Exploring Mars with the ExoMars Trace Gas Orbiter mission

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Description: This project provides the opportunity to be directly involved in the ESA ExoMars Trace Gas Orbiter mission, which is currently in orbit around Mars.

The project will involve working on:

- Understanding the behaviour of the NOMAD spectrometer during its journey to Mars
- Exploitation of data from the NOMAD instrument to derive abundances of trace gases and dust/cloud aerosols in the atmosphere of Mars
- Preparation of novel new techniques for the retrieval of atmospheric species
- Analysis of large datasets returned from the ExoMars mission

This mission is aimed at furthering our understanding of the composition and dynamics of the martian environment, through the measurement of trace gases such as ozone and methane in the martian atmosphere from orbit. The project relates to the UVIS channel of the NOMAD instrument; UVIS is an optical spectrometer led by the Open University to measure solar radiation travelling through the martian atmosphere at UV and visible wavelengths, in order to detect and map the presence of ozone, dust and ice clouds in the atmosphere of Mars in unprecedented detail.

This project will involve scope for a wide range of potential research from instrument testing through to exploitation of real spaceflight instrument data. The focus of the project is on the retrieval of ozone and aerosol abundance and properties from spectra that will be returned from the UVIS instrument. The student will work within a highly specialist spaceflight team and interact with European collaborators and the European Space Agency.

The modelling studies undertaken may also be conducted in partnership with collaborators based in France and USA, presenting the opportunity for data exploitation from existing ESA and NASA Mars missions currently in operation. This studentship will form a key part of the international ESA effort currently being undertaken for the ExoMars Trace Gas Orbiter mission, and will play a major role in the success of the NOMAD instrument.

Qualifications required: A first class or upper second class degree in Physics or related discipline