# Machine Learning for Space Plasma and Space Weather Applications

Main Supervisor: Dr Enrico Camporeale
More information: https://www.qmul.ac.uk/spcs/astro/teaching/phd-programme/

Space weather refers to the changing plasma conditions in near-Earth space that can have a range of impacts on our modern society. The solar wind is highly structured, and when this meets the Earth's magnetic field, disturbances can lead to a chain of events that have an impact on our technology infrastructure, including power grid blackouts, satellite damage and increased risk of satellite collisions, increased radiation on polar flights. None of these events can be reliably forecast at the moment and our group is actively working on developing machine learning-based forecasting models.

A related area of research that can be addressed in this project is the problem of sub-grid closure in collisionless plasma modeling, that is the inability of large-scale simulations to consistently capture small-scale (kinetic) features. Promising results have been shown in the context of neutral fluid turbulence, and we are actively investigating the use of machine learning to tackle this problem in space plasmas.

The applicant should have a strong background in machine learning algorithms and software (phyton libraries) and be familiar with space plasmas and/or space weather phenomenology. The project will be supervised by Dr. Enrico Camporeale.

Eligibility: The normal minimum entry requirement is an upper second class honours degree in Physics, Astronomy or Astrophysics, Mathematics, or in a subject with substantial physics and/or mathematics content. Please note that only UK home students are eligible for this scholarship.

To apply: https://www.qmul.ac.uk/postgraduate/research/subjects/astronomy.html

Applications received by April 30th will receive full consideration.