

Basic details

|  |   |                 |  |                                       |
|--|---|-----------------|--|---------------------------------------|
| UID  | <input type="text"/>  | Cohorts covered | Earliest cohort<br>2020-21                             | Latest cohort<br><input type="text"/> |
| Long title   | <input type="text" value="Suns, Stars and Planets"/>  |                 |  |                                       |
| New code   | <input type="text" value="PHYS50006"/>  | New short title | <input type="text" value="Suns, Stars &amp; Planets"/> |                                       |
| Brief description of module<br><i>(approx. 600 chars.)</i> | <input type="text" value="By studying this module, students will become familiar with the structure and evolution of the Sun and other stars. Students will also learn about the key physical principles that determine the current state of the planets in our own Solar System, and that allow us to detect and begin to characterise planets in other star systems."/> |                 |  |                                       |
|  | 333 characters  |                 |  |                                       |
| Available as a standalone module/ short course?            | <input type="text" value="N"/>  |                 |  |                                       |

Statutory details

|              |  |   |  |             |                      |
|--------------|--|---|--|-------------|----------------------|
| Credit value | ECTS<br><input type="text" value="5"/> | CATS<br><input type="text" value="10"/> | Non-credit<br><input type="text" value="N"/> | HECOS codes | <input type="text"/> |
| FHEQ level   | <input type="text" value="5"/>         |   |  |             | <input type="text"/> |
|              |  |   |  |             | <input type="text"/> |
|              |  |   |  |             | <input type="text"/> |

Allocation of study hours

|                   | Hours                              |   |
|-------------------|------------------------------------|---|
| Lectures          | <input type="text" value="22"/>    |   |
| Group teaching    | <input type="text" value="0"/>     | <i>Incl. seminars, tutorials, problem classes.</i>  |
| Lab/ practical    | <input type="text" value="0"/>     |   |
| Other scheduled   | <input type="text" value="11"/>    | <i>Incl. project supervision, fieldwork, external visits.</i>                               |
| Independent study | <input type="text" value="92"/>    | <i>Incl. wider reading/ practice, follow-up work, completion of assessments, revisions.</i> |
| Placement         | <input type="text" value="0"/>     | <i>Incl. work-based learning and study that occurs overseas.</i>                            |
| Total hours       | <input type="text" value="125"/>   |   |
| ECTS ratio        | <input type="text" value="25.00"/> |   |

Project/placement activity

Is placement activity allowed?

Module delivery

|               |   |       |                                     |
|---------------|---|-------|-------------------------------------|
| Delivery mode | <input type="text" value="Taught/ Campus"/> | Other | <input type="text"/>                |
| Delivery term | <input type="text"/>                        | Other | <input type="text" value="Term 3"/> |

Ownership

Primary department

Additional teaching departments **None**

Delivery campus **South Kensington**

### Collaborative delivery

Collaborative delivery? **N**

External institution **N/A**  
 External department **N/A**  
 External campus **N/A**

### Associated staff

| Role          | CID | Given name | Surname   |
|---------------|-----|------------|-----------|
| Module Leader |     | Yvonne     | Unruh     |
| Topic Leader  |     | Juliet     | Pickering |
|               |     |            |           |
|               |     |            |           |
|               |     |            |           |
|               |     |            |           |
|               |     |            |           |
|               |     |            |           |
|               |     |            |           |

### Learning and teaching

#### Module description

|                   |  |
|-------------------|--|
| Learning outcomes | <p>On completion of this module you will be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate familiarity with the stellar structure equations and explain the physical concepts underpinning them</li> <li>• Derive scaling relations from the stellar structure equations</li> <li>• Discuss how the derived scalings compare to observed relations for main-sequence stars</li> <li>• Describe the characteristics of the internal structure as well as the outer layers of the Sun</li> <li>• Describe the current state of planets and smaller bodies in our own Solar System, including internal structure, atmospheric structure and surface temperature.</li> <li>• Demonstrate an appreciation of the wide range of physics and chemistry that determines the current state of planetary and small body surfaces.</li> <li>• Describe the methods used to detect planets around other stars, including the limitations and selection effects inherent in these methods</li> </ul>   |
| Module content    | <ul style="list-style-type: none"> <li>• Stellar Structure: stellar structure equations, energy generation and transport; hydrostatic equilibrium; the Schwarzschild convective stability criterion.</li> <li>• Scaling laws resulting from the stellar-structure equations as applied to main-sequence stars; comparisons to observed scaling relations; the role of mass in determining stellar characteristics</li> <li>• Sun: Internal structure and outer layers (atmosphere); the Sun in context</li> <li>• Stars: Life-cycle basics; the Hertzsprung-Russell diagram; Concepts of magnitude, parallax and proper motion in stellar astronomy</li> <li>• Planets and smaller bodies in our own Solar System: internal structure, atmospheric structure and surface temperature; prediction of surface temperatures for objects without atmospheres; Kepler's laws of planetary motion; Methods used to detect planets around other stars, including the limitations and selection effects inherent in these methods; Exoplanets; Current state of the search for life elsewhere in the universe</li> </ul> |

|                                |  |
|--------------------------------|--|
| Learning and Teaching Approach | Students will be taught using a combination of lectures, office hours, and directed exercises on theoretical work  |
| Assessment Strategy            | A written exam (2h) in term 3 covering all learning outcomes will comprise the summative assessment and will contribute 100% of the module mark. The exam will test competences in any of the listed learning outcomes.  |
| Feedback                       | General feedback on written examinations for each module is provided in the form of written reports from the examiners for the students.   |
| Reading list                   | <p>Self-contained lecture notes are provided to the students, so there is no text book required for this module. For students wishing to explore the topic further, a range of (fully optional) textbooks are listed as suitable sources. These include</p> <ul style="list-style-type: none"> <li>•Principles of Astrophysics, by Charles R. Keeton, Springer</li> <li>•The Stars: their structure and evolution, by Roger J. Taylor, CUP, 2nd edition</li> <li>•An Introduction to the Sun and Stars, Simon F. Green &amp; Mark H. Jones (eds), CUP</li> <li>•Planets &amp; Planetary Systems, by Stephen Eales, Wiley-Blackwell</li> <li>•Transiting Exoplanets, by Carole Haswell, CUP</li> <li>•Exploring the Solar System, by Peter Bond, Wiley-Blackwell</li> <li>•An Introduction to the Solar System, David A. Rothery, Neil McBride &amp; Iain Gilmour (eds), CUP</li> <li>•An Introduction to Astrobiology, David A. Rothery, Iain Gilmour &amp; Mark Sephton (eds), CUP</li> </ul> |

### Quality assurance

### Office use only

Date of first approval

Date of last revision

Date of this approval

QA Lead

Department staff

Date of collection

Module leader

Date exported

Date imported

Notes/ comments

# Programme structure

## Associated modules

| UID | Legacy code | Module title | Requisite type |
|-----|-------------|--------------|----------------|
|-----|-------------|--------------|----------------|



UID

Legacy code

Module title

Requisite type



## Assessment details

|                |         |           |     |
|----------------|---------|-----------|-----|
| Grading method | Numeric | Pass mark | 40% |
|----------------|---------|-----------|-----|

## Assessments

| Assessment type | Assessment description | Weighting | Pass mark | Must pass? |
|-----------------|------------------------|-----------|-----------|------------|
| Examination     | 2-hour exam            | 100%      |           | Y          |

100%