SNEH PANDYA

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EDUCATION

University of Illinois at Urbana-Champaign **May 2021**
Bachelor of Science in Engineering Physics, Professional Option in Physics **GPA: 3.74/4.00**
Minors in Mathematics & Astronomy
Dean's List SP2018 & SP2020

- Achieved GPA that ranks in top 20% of the College of LAS

PUBLICATIONS

[1] AGNet: Weighing Black Holes with Machine Learning **[**short paper: **NeurIPS 2020** ML4Physical Sciences workshop/ arXiv: 2011.15095] Joshua Yao-Yu Lin*, **Sneh Pandya***, Devanshi Pratap, Xin Liu, Matias Carrasco Kind
**equal contribution*

TALKS AND POSTERS

AGNet: Weighing Black Holes with Machine Learning

- NeurIPS Workshop Poster Presentation [December 2020] **[**Video][Poster]
- SPIN Lightning Talk [November 2019, October 2020]
- Undergraduate Research Symposium [April 2020] [Video][Poster]
- Undergraduate Research Symposium [July 2020] [Article]

AWARDS AND RECOGNITION

Fiddler Innovation Undergraduate Fellowship Award September 2020

- $1500 award awarded to undergraduate students showing outstanding contributions during the Summer 2020 REU Inclusion program. The Fiddler Fellowship award is part of a $2 million-dollar endowment from Jerry Fiddler and Melissa Alden to the University of Illinois in support of student and faculty interdisciplinary research initiatives through the Illinois' Emerging Digital Research and Education in Arts Media (eDream) Institute at NCSA.

NCSA Letter of Recognition June 2020

- Letter of recognition awarded to student's showing outstanding contributions to research projects over the 2019-2020 academic year Students Pushing Innovation (SPIN) program

PROFESSIONAL EXPERIENCE

National Center for Supercomputing Applications (NCSA) Champaign, Illinois
Students Pushing Innovation (SPIN) Intern August 2019 – Present

- Participating in interdisciplinary research program bringing together 30+ students of multiple fields to collaborate on effective and interesting ways to apply computation and machine learning to problems
- Presenting research regarding machine learning applications in black hole mass estimations to several other undergraduate students and current NCSA researchers
- Attending 10+ SPIN workshops on new computing applications in science and a comprehensive tour of the Blue Waters supercomputer, which resulted in developing proficiency in machine learning python packages

National Science Foundation REU Fellow May 2020 – August 2020

- Collaborated with three researchers at NCSA's Advanced Visualization Laboratory in order to create an educational and artistic visualization of our research using Houdini
- Created presentations and talks of varying complexity for both general audiences and researchers in the field
- Optimized relevant scripts to run on the GPU cluster HAL at the NCSA Innovative Systems Lab

Galaxy and Black Hole Astrophysics Group Urbana, Illinois
Undergraduate Researcher February 2019 – Present

- Assisting Prof. Xin Liu and graduate student Joshua Yao-Yu Lin in machine learning applications to estimate cosmological redshift and active galactic nuclei supermassive black hole mass
- Matched and cleansed data from SDSS catalogs Stripe 82 and DR7, for a total of ~100,000 objects

- Acting as a group leader during meetings to discuss relevant literature, brainstorm new and effective architectures and methods of data engineering
- Assisting in data visualization, preprocessing, machine learning, paper writing, and work coordination within the group

Nuclear Physics Group Urbana, Illinois
Undergraduate Researcher June 2020 -- August 2020

- Investigated applications of quantum squeezing in quantum information science and quantum computation research
- Applied quantum mechanics principals in tandem with Mathematica computing software to investigate the dynamics of multiple-spin systems in magnetic fields
- Reverse-engineered Taylor expanded solutions of the dynamics with the goal of generalizing equations of motion for an arbitrary number of spins
- Compared independent theoretical predictions and calculations with historical research and literature in the field

Varsity Tutors, LLC Arlington Heights, Illinois
Math & Science Tutor May 2018 – August 2018

- Tutored seven students ages 13-28 in elementary to college level math and physics
- Used the Varsity Tutors online tutoring platform to develop comprehensive lesson plans and exercises to ensure thorough understanding of course material
- Tutoring services included preparatory lectures for upcoming classes and individual problem solving for students currently struggling to understand material

LEADERSHIP

Gamma Mu Chapter of Sigma Nu Fraternity Urbana, Illinois
Treasurer December 2018 – December 2019

- Managed over $50,000 in chapter finances and collected dues from 80+ active members
- Pioneered operational change in dues collection and an easily understandable budget format for other officers on the executive board to follow
- Coordinated with Sigma Nu Nationals to ensure financial literacy and awareness within our 80-man chapter
- Constructed committee meetings and events to ensure proper functioning as a governing body and organization

RELEVANT COURSE WORK

- Classical Mechanics I & II (Taylor)
- Electricity and Magnetism I & II (Griffiths)
- Quantum Mechanics I & II (Griffiths, Shankar)
- Statistical Mechanics (Kittel & Kroemer)
- General Relativity (Carroll)
- Modern Experimental Physics
- Multivariable Calculus
- Differential Equations
- Linear Algebra
- Applied Complex Variables
- Statistics and Probability
- Applied Statistics with R
- Stellar Astrophysics
- Cosmology (Sparke & Gallagher)

SKILLS

- Python (Pandas, NumPy, SciPy, AstroPy)
- Machine Learning (PyTorch, sklearn)
- RStudio
- Mathematica
- LaTeX
- Git