

# NATIONAL INITIATIVE ON UNDERGRADUATE SCIENCE (NIUS)

The **National Initiative on Undergraduate Science (NIUS)**, a major initiative of **HBCSE (TIFR)** concerning tertiary science education in India, was launched in the summer of 2004. With thrust on promoting undergraduate research and learning, the NIUS programme has been contributing towards training of students and teachers in theoretical and experimental science, preparation of pedagogical material and R&D in science education/laboratory training. One of the key ideas of NIUS proto-research projects is to internalize general scientific skills and practices common across different disciplines through sustained mentoring, along with discipline specific content and conceptual enhancement, among undergraduate students. Along with Faculty members at HBCSE, researchers from leading scientific institutions like BARC, TIFR, ICT (Mumbai), IISERs, IIT (Mumbai), NCRA (Pune), PRL (Ahmedabad), University of Pune and motivated teachers from local colleges of Mumbai interact and guide students for NIUS proto-research projects. NIUS faculty at HBCSE have also assisted in setting up and conducting laboratories and framing curricula in the new science institutes (UM-DAE CBS, NISER and IISER Pune) in their formative years. Supporting college teachers to set up modest research programs at their own institutions is yet another important facet of the NIUS programme which further helps in mentoring undergraduate students at local levels.

## **NIUS Student Camps**

The current structure of the NIUS programme for students consists of an exposure cum enrichment camp followed by two to three camps for completion of project work. The main aim of the exposure cum enrichment camps is to excite undergraduate students about basic sciences. NIUS camps include sessions related to -a) frontier research areas in the discipline, b) core areas/concepts, c) laboratory activities involving planning and decision making, d) comprehension of scientific papers, and e) problems solving. At the end of the exposure camps, a certain number of students, depending on the availability of mentors, are selected for NIUS projects that continue for about three successive semesters or so.

# **National Initiative on Undergraduate Science (NIUS) PHYSICS**

## **Announcement of the 19th Batch (Year: 2022)**

NIUS (PHYSICS) is designed to provide extended mentoring and guidance to undergraduate students in various areas in Theoretical and Experimental Physics. Under the NIUS, selected students attend exposure and nurture camps organized by the Homi Bhabha Centre for Science Education (HBCSE) TIFR, Mumbai, and work on student projects during their vacations over a period of about one and half years (June 2022 – December 2023). Further information on the NIUS programme is available at <https://nius.hbcse.tifr.res.in/>

The first exposure and enrichment camp (19.1) will be held anytime between June to September 2022 or else in December 2022. This camp will be held in two parts. First part will be held in fully online mode on Zoom platform and the second part will be held in offline/in-person at HBCSE, Mumbai (in accordance with the HBCSE office orders and COVID-19 guidelines). Every selected student is expected to attend both the parts of the camp. The first camp will be an introductory camp where leading scientists will offer short courses (online) on core topics in physics. There will also be a 30-hour offline laboratory course based on the “Experimental Problem Solving”. In addition, there will be project related and enrichment lectures (online + offline). The students selected after the first camp will carry out project work under the supervision of their preferred mentor during the subsequent camps.

# National Initiative on Undergraduate Science (NIUS) Astronomy

## Announcement for 2022 programme

The NIUS programme organized by the Homi Bhabha Centre for Science Education (HBCSE-TIFR), Mumbai is designed to provide extended mentoring and guidance to undergraduate students in various areas of science. Till last year the Physics component of NIUS included Astronomy and Astrophysics as well. This year the NIUS (Astronomy) programme will be held separately. The announcement for the Physics programme is available separately (<https://nius.hbcse.tifr.res.in/announcements/national-initiative-on-undergraduate-science-nius-physics/>).

The broad structure of the NIUS (Astronomy) programme will be similar to other subjects in NIUS (<https://nius.hbcse.tifr.res.in>). All selected students will attend an exposure and enrichment camp to be held sometime between June to September 2022 or else in December 2022 (final dates to be announced by end-April). This camp will include lectures aimed to introduce students to a wide variety of areas of current research in astronomy and astrophysics. In addition, the camp will include interactive sessions in the form of mini-workshops to provide glimpses of the techniques and tools of research in astrophysics, using real or simulated data. This camp will be held in two parts. The first part will be held online and the second part will be held in onsite/in-person. The venue of the onsite component is likely to be a major astrophysics research institute in India. Every selected student is expected to attend both the parts of the camp.

The enrichment camp will be followed by an extended nurture programme for a smaller subset of students in the form of long-term projects in different research institutions across the country. These students will be required to visit their respective mentors' institutions during vacation periods over the next 1.5 years to carry out the projects. A final report at the end of two years will mark the successful completion of the NIUS project.

# SELECTED STUDENTS



AGNIDEEP CHAKRABORTY

Roll No.- 106

Selected for NIUS (PHYSICS)



DEBANUJAN NATH

Roll No.- 143

Selected for NIUS (PHYSICS)



**SOMDATTA BASU**

**Roll No.- 171**

**Selected for NIUS (ASTRONOMY)**