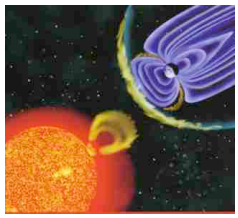
Course: **Space Physics**

Lecturer: Dr. Ingo Mueller-Wodarg
Office: Huxley Building, 720b
Email: i.mueller-wodarg@imperial.ac.uk



Structure:

The Space Physics course will consist of 26 lectures in Term 2 and 1 revision lecture. Topics addressed are (1) The Sun, (2) The Solar Wind, (3) Magnetospheres and Atmospheres and (4) Coupling between the Solar Wind, Magnetospheres and Atmospheres. Course material presented in the lectures will also be made available for download on Blackboard. You will receive Handouts and Problem Sheet to accompany the lectures and help deepen your understanding of the material.

Aims:

Aim of this course is to convey an understanding of physical processes that control the flow and distribution of energy and material (mostly plasma) in the solar system, from the Sun and solar wind to bodies including planets, moons and comets.

Objectives:

By the end of the course the student should:

- Be familiar with the key processes determining the release of energy and material from the solar corona into space
- Know the physical processes that control the interaction of planets, moons and comets with the solar wind
- Understand the structure and composition of atmospheres and magnetospheres throughout the solar system and beyond (including Exoplanets), and of the processes that cause these properties.
- Understand how planetary atmospheres respond to solar/stellar forcing

Pre-requisits:

Previous attendance of the Plasma Physics course is highly recommended. Calculations carried out in the lectures require a good knowledge of Maxwell's Equations and their application to Space Plasmas. Though not recommended, students have in the past successfully attended in parallel (during the same term) the Space Physics & Plasma courses, but this requires extra initiative by the student to independently learn the required background Plasma Physics.

Recommended reading:

No single textbook will cover all course material, but the following provide good background reading to much of the material. Both are available in the library, the second also as an e-book from the library web site.

1. Physics of Solar System Plasmas, by Thomas E. Cravens, Cambridge University Press Atmospheric and Space Science Series, ISBN: 9780521352802, 1997 (https://unicorn.lib.ic.ac.uk/uhtbin/ckey/67161)
2. Ionospheres, by Robert W. Schunk and Andrew F. Nagy, Cambridge University Press Atmospheric and Space Science Series, ISBN: 9780521607704, 2004/2009 (http://tinyurl.com/bntz99q)