AS105: ***Journey through the stars: Observational projects at the observatory (2 weeks)***

(A certificate course for UG and PG students)

Instructors: *D. Bisht, K. Belwal, M. Bisht, S. Biswas*

Mode of Instruction*: English/Bengali*

Syllabus

Introduction to Optical Astronomy and Observation Techniques ***(Week 1)***

Instructor: D. Bisht, K. Belwal, D. Bhowmick, S. Biswas

Orientation: Introduction to the internship program, overview of facilities at IERCOO Campus, ICSP and future possibilities; **Basics of astronomy**: introduction to fundamental astronomical concepts (e.g., celestial coordinate systems, stellar magnitudes, spectral classification), overview of telescopes and its use; **Observational techniques:** introduction to observational methods and instrumentation, including CCD cameras and spectrographs, hands-on experience with telescope operation and data collection techniques; **Observation strategy:** Guidance on target selection and observational planning, Night-time observing sessions to apply learned techniques; **Tools and method for data analysis;** introduction to data analysis software tools commonly used in optical astronomy, basic data processing techniques, including calibration.

CCD Data Analysis and Report Writing ***(Week 2)***

Instructor: D. Bisht, M. Bisht, S. Biswas, K. Belwal

Project execution: Students undertake their assigned projects under the supervision of mentors, Data analysis, interpretation, and writing project reports; **Project presentation and wrap-up:** Students present their project findings/Understanding, Feedback and discussion on project outcomes, ALL students must submit a project report before Certificate is distributed; **Software training:** Mentors will provide training on data reduction and analysis using software tools such as PYTHON, IRAF, DAOPHOT, CLOUDY, TOPCAT, GNUPLOT, etc.