Programme Specification Document

Approved, 2022.04

Overview

Programme Code	35543
Programme Title	Observational Astrophysics
Awarding Institution	Liverpool John Moores University
Programme Type	Masters
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	Matthew Darnley
Link Tutor(s)	

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Science - MS	See Learning Outcomes Below
Alternative Exit	Postgraduate Diploma - PD	For the award of PG Diploma, students will be able to demonstrate familiarity with the chronology and physical mechanisms underlying the formation and evolution of the principal structures in the Universe, on all scales from planets to galaxy superclusters. They will be able to discuss the strengths and weaknesses of different types of observational methods, across the full electromagnetic spectrum and including non-em radiation, for determining important physical properties. In addition, students will have a sufficiently detailed knowledge of chosen specialist areas that they can critically evaluate new findings in the refereed research literature.
Alternative Exit	Postgraduate Certificate - PC	For the award of PG Certificate, students will be able to demonstrate familiarity with the chronology and physical mechanisms underlying the formation and evolution of the principal structures in the Universe, on all scales from planets to galaxy superclusters. They will be able to discuss the strengths and weaknesses of different types of observational methods, across the full electromagnetic spectrum and including non-em radiation, for determining important physical properties.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	PGT-Physics (2008)

Aims and Outcomes

Educational Aims of the Programme

To provide appropriately qualified students with a programme of academic study that will enable them to continue to higher level research in observational astrophysics, e.g. through a PhD route. To provide a postgraduate study opportunity for those who may be disenfranchised from higher education either by being full-time employees and/or residing in international locations where such opportunities are not available. To develop those learning, computational, communication and reflective skills necessary to enable students to carry out independent study in observational astrophysics and related areas. To complete a project of independent and original research in observational astrophysics using appropriate and state-of-the-art observational facilities.

Learning Outcomes

Code	Description
PLO1	Demonstrate a thorough knowledge of the definitions and key properties of major classes of astrophysical objects (planets, stars, galaxies and galaxy clusters) and a clear knowledge of the observational methods used to measure quantitative parameters for astrophysical objects (size, luminosity, velocity, chemical composition, age etc.)
PLO2	Break down complex problems into a logically structured set of achievable tasks
PLO3	Learn independently using a range of differently structured resources and learning materials
PLO4	Prioritise tasks and manage time effectively
PLO5	Possess a clear awareness of the main physical processes involved in the formation, growth, stabilisation and evolution of astrophysical objects and demonstrate a clear knowledge of the full range of observational methods used to measure quantitative parameters for astrophysical objects, including the full electromagnetic spectrum, imaging, spectroscopy and polarimetry, and non-electromagnetic tracers such as cosmic rays, neutrinos and gravitational radiation. Show originality in the application of knowledge, together with a practical understanding of the critical evaluation of research, scholarship and methodologies within astrophysical science.
PLO6	Use the relevant astronomical literature to critically evaluate and appraise current understanding of astronomical objects and processes
PLO7	Apply planning, research methodology and analytical skills to an in-depth study of a chosen research area; analyse and solve set problems and use computer skills to access the research literature and learning materials, communicate with peers and tutors and submit assessments

Code	Description
PLO8	Collect, critically analyse and interpret astronomical data from observational facilities or from on-line databases, and draw and defend conclusions.
PLO9	Demonstrate the dissemination of information and knowledge to audiences with different levels of astronomical understanding
PLO10	Display autonomy in planning, design and execution of experiments
PLO11	Communicate effectively, both in writing and verbally
PLO12	Use IT to access, prepare, process, present and transmit information

Programme Structure

Programme Structure Description

The programme is offered as a full-time course for completion in one year, and a part-time course for completion in two years. The path through the full-time route is as follows. The first two core modules, Astrophysical Concepts (7010ASTPHY) and Astronomical Techniques (7013ASTPHY) are worth 30 credits each and are taken simultaneously in the first semester, with final assessments in January. These two modules provide knowledge and understanding to underpin the specialist modules that follow. The remaining 30 credit core module, Time Domain Astrophysics (7016ASTPHY) is taken in the second semester, along with an optional 30 credit module, with final assessments for both in May. Currently, the optional module can be either Cosmology (7014ASTPHY) or Numerical Methods in Astrophysics (7015ASTPHY). Finally, the Observational Astrophysics Project (7017ASTPHY),worth 60 credits, is completed over the summer, with final submission and examination of the thesis in September. For the part-time route, students will take the following path. In the first year, they will complete Astrophysical Concepts (7010ASTPHY) with a final assessment in January, followed by Time Domain Astrophysics (7016ASTPHY) with a final assessment in May. The summer period of the first year, June to September, will be spent on preparatory exercises for the project, but there will be no further assessment, so a total of 60 credits will be completed in the first year. In the second year, the final core module, Astronomical Techniques (7013ASTPHY) will be taken with a final assessment in January, followed by an optional module with a final assessment in May. The Observational Astrophysics Project (7017ASTPHY) will be completed over the second summer, with submission of the thesis and final assessment in September. Thus 120 credits will be awarded in the second year. There is one intake of new students in September each year. To obtain an MSc., students must acquire 180 level 7 credits. Intermediate awards are Postgraduate Certificate Astrophysics (60 level 7 credits, which must be the two 30-credit core modules, 7010ASTPHY and 7013ASTPHY) and Postgraduate Diploma Astrophysics (120 level 7 credits, which must include the three 30-credit core modules, 7010ASTPHY, 7013ASTPHY and 7016ASTPHY, plus one of the 30-credit optional modules). Students who achieve the full 180 credits with an average mark of 70% or above are awarded MSc. with Distinction. Students who achieve the full 180 credits with an average mark of 60-69% are awarded MSc. with Merit. Students who achieve 40-59% are awarded MSc (Pass). Recruitment will only be onto the MSc pathway; no students will be recruited directly onto either the Postgraduate Certificate or Postgraduate Diploma programmes.

Programme Structure - 180 credit points	
Level 7 - 180 credit points	
Level 7 Core - 150 credit points	CORE
[MODULE] 7010ASTPHY Astrophysical Concepts Approved 2022.05 - 30 credit points	
[MODULE] 7013ASTPHY Astronomical Techniques Approved 2022.03 - 30 credit points	
[MODULE] 7016ASTPHY Time-Domain Astrophysics Approved 2022.03 - 30 credit points	
[MODULE] 7017ASTPHY Observational Astrophysics Project Approved 2022.01 - 60 credit points	
Level 7 Optional - 30 credit points	OPTIONAL
[MODULE] 7014ASTPHY Cosmology Approved 2022.03 - 30 credit points	
[MODULE] 7015ASTPHY Numerical Methods in Astrophysics Approved 2022.02 - 30 credit points	

Module specifications may be accessed at https://proformas.ljmu.ac.uk/Default.aspx

Teaching, Learning and Assessment

Acquisition of knowledge through pre-recorded lectures, directed reading, focused literature review exercises, coursework assignments, student discussion groups and tutorials. Learning materials principally delivered interactively by Virtual Learning Environment (Canvas) with use of other current technologies. Testing of the knowledge base, analysis and problem solving skills are assessed is through a combination of online progress tests, written assignments, formal written examinations, project report or dissertation, and oral presentations. Skills are developed through self-assessment exercises, coursework and the oral presentation of the research Project. Tutorials and feedback assist and improve the level of skill achieved. Analytic, mathematical and problem solving skills are developed through self-learning assessments, focussed literature review exercises, written assignments and tutorials. The Observational Astrophysics Project will involve both experimental and literature research, further developing skills of data retrieval, critical analysis and discussion. Experimental and literature research skills, practical experimental skills, preparing a high-level technical report and giving a technical presentation are developed through the Observational Astrophysics Project module. Computational and programming skills will be developed in many of the Project options, and are at the core of the Numerical Methods in Astrophysics module. Transferable skills are embedded on the programme. Skills are learned through completion of written assignments, participating in tutorials and collecting and transferring data via computer networks and from on-line databases, and through the Observational Astrophysics Project.

Entry Requirements

Type	Description
Other international requirements	A wide variety of qualifications may be acceptable provided that they equate to UK requirements. International students must also have an English language qualification of at least IELTS 6.5 in both spoken and written English, or equivalent as recognised by LJMU.

Extra Entry Requirements