

Debaiudh Das

Education

- 2016–2021 **Integrated Masters Degree.**
NISER, Homi Bhabha National Institute, Bhubaneswar, India
CGPA : 7.1
TOEFL Score : 117/120
GRE Score : 316/340
- 2013–2015 **Indian School Certificate Examination.**
St. Joan's School, Kolkata, **88.25%**
- 2011–2013 **Indian Council of Secondary Examination.**
St. Joan's School, Kolkata, **92.6%**

Technical Skills

- Languages Java, C, C++, Python, HTML/CSS, Visual Basic
OS Microsoft Windows, Linux and other UNIX-like environments
Softwares Mathematica, L^AT_EX, Origin, gnuPlot

Research Experience

- Currently **Reading Group**, Topics from Black Hole information paradox.
Active
- September 2021 (Virtual) **School**, Cracow School of Theoretical Physics.
- 18 January 2021 to 22 January 2021 **Program**, ICTS, Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography (ONLINE).
- 16-20 Nov 2020 (Virtual) **Workshop**, YITP, YITP workshop on Strings and Fields 2020.
- April 2020 - May 2021 **MSc. Thesis Project under Prof. Yogesh K. Srivastava**, NISER, Bhubaneswar, Black Holes in String Theory.
- Derivation of the Reissner Nordstrom metric and horizon boundedness
 - Studying geometrical properties of black hole and their dynamical stability in context of black hole thermodynamics
 - Studying Evaporating black holes and the second law of black hole thermodynamics, formulation of the information loss problem
 - Study of possible resolutions-Fuzzballs, Remnants and signatures in Hawking radiation
 - Study and derivation of parts of detailed discussions of AdS_3 black holes and their connection to 2d conformal field theories through the Ads/CFT correspondence
 - Derivation of BPS m-branes and D-brane solutions
 - Strominger Vafa entropy matching and derivation of AdS/CFT correspondence
 - (Ongoing for publication) Analysis of continuous distribution of KK monopoles and its attendant singularities

- Jan'20– **Course Project under Prof. Yogesh K. Srivastava, NISER, Bhubaneswar,**
 July'20 Conformal Field Theory in Higher Dimensions.
- Introduction to the Conformal Group and transformations
 - Derivation of the generators and their commutation relations for conformal transformations
 - Deriving the equivalence of Scale - Conformal invariance
 - Properties of Euclidean Quantum mechanics and Poincare invariant QFT (radial quantization)
 - Deriving State-Operator correspondence as conjugate rules for conformal algebra
 - Studying the Embedding Formalism
- 26,Dec'19– **Solar Physics Workshop conducted by IUCAA, Wayanad, Kerela,**
 29,Dec'19 Science of the star in our backyard: introduction and data analysis Workshop.
- Introduction to Solar Physics and Solar System
 - Star-Planet Interaction and Helioseismology
 - Derivations in Magneto-Hydrodynamics
 - Solar flares and CMEs
 - Radiative Transfer, LTE and Non-LTE, line formation
- June'19– **Summer Project under Prof. Abhishek Majhi, ISI, Kolkata,**
 August'20 Some calculations in fundamental physics.
- Derivation and formulation of back reaction in central force problems
 - Treatment of accelerated observers in special relativity
 - Calculated perihelion shift due to general relativity with correction terms from back reaction
- Sept'18– **Semester Project under Prof. Yogesh K. Srivastava, NISER, Bhubaneswar,**
 May'19 General Relativity and analysis of Kerr Black Holes.
- Studied General relativity - Equivalence principle, curved spacetimes and Geodesics
 - Learned how to formulate Einstein's equation and properties of Schwarzschild Geometry from Eddington Finkelstein coordinates, Penrose Diagrams and Kruskal Szekeres coordinates
 - Derivation of frame dragging effects, gyroscopes and geodetic precession. Learned Cosmic censorship conjecture, properties of Kerr Geometry and the Penrose Process
- June'18– **Summer and Winter Project under Prof. Raghunathan Srianand, IUCAA, Pune,**
 July'18,Dec'18 Clustering study of IGM using Mg Spectroscopic lines.
- Studied introductory cosmology and use of spectroscopic probes
 - Studying and simulating the Voigt profile for QSO spectra
 - Simulating emission distribution for QSO background spectra using python from BOSS SDSS data
- May'18– **Summer Project under Prof. Prasanta K. Panigrahi, IISER, Kolkata,**
 June'18 Quantum Game Simulation in IBM Quantum Experience.
- Came up with a quantum algorithm for solving a generalized N-queen game using qubit search algorithms
- July'17– **Summer Project under Prof. Ananda Hota, UMDAE-CEBS, Mumbai,**
 August'17 Radio Astronomy Theory and Methods.
- Learned analyzing FITS data (GMRT) using DS9 and other basic astrophysics theory

Major Courses Undertaken

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| Physics (MSc.) | ○ Mathematical Methods 1 and 2 | ○ Classical Mechanics 1 and 2 |
| | ○ Electromagnetism 1 and 2 | ○ Quantum Mechanics 1 and 2 |
| | ○ Special Theory of Relativity | ○ Quantum Field Theory 1 and 2 |
| | ○ Condensed Matter Physics | ○ Nuclei and Particle Physics |
| | ○ Atoms, Molecules and Radiation | ○ Electronics |
| | ○ Statistical Mechanics | ○ Quantum Information and Computation |
| | ○ General Relativity and Cosmology | ○ Astronomy and Astrophysics |
| | ○ Special Topics in Quantum Mechanics | ○ Particle Physics |
| | ○ Phase transitions | ○ Introduction to Cosmology (Audited) |

Mathematics	<ul style="list-style-type: none"> ○ Probability Theory ○ Linear Algebra (Audited) 	<ul style="list-style-type: none"> ○ Introduction to Manifolds ○ Group Theory (Audited)
Computer Science	<ul style="list-style-type: none"> ○ Theory of Computation 	<ul style="list-style-type: none"> ○ Machine Learning
Lab	<ul style="list-style-type: none"> ○ General Physics Lab ○ Electronics Lab ○ Nuclear Physics Lab ○ Computational Lab 	<ul style="list-style-type: none"> ○ Optics Lab ○ Advanced Electronics Lab ○ Solid State Lab ○ Modern Physics Lab
Open Ended Lab	<ul style="list-style-type: none"> ○ Study of Two-level Quantum Systems using Classical Coupled Oscillators ○ Study of Earth's Field Nuclear Magnetic Resonance Imaging ○ Study of Optical Fibers and their various modes ○ Study of Open Cavity Helium Neon Laser and measuring the speed of light 	
Audited from ICTS, India	Black Hole information problem (Online course taken by Prof. Suvrat Raju)	

Certificates and Others

- 1 Participated in "Vijyoshi-2017 National Science Camp" organized by DST
- 2 Participated in "All India Asteroid Search Campaign" and had two preliminary discovery of asteroids conducted by International Astronomical Search Collaboration
- 3 Participated in "National Students' Space Challenge '17" held at IIT KGP
- 4 Active member of Science Activities Club, Niser and worked as telescope handler at International Olympiad on Astronomy and Astrophysics (IOAA) 2016

Scholarships

- 1 Kishore Vigyan Protsahan Yojna (KVPY), 2017-2021
- 2 DST DISHA Fellowship, 2016-17

Publication

arXiv:1806.10221 [quant-ph] "A Novel Quantum N-Queens Solver Algorithm and its Simulation and Application to Satellite Communication Using IBM Quantum Experience" Rounak Jha, Debaiudh Das, Avinash Dash, Sandhya Jayaraman, Bikash K. Behera, Prasanta K. Panigrahi.

References

Prof. Yogesh K. Srivastava
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Prof. Kishore B. Marathe
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