

# PX279-7.5 The Solar System

**20/21**

**Department**

Physics

**Level**

Undergraduate Level 2

**Module leader**

Peter Wheatley

**Credit value**

7.5

**Module duration**

10 weeks

**Assessment**

100% exam

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

The study of the Solar System has been one of the most important in the history of physics. Newton developed his theory of gravitation to explain Kepler's observations of the Solar System planets and effectively established what we now call the scientific method. Arguments and claims about the Solar System have had ramifications beyond science - for example Galileo was convicted of heresy for arguing that the earth moved round the Sun.

In this module, we will introduce some of the intriguing phenomena observed in our Solar System. Questions we will touch on include: How does the Sun work? How do planets move and form? Do they have atmospheres? While the answers to some of these questions are complicated and still not completely known, we will construct convincing, qualitatively correct and appealing explanations of many of these phenomena using physics studied in the first year.

[Module web page](#)

### Module aims

To explain features of the Solar System.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Kepler's laws, Newtonian mechanics and gravity in the Solar System.

The Earth-Moon-Sun system, i.e. eclipses, phases of the Moon, tides, the formation of the Moon.

The Sun as a star. Physical structure of the interior, the solar surface (photosphere) and other atmospheres (chromosphere and corona). The solar cycle, sun spots, solar flares and the solar wind.

Solar-terrestrial effects. The magnetosphere and magneto-trail and Van Allen's belts. The effect of solar storms on the Earth's atmosphere, aurorae etc. Astronomical cycles affecting climate.

The planets. Internal structures, atmospheres, evolution of the atmospheres. Energy balance, the greenhouse effect, conditions for life. Earth, Venus and Mars' atmospheres compared.

Planetary satellites, rings, minor bodies of the Solar System (asteroids and comets).

The formation and evolution of the Solar System. Comparison with exo-planetary systems.

## **Learning outcomes**

By the end of the module, students should be able to:

- Solve problems relating to the orbital motion of Solar System objects.
- Compare the physical and atmospheric structures of the different Solar System objects and how they were formed.
- Explain elementary solar physics

## **Indicative reading list**

Jones, Discovering the Solar System, 2nd Edition

[View reading list on Talis Aspire](#)

## **Subject specific skills**

Knowledge of mathematics and physics. Skills in modelling, reasoning, thinking.

## **Transferable skills**

Analytical, communication, problem-solving, self-study

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## **Study**

## **Study time**

Type	Required
Lectures	20 sessions of 1 hour (27%)
Private study	55 hours (73%)
Total	75 hours

## Private study description

Working through lecture notes, solving problems, revising for exams, practising on past exam papers

## Costs

No further costs have been identified for this module.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group B1

	Weighting	Study time	Eligible for self-certification
<b>Assessment component</b>			
In-person Examination 2 compulsory questions	100%		No

Reassessment component is the same

## Feedback on assessment

Meeting with personal tutors, group feedback

[Past exam papers for PX279](#)

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## Availability

## Courses

This module is Option list A for:

- Year 2 of UPXA-GF13 Undergraduate Mathematics and Physics (BSc)
- UPXA-FG31 Undergraduate Mathematics and Physics (MMathPhys)
  - Year 2 of GF13 Mathematics and Physics
  - Year 2 of FG31 Mathematics and Physics (MMathPhys)
- Year 2 of UPXA-F300 Undergraduate Physics (BSc)
- UPXA-F303 Undergraduate Physics (MPhys)
  - Year 2 of F300 Physics
  - Year 2 of F303 Physics (MPhys)