PHY 241 Planetary Systems (Semester A 2010)

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The Module

Ever since the dawn of civilisation human beings have charted the paths of the planets across the night sky and speculated about their nature. Indeed the word planet has its origin in the ancient Greek term 'planete' - meaning wanderer. Used in its modern scientific context the word planet refers to an object which orbits about a star, but which itself is not a star. Planets have a special philosophical significance since they are the bodies on which life itself is expected to come into existence. This module provides an in depth description of our current knowledge and understanding of the planets in our Solar System, and of the planetary systems now known to orbit around stars other than the Sun - the extrasolar planets. The properties of individual planets and their satellites will be described and contrasted, and basic physical principles will be used to explain their orbits and physical features. Our understanding of how planetary systems form will be explored, and current scientific ideas about the origin of life will be discussed.

Lectures & Attendance

There are three lectures a week. They will be in Physics 208 on Monday 2-3pm, 3-4pm and in Physics 609 Tuesday 12-1pm. Lectures will start at five minutes past the hour and end at five minutes to the next.

Attendance at lectures is compulsory; an attendance sheet is circulated and an attendance record kept. Make sure that you sign this sheet: you will be deemed not to have attended if you do not. *It is a disciplinary offence to sign on behalf of anyone else or to get others to sign for you.*

Reference Texts

Main Texts

Moons and Planets (5th Ed.), William K. Hartmann (Wadsworth Publishing).
Physical Processes in the Solar System, by John D. Landstreet (Keenan & Darlington Publishers).
An Introduction to Modern Astrophysics, by Bradley W. Carroll and Dale A. Ostlie (Pearson / Addison Wesly Publishing). - look at the 2nd edition for up to date planetary coverage.

Supplementary Texts

Physics and Chemistry of the Solar System (2nd Ed.), by J. S. Lewis (Elsevier Academic Press).
Planetary Sciences by Imke dePater & Jack Lissauer (Cambridge University Press)
The New Solar System (4th Ed.), by J. Kelly Beatty, Carolyn Collins Petersen, Andrew Chaikin (Cambridge Univ. Press/Sky Publishers).
The Solar System, by N. McBride and Ian Gilmour (Open University/Cambridge University Press).
Astronomy & Astrophysics by Zeilik, Gregory, & Smith (Saunders College Publishing)

Assessment

The final mark for the module will consist of the following weighted factors: 80% 2-1/4 hour Exam, 20% coursework (10% Assignments and 10% Mid-term Exam - nominally in Week 8, after the reading week)

Assignments

Assignments will be handed out at various times during the module. Hand-out and Hand-in times are given on each assignment sheet. Students will have 1-week to complete and hand in their solutions to the assignment questions. The format of these exercises will loosely reflect that of the examination, consisting of both basic and challenging problems. These will also be posted on the web.

Late scripts will not be accepted or marked unless there is a good and substantiated reason for the delay.

You are encouraged to work together on these exercises: scientific research is often conducted by discussion amongst colleagues. The work you hand in, however, must be your own, (i.e. you should be able to reproduce it at the chalkboard if asked to do so).

Be sure to cite any texts or outside sources of information used (e.g. web sites).

Minimum Requirements for Module Completion

The Department keeps an attendance record for all modules. You may miss no more than one lecture, without prior permission or a subsequent acceptable written explanation. You must also hand in a genuine attempt at all the exercise assignments. If you do not meet these requirements, you are liable to be de-registered from the module: any de-registration is displayed on the transcript of modules eventually supplied by the College. If you are in danger of de-registration, you will receive one e-mail warning. [Note: e-mail is an official means of communication for this and all other aspects of the module; you must access your e-mail regularly.]

If you have a genuine and acceptable reason for absence, or for not handing in an assignment, you may register this via an absence notification form (on the dept. web page) or you may contact the Senior Tutor directly.

Questions & Concerns

If you have any questions or concerns with any aspects of the module, please feel free to contact me either after the lectures, during office hours, or at some mutually convenient time in my office.

Other Information

Planetary science is a relatively young and fast-moving area of science. A good way to keep up with recent breakthroughs is via popular science coverage on the web. There are several sites that specialize in astrophysical and planetary news. Check the module website for recent ones.

Students are also encouraged to attend the Astronomy Unit seminars, which take place in the Mathematics Seminar Room at 2:30pm on most Fridays during the term. Some of the seminars are on topics related to those covered in the module.

On the second Friday of each month from October to April, the Royal Astronomical Society (RAS) organises meetings, which take place at Burlington House in Piccadilly and in the Scientific Societies Lecture Theatre. Some of these meetings are open to the public and could be of interest to students.