School of Physical Sciences Seminar

Date: Thursday 23rd March at 1pm in N115 (Marconi Building).

Light lunch available from 12.45pm

Speaker: Dr. Masha Chernyakova, DCU School of Physical Sciences

Title: Extreme accelerators on the high energy sky.

Abstract: Modern telescopes have revealed the presence of celestial sources able to accelerate particles to very high energies in an extremely efficient way. In my talk, I will briefly review the status of the field and discuss in detail two different examples of such objects - gamma-ray binaries, and HESS J1702-420, a multi-TeV source with an unusual energy-dependent morphology detected up to very high energies with no spectral cut-off.

Gamma-ray binaries are a subclass of high-mass binary systems whose energy spectrum peaks at high energies (MeV–GeV energy range) and extends to very high energy (GeV–TeV) gamma-rays. In these systems, a compact object is orbiting around a young, massive, either O- or B-type star, and the interaction between the pulsar wind and the stellar outflow leads to the observed multi-wavelength emission with lots of unusual properties.

Emission from HESS J1702-420 is well described by a combination of point-like and diffuse sources. In my talk, I will show that both sources can be a result of the emission coming from a proton accelerator embedded into a dense molecular cloud.