models, integrating principles from thermodynamics, and general relativity.
  - Explored how thermodynamic considerations influence the viability and dynamics of these models, shedding light on the underlying mechanisms driving cosmic evolution.
- **Computational Proficiency**
  - **Software:** Wolfram Mathematica, OriginLab, Microsoft Office, Adobe Photoshop, ImageJ, gnuplot
  - **Programming Languages:** Python, C, Fortran
- **Analytical and Problem Solving**
  - Systematic Research Approach
  - Data Interpretation and Analysis
- **Communication and Collaboration**
  - Academic Presentations and Publications
  - Project Management
  - Teamwork and Collaboration

## WORK EXPERIENCE

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- 08/2017 –      **Doctoral Research Fellow**  
06/2024      **Indian Institute of Science Education and Research Kolkata** – Kolkata, WB, India
- **Explored** the Generalized Second Law of thermodynamic (GSL) viability of quintessence models which give rise to late-time cosmic acceleration using Hayward-Kodama temperature as the temperature of apparent horizon.
  - **Investigated and analyzed** the thermodynamic viability of Brans-Dicke theory in Einstein frame for dust dominated era.
  - **Explored GSL viability** of cosmological models reconstructed from jerk parameter.
  - **Analyzed thermodynamic stability** of a cosmological model that mimics  $\Lambda$ CDM model.

- **Participated in regular meetings** with project supervisors, providing progress updates and discussing potential challenges or areas for improvement.

07/2014 – **Master Research Fellow**

07/2017 **Indian Institute of Science Education and Research Kolkata** – Kolkata, WB, India

- **Explored** the physics of black-hole thermodynamics.
- **Investigated** the thermodynamic viability of quintessence models which give rise to late-time cosmic acceleration using Hawking temperature as the temperature of apparent horizon.

05/2016 – **Graduate Teaching Assistant**

01/2016 **Indian Institute of Science Education and Research Kolkata** – Kolkata, WB, India

- **Operated** in the role of teaching assistant, provided valuable support to faculty members and contributed to the academic development of undergraduate students across a range of physics courses, such as, Thermodynamics & Statistical Mechanics, Electronics, and General Relativity.
- **Established strong connections** with students by maintaining open communication and promoting an inclusive learning atmosphere.

## AWARDS AND AFFILIATIONS

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- CSIR (Council of Scientific & Industrial Research) NET Fellowship, **2012 – 2017**.
- DST (Department of Science and Technology) Inspire SHE (Scholarship for Higher Education) Fellowship, **2011 – 2012**.

## PUBLICATIONS

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### Peer-Reviewed Articles

1. **Duary, Tanima**, Narayan Banerjee, and Ananda Dasgupta. "Signature flip in deceleration parameter: a thermodynamic phase transition?" *The European Physical Journal C* 83, no. 9 (2023): 815.
2. **Duary, Tanima**, and Narayan Banerjee. "Cosmological models reconstructed from jerk: a thermodynamic analysis." *New Astronomy* 92 (2022): 101726.
3. **Duary, Tanima**, and Narayan Banerjee. "Brans–Dicke cosmology: thermodynamic viability." *The European Physical Journal Plus* 135, no. 1 (2020): 1-9.
4. **Duary, Tanima**, Ananda Dasgupta, and Narayan Banerjee. "Thawing and freezing quintessence models: a thermodynamic consideration." *The European Physical Journal C* 79 (2019): 1-7.

### Conference Proceedings

1. 10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023). [*Talk*]
2. 32<sup>nd</sup> meeting of the Indian Association for General Relativity and Gravitation (IAGRG32, 2022). [*Poster*]
3. 31<sup>st</sup> meeting of the Indian Association for General Relativity and Gravitation (IAGRG31, 2020). [*Poster*]
4. SERB Preparatory School in Theoretical High Energy Physics in India (2018). [*Participant*]
5. Advanced School on Gravitational Waves in Presidency University, India (2016). [*Participant*]

## LANGUAGES

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- **English** ██████████ ██████████ ██████████ ██████████ ██████████
- **Bengali** ██████████ ██████████ ██████████ ██████████ ██████████
- **Hindi** ██████████ ██████████ ██████████ ██████████ ██████████
- **Spanish** ██████████ ██████████ ██████████ ██████████ ██████████