Title: Constraining the Nature of Multi-messenger Transients with Co-ordinated Multi-wavelength Observations (CoNMuTraMO)

Aims and objectives: The goal of this project is to harness existing optical, radio and X-ray facilities available to the five BRICS (**B**razil, **R**ussia, **I**ndia, **C**hina, **S**outh Africa) countries to perform co-ordinated follow-up and monitoring of multi-messenger (MM) transients. The science case for the project will focus on the observation of short-lived high-energy transients such as Fast Radio Bursts (FRBs), Gamma-ray Bursts (GRBs) and the follow-up of neutrino and gravitational wave (GW) MM events. In particular, the project aims to utilise a global multi-wavelength (MWL) observational network to support the ongoing O4 run of LIGO-VIRGO-KAGRA (LVK) GW observatories. The BRICS-wide coordinated ground and space-based MWL observations of astronomical transients will help identify novel kinds of transients and probe the underlying physical mechanisms and the progenitors giving rise to them.

The unique BRICS-wide network will cover the electromagnetic spectrum, from radio to gamma-rays, and a global range of latitudes and longitudes, thus providing complete sky and temporal coverage for follow-up and monitoring. With the diverse and large datasets collected through BRICS MWL observing facilities, robust and efficient data analysis pipelines and software will be developed utilising high-performance computing resources. Machine Learning (ML) and Artificial Intelligence (AI) algorithms will be used to explore the transient space/surveys.

Funding agency: Department of Science and Technology, International Co-operation Division, BRICS consortium.

Number of JRF positions: Two (2)

For any queries related to the project, kindly contact the Project Investigator, Dr. (Ms) Kuntal Misra (kuntal@aries.res.in).