



## Programme Specification (PG)

|                                             |                                                     |
|---------------------------------------------|-----------------------------------------------------|
| Awarding body / institution:                | Queen Mary University of London                     |
| Teaching institution:                       | Queen Mary University of London                     |
| Name of final award and title:              | MSc Astrophysics, PGCert Astronomy and Astrophysics |
| Name of interim award(s):                   | PGCert Astrophysics                                 |
| Duration of study / period of registration: | 1 Year FT, 2 Years PT                               |
| Queen Mary programme code(s):               | F5S1, F5S2 and FSEG                                 |
| QAA Benchmark Group:                        |                                                     |
| FHEQ Level of Award:                        | Level 7                                             |
| Programme accredited by:                    | N/A                                                 |
| Date Programme Specification approved:      |                                                     |
| Responsible School / Institute:             | School of Physical and Chemical Sciences            |

Schools / Institutes which will also be involved in teaching part of the programme:

School of Mathematical Sciences

Collaborative institution(s) / organisation(s) involved in delivering the programme:

N/A

### Programme outline

The MSc Astrophysics is a one year FT or two year PT course that is unique in the UK in the scope of material covered. It consists of eight taught modules and a project which gives students a detailed overview of the fundamentals of the subject as well as an up-to-date account of recent developments in research. The wide range of topics covered by the course reflects the breadth of research interests pursued by the members of staff in our large and friendly research group. Lectures cover such diverse topics as the origin of the universe, dark matter, dark energy, galaxies, radiation mechanisms in astrophysics, the life and death of stars, black holes, extrasolar planets, the solar system, space and solar plasma physics and research methods. Students also write a dissertation on a project on an astrophysical topic of a theoretical, computational or observational nature.

### Aims of the programme

- 1) To provide an understanding of a wide range of fields in astronomy and astrophysics and to give students a detailed overview of the fundamentals of the subject as well as knowledge of the most recent research results.
- 2) To provide an opportunity for graduates in a subject with substantial mathematical or physical content to pursue their

interest in astronomy, which leads to a formal postgraduate qualification in the subject.

3) To provide a starting point for a research career in astronomy, astrophysics or cosmology, both within the University and elsewhere.

4) To provide an understanding of the contemporary research in an area in astrophysics through completion of an extended project under the guidance of a supervisor at the forefront of research in the relevant subject area.

5) To provide students with a friendly and supportive environment in which to enrich their learning experience through interaction with active research staff and other students.

### What will you be expected to achieve?

Students successfully completing the programme will be able to:

#### Academic Content:

|     |                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------|
| A 1 | Demonstrate an advanced understanding of theories and ideas in a number of astrophysical topics. |
| A 2 | Communicate complex scientific ideas, concisely, accurately and informatively.                   |
| A 3 | Manage their own research, making use of journal articles and other primary sources.             |

#### Disciplinary Skills - able to:

|     |                                                                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B 1 | Plan and execute an investigation and critically analyse the results, drawing valid conclusions.                                                                   |
| B 2 | Learn to carry out original work as well as independent work.                                                                                                      |
| B 3 | Develop and demonstrate, through the preparation of their project in writing, an ability to assimilate and understand a topic of current research in astrophysics. |

#### Attributes:

|     |                                                            |
|-----|------------------------------------------------------------|
| C 1 | Acquire and apply knowledge in a rigorous way.             |
| C 2 | Explain and argue clearly and concisely.                   |
| C 3 | Connect ideas and information within their field of study. |

|    |                                                                          |
|----|--------------------------------------------------------------------------|
| C4 | Critically evaluate the reliability of different sources of information. |
|----|--------------------------------------------------------------------------|

## How will you learn?

Modules are taught as appropriate for the content. Those teaching the theoretical underpinnings of the subject have a minimum of 33 contact hours per week, for 11 weeks, and combine lecture-style delivery and tutorial segments. Those teaching hands on skills consist of a variety of interactive sessions and/or computer lab-based sessions. The research project involves regular meetings with the supervisor.

## How will you be assessed?

Taught modules on the MSc are assessed by 90% final exam and 10% coursework, with the exception of Galaxies (SPA7039P) which has a 80%, 20% split, and Research methods (SPC721P), Practical Astrophysics (SPA7038P), Deep Learning (SPA7037P), Topics in Scientific Computing (MTH739), Programming in Python (MTH766), and AI in Astrophysics and Space Science (SPC722), which are 100% coursework.

The 60 credit project is core and is weighted as 100% dissertation and should be roughly 10,000 words.

## How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

FSSJ Full-Time MSc Astrophysics:

Students take eight modules (each of 15 credits) from the compulsory modules and the list of electives taught modules, and the project/dissertation during semesters 1 -3.

F5S2 Part-Time MSc Astrophysics:

Over the two years, students take eight modules (each of 15 credits) from the compulsory modules and the list of electives taught modules. Students take the project/dissertation in the second year.

Students can choose to take the taught modules in any order, but they should take 2 in semester 1 and two in semester 2 for both years.

F53G Postgraduate Certificate in Astrophysics:

Students should be offered the list of elective taught modules and should register for 60 credits, to be completed in one academic year. PGCert students do not normally take the module "Research Methods".

(For all programmes) The choice of electives has to be agreed by the Programme Director, taking into account the past academic record of student.

| Module Title                               | Module Code | Credits | Level | Module Selection Status | Academic Year of Study | Semester        |
|--------------------------------------------|-------------|---------|-------|-------------------------|------------------------|-----------------|
| Astrophysical Plasmas                      | SPA7004P    | 15      | 7     | Elective                | 1                      | Semester 2      |
| Extrasolar Planets and Astrophysical Discs | SPA7009P    | 15      | 7     | Elective                | 1                      | Semester 2      |
| Stellar Structure and Evolution            | SPA7023P    | 15      | 7     | Elective                | 1                      | Semester 1      |
| MSC ASTROPHYSICS RESEARCH PROJECT          | SPA7000P    | 15      | 7     | Core                    | 1                      | Semesters 2 & 3 |
| Galaxies                                   | SPA7039P    | 15      | 7     | Elective                | 1                      | Semester 2      |
| Relativity and Gravitation                 | SPA7019P    | 15      | 7     | Elective                | 1                      | Semester 1      |
| Research Methods                           | SPC721P     | 15      | 7     | Compulsory              | 1                      | Semester 1      |
| Radiative Transfer and Astrochemistry      | SPA7036P    | 15      | 7     | Elective                | 1                      | Semester 1      |
| Advanced Cosmology                         | SPA7028P    | 15      | 7     | Elective                | 1                      | Semester 1      |
| Deep Learning                              | SPA7037P    | 15      | 7     | Elective                | 1                      | Semester 2      |
| Practical Astrophysics                     | SPA7038P    | 15      | 7     | Elective                | 1                      | Semester 2      |
| Relativistic Waves and Quantum Fields      | SPA7018     | 15      | 7     | Elective                | 1                      | Semester 1      |
| AI in Astrophysics and Space Science       | SPC722      | 15      | 7     | Elective                | 1                      | Semester 2      |
| Topics in Scientific Computing             | MTH739      | 15      | 7     | Elective                | 1                      | Semester 1      |
| Programming in Python                      | MTH766      | 15      | 7     | Elective                | 1                      | Semester 1      |

## What are the entry requirements?

Students wishing to take the MSc Astrophysics should normally have a first- or second-class honours degree (or equivalent) in a subject with substantial Physics, Mathematics and/or Astronomy content. Students who do not qualify may wish to take the Postgraduate Certificate in Astronomy and Astrophysics (the first year of the MSc Astrophysics programme) which normally requires a pass degree (or equivalent) in a subject with a substantial Physics, Mathematics and/or Astronomy content. Students who do sufficiently well in the Postgraduate Certificate examinations may be allowed to change their registration to

the Part-Time MSc Astrophysics and move into its second year.

### **How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?**

The Student Voice Committee provides a formal means of communication and discussion between Schools and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. The Student Voice Committee meet regularly throughout the year.

Each school operates an Education Committee, or equivalent, which advises the School/Institute Director of Education on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools operate an Annual Programme Review of their taught undergraduate and postgraduate provision. The process is normally organised at a School-level basis with the Head of School, or equivalent, responsible for the completion of the school's Annual Programme Reviews. Schools/institutes are required to produce a separate Annual Programme Review for undergraduate programmes and for postgraduate taught programmes using the relevant Undergraduate or Postgraduate Annual Programme Review pro-forma. Students' views are considered in this process through analysis of the NSS and module evaluations.

### **What academic support is available?**

The programme director acts as academic advisor to the students and they are also allocated a project supervisor, based on their research interests. During the project regular supervision meetings are expected.

### **Programme-specific rules and facts**

As part of the Academic regulations the following special regulation applies for the MSc Astrophysics:

Condoned failure

6.40 The examination board may condone failure in the taught component of modules up to a maximum value of 30 credits, where:

- i. A student achieves a module mark of 0.0 or higher; and,
- ii. The student achieves an average mark of 50.0 or higher across all modules.

### **How inclusive is the programme for all students, including those with disabilities?**

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)

- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

### Links with employers, placement opportunities and transferable skills

The School has a dedicated SEPnet Employer Engagement Officer who provides links between students and industry, arranging work placement opportunities.

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## Programme Specification Approval

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**Person completing Programme Specification:**

Timothy Clifton

**Person responsible for management of programme:**

Timothy Clifton

**Date Programme Specification produced / amended by School / Institute Education Committee:**

23 Jun 2025

**Date Programme Specification approved by Taught Programmes Board:**