Surya Dutta

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Education

Yale University **May 2018** ***(Expected)***
Currently Pursuing B.S. in Physics *(Intensive)* | GPA: **3.8/4.0** New Haven, CT

Relevent Coursework: Physical Processes in Astronomy • Gravity, Astrophysics, & Cosmology
Classical Mechanics • Quantum Mechanics and Natural Phenomena
Modern Physics Laboratory

Fields of Interest: Astrophysics, Aerospace Engineering, Cosmology, Experimental Physics, Low-Temperature Physics

Yale University Likely Letter Recipient: Top 150 out of 31,000 applicants to Yale College

Experience

The Cryogenic Underground Observatory for Rare Events (CUORE) Experiment **Feb 2016 - Present**

Experimental Physics Research Assistant *with CUORE, a large multinational collaboration building a ton-scale underground detector for extremely rare nuclear events operated at 10 mK*

Student Researcher, **Maruyama Lab | Yale University**, New Haven, CT

Project: ***Monte Carlo Photon/Phonon Simulations for CUORE Upgrade with Particle Identification (CUPID)***

- Conducting research and development for next-generation of ton-scale cryogenic detectors
- Expanding current thermalization models for CUORE by improving mathematical models and design parameters
- Exploring optimality conditions and discrimination power to obtain stronger thermal signals and lower backgrounds
- Developing and analyzing Monte-Carlo simulations using the Geant4 and ROOT toolkits (based on C++)

On-Site Research Assistant *(May - Aug 2016)* | **Laboratorio Nazionali del Gran Sasso**, Assergi, Italy

- Conducted critical tasks on-site prior to commissioning and data acquisition, such as installing calibration hardware, diagnosing vacuum and cryogenic systems, assisting clean room operations, and setting up security networks
- Developed slow monitoring systems to accurately and securely monitor the cryostat using responsive LabVIEW virtual instruments, video streams, and a custom-built web interface using the Angular, Bootstrap, and MongoDB frameworks

The McKinsey Research Group **May 2015 - Aug 2015**

Visiting Student Researcher | Lawrence Berkeley National Laboratory, Berkeley, CA

Project: ***Monte Carlo Simulations for Dark Matter Particle Detection in Liquid Helium-4***

- Investigated the use of superfluid liquid helium-4 as a viable candidate for the detection of dark matter particles
- Developed Monte-Carlo simulations in Python to create optimality conditions for detecting dark matter using phonon energy kinematics, mathematical models, and probabilistic functions

Yale Undergraduate Research Association (YURA) **Jan 2015 - Present**

Founder and President | Yale University, New Haven, CT

- Founded 501(c)(3) non-profit student organization to establish community of 1500+ undergraduate researchers
- Lead 4 teams and 20 Executive Board members, oversee public initiatives, internal tasks, and intercollegiate networks

Skills

Programming : C++ (Scientific Programming) • LabVIEW • Python • Java

Software: Autodesk Inventor • Solidworks • Adobe Creative Suite

General: Research • Data Analysis • Experimental Physics • Monte Carlo Simulations • 3D Modeling
Leadership • Public Speaking • Website Development • Graphic Design • Filmmaking/VFX