Biprateep Dey

Curriculum Vitae

■■■ ## Education

2018–present	**Graduate Student**, *University of Pittsburgh*, Pittsburgh, PA, USA.
2013–2018	**Integrated MSc. in Physics**, *National Institute Of Science Education and Research (NISER)*, Bhubaneswar, Odisha, India.

■■■ ## Research Experience

Ongoing — **Master's Thesis**, *Guide- Dr. Nishikanta Khandai*, Reader, NISER, Bhubaneswar, India.
Title: Machine Learning Based Predictors for Galaxy Properties
- Development of a classification scheme for galaxies on the basis of their photometric and spectroscopic properties as obtained from the SDSS and ALFALFA surveys.
- Devise predictors for galaxy properties like cold gas densities (HI) using Machine Learning.
- Generalizing the above approach to devise predictors for galaxy properties which are unmeasurable due to observational constraints.

May-August 2017 — **Summer Internship as MITACS Globalink Research Fellow**, *Guide- Dr. Erik Rosolowsky*, Associate professor, University of Alberta, Edmonton, Canada.
Title: Exploring the Star Formation Law using Machine Learning
- Worked on expanding the empirical Kennicutt-Schmidt Law (Star Formation Law) by including more variables to form a robust and nearly universal law.
- Performed Machine learning based variable selection on a huge catalog of physical variables for galaxies provided by the EDGE-CALIFA survey.
- Demonstrated that stellar surface density has equal contribution towards star formation as gas surface density.

(*manuscript currently under preparation for publication. Poster available* here)

March-April 2017 — **Research Based Laboratory Course Work**, *Guide: Dr. Ashok Mohapatra*, Reader, NISER, Bhubaneswar, India.
Title: Study of Geometric Phase using Classical Coupled Oscillators
- Co-developed an experimental setup to demonstrate the evolution of the states of a Quantum Mechanical two-level system using the analogy of classical coupled oscillators.
- Developed a method to study and demonstrate the geometric phase associated with the cyclic dynamics of a classical system of coupled oscillators using the above mentioned setup.
- The experimental setup can be used as a teaching tool aimed towards undergraduate students to illustrate the evolution of quantum mechanical two-level systems using classical analogies and has been incorporated in the undergraduate curriculum of NISER, Bhubaneswar, India.

(*Accepted for publication in the European Journal of Physics. Accepted manuscript available* here)

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Ongoing from June 2016	**Summer Internship**, *Guide- Dr.Yashwant Gupta, Senior professor and Dean GMRT Observatory*, NCRA-TIFR, Pune, India.

Title: Pulsar and Transient search using the upgraded GMRT

○ Worked on developing a fully real time radio transient detection pipeline for the uGMRT, which is currently in the final stages of testing.

○ Developed tessellation scheme for optimum coverage of sky area for pulsar survey observations using the upgraded Giant Metrewave Radio Telescope (uGMRT)

○ Am responsible for planning and management (both at the observatory and remotely) of more than 125 hours of pulsar survey observations.

○ Developed observation management software to automatically plan and keep track of observations for the ongoing all sky survey for pulsars and transients using the uGMRT.

○ Actively involved in pulsar survey data reduction, analysis and verification of new pulsar candidates.

Publications and Poster Presentation

Publication	**Study of Geometric Phase using Classical Coupled Oscillators**, *Sharba Bhattacharjee*, **Biprateep Dey** *and Ashok K. Mohapatra*, European Journal of Physics, 2018. Accepted manuscript available here.
Poster Presentation	**Exploring the Star Formation Law using Machine Learning**, **Biprateep Dey**, *Erik Rosolowsky and the EDGE-CALIFA Collaboration*, at the University of Alberta Undergraduate Research Symposium (manuscript currently under preparation for publication. Poster available here).

Fellowships and Achievements

2017	**MITACS Globalink research fellowship**, The fellowship is awarded to top ranking undergraduate students to conduct a fully funded 12 week research internship at a Canadian university.
2016	**Winner of quiz on optics and photonics**, at Conference on Optics and Photonics, Optical Society of America, NISER Students Chapter .
2014-Present	**Kishore Vaigyanik Protsahan Yojana (KVPY) Fellow**, *(Translation: Young Scientist Encouragement Program), Department of Science and Technology, Govt. of India*, The fellowship is awarded to about 50 best students of sciences at the undergraduate level all over India. Secured an all India rank of 7.
December 2014	**Best Experiment Presentation**, *at Astronomy Winter School conducted by NCRA-TIFR and IUCAA, Pune, India. Slides available here* .
2013	**Best High School Student of the Year**, *Ramakrishna Mission Vidyalaya, Agartala, India.*

Conferences and Workshops attended

2017 Annual Meeting of the Canadian Astronomical Society, *May 30 to June 1, 2017*, University of Alberta, Edmonton Canada.

Conference on Optics and Photonics Technology, *November 25, 2016*, Optical Society of America (OSA), NISER Students chapter, Bhubaneswar, India.

Science with uGMRT, *June 15 to 17, 2016*, National Centre for Radio Astrophysics (NCRA-TIFR), Pune, India.

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Pulsar Observatory for Students Camp, *October 22 to 25 and December 27 to 30, 2015*, Ooty Radio Telescope, Radio Astronomy Centre, NCRA-TIFR, Ooty, Tamil Nadu,India.

Radio Astronomy Winter School, *December 22 to 31, 2014*, IUCAA and NCRA-TIFR, Pune, India.

National Science (Vijyoshi) Camp, *November 10 to 12, 2014*, Indian Institute of Science Education and Research (IISER), Kolkata.

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