



PHYS3810

Professional Experience in Physics and Astronomy

Session 2, Weekday attendance, North Ryde 2021

Department of Physics and Astronomy

Contents

<u>General Information</u>	3
<u>Learning Outcomes</u>	4
<u>General Assessment Information</u>	4
<u>Assessment Tasks</u>	7
<u>Delivery and Resources</u>	12
<u>Unit Schedule</u>	14
<u>Policies and Procedures</u>	15

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of [units with mandatory on-campus classes/teaching activities](#).

Visit the [MQ COVID-19 information page](#) for more detail.

General Information

Unit convenor and teaching staff

Unit Convenor, Lecturer, Academic Mentor

Richard McDermid

richard.mcdermid@mq.edu.au

Unit Co-Convenor, lecturer, academic mentor

Helen Pask

helen.pask@mq.edu.au

Project Mentor

Judith Dawes

judith.dawes@mq.edu.au

Project Mentor

Richard de Grijs

richard.de-grijs@mq.edu.au

Credit points

10

Prerequisites

10cps from 3000 level PHYS or ASTR units

Corequisites

Co-badged status

Unit description

As the PACE unit for the physics major and the astronomy and astrophysics major, this unit brings together the learning outcomes, and explores how a their major can open doors to a wide range of career paths. The unit begins with a reflective stage in which small groups build their own model of the technical themes and generic skills developed during their degree, and consider how to market these skills to potential employers. Students then develop a professional resume and cover letter targeting actual employment advertisements, and engage in peer review of their documents. The larger part of the unit provides an opportunity to engage with the broader community through a PACE activity of 100 hours duration, conducted in partnership with an industrial, research, or educational institute. Students will apply their skills to a real-world problem of interest to the partner, and report on their experiences, solutions and the project outcomes in a variety of formats including a technical report, high level executive summary, and oral presentation.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://students.mq.edu.au/important-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Apply problem-solving skills in a real-world context using discipline-specific knowledge and skills from throughout the degree.

ULO2: Employ the tools, methodologies, language and conventions of their major to develop and test new ideas.

ULO3: Articulate the goals and results of a project using different forms of communication.

ULO4: Apply techniques of project planning and time management, demonstrating the capacity to meet deadlines agreed upon with the partner.

ULO5: Demonstrate networking skills and capabilities that will assist with either moving into the workforce or further study.

ULO6: Work effectively and ethically in a multifaceted scientific environment.

General Assessment Information

In order to pass the unit, you must obtain a total mark of at least 50%, as well as a mark of at least 50% in the project report.

As a PACE unit, this unit involves a major project and, in most cases, group work. 60% of the overall mark for the unit is related to the major project, and the components of this mark are the Project Report (25%), Project Documentation (15%), Presentation (10%) and Project Performance (10%). Students will receive individual marks for each of these elements, including the Project Report (taking account of the individual contributions statement).

Project Report

Due: **Week 13** Weighting: **25%** This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

The students are required to submit a 2500-5000 word Project Report based on their external placement at the partner organisation. This will generally follow the structure of a scientific report, though some Project Reports may require a different approach, so please discuss this with your Project Supervisor, Mentor, and Unit Convenor in advance of starting to write the report. Note that in some cases Project progress and timely conclusion can be influenced by circumstances that are outside of the Student's control. This will be taken into account when assessing the report.

Students are strongly encouraged to make a specific appointment around Week 8 to discuss

their Project Report with their mentor. They should bring along an outline for their report, and any parts they have drafted.

Project Documentation

Due: **Weeks 5 and 10** Weighting: **15%**

In addition to aiding your productivity and informing your report, keeping a quality record of your work which is seen regularly by your host could also be highly beneficial should you ask them for a reference (or a job) in the future. The format of this documentation is flexible, and can be tuned to the specific nature of your PACE project. For example, some projects are well suited to keeping a lab book, either physical or electronic, which records all your daily tasks, recorded values, results, plots, thoughts, useful numbers, etc. For other projects, this documentation may come in a different form, e.g. organised notes or minutes from project meetings, well-organised GitHub commit records, or weekly progress reports.

Whatever form you and your supervisor think is appropriate, your project documentation should:

- Include a project plan formed during the first few weeks of the project. This should include key milestones and dates.
- Be legible and clearly laid out, with dates against every entry/contribution.
- Include regular entries or updates. Most projects will make weekly progress, and so should have weekly updates to the documentation collection.

Your project mentor will review your project documentation during week 5 to provide feedback on your project plan, as well as feedback on your overall record keeping. You are required to electronically submit your complete project documentation at the end of your placement (typically week 10) via iLearn. This may be a pdf of your electronic notes, or scans of your hand-written notebook.

Oral Presentation

Due: **Week 12** Weighting: **10%**

Presentations on each project are given jointly between the students in the project team, with equal contributions. Each student is expected to contribute roughly 10 minutes to the presentation, so for students working in pairs, they will present a joint 20 minute talk, with each person presenting approximately half of the work. A few minutes will be given for answering questions from the audience, comprising academic staff and fellow students. The talk should cover both the research component of the project, and the experience of working at the partner organisation. Students will be graded individually.

Reflective Journal

Due: **Weeks 2-13** Weighting: **15%**

Each student will maintain a weekly individual reflective journal consisting of 10 entries, with three parts.

Part 1: Initial self-reflection addressing the skills and knowledge gained during your degree thus far. This is the first section of the journal, and is due in Week 2.

Part 2: Reflective Diary: Eight weekly entries which capture your thoughts about the project as it progresses, and use the 'What? So What? Now What?' reflective cycle. You will be given some key topics to address in this part of your journal as you go along.

Part 3: Final reflection on the unit overall. This should be written after completing the project.

Further details and advice are provided on iLearn and in Workshop 1, and students are encouraged to contact the Unit staff for advice if they are struggling with this task.

Professional Engagement

Due: **Week 13** Weighting: **15%**

In order to develop increased awareness of professional development activities, over the course of the semester, students will engage in activities such as

- joining a professional organisation,
- attending Physics and Astronomy Department colloquia and seminars,
- attending a careers event,
- reading and discussing a journal paper or an article in Australian Physics,
- volunteering to help on University Open Day, and/or
- giving a presentation at a school.
- reading and discussing the code of conduct of a professional society.
- learning a new skill (e.g. soldering workshop, AfA training)

Further examples and instructions will be provided on iLearn. 'Professional engagement credits' will be awarded for these activities, up to a total of 15, with no more than 5 credits for similar activities.

Each student needs to prepare and submit a **Record of Professional Engagement**. This should be one single document with a summary table at the beginning that documents each activity and the number of credits claimed. Then for each activity, please provide a few details, a piece of evidence of your activity, and describe in a few sentences how each activity has *contributed to your professional development and career prospects as a scientist*. You may wish to use the word template provided on iLearn to document each activity. Photos are encouraged.

CV and Cover Letter

Due: **Week 12** Weighting: **10%**

This activity will demonstrate the skills and techniques explored during Workshop 3, where you will have received feedback on your draft job application (in the form of a cover letter and curriculum vitae in response to a genuine job advertisement). The job application needs to be tailored specifically to the job opening, by showing how your skills and capabilities meet the advertised selection criteria.

Project Performance - Mentor Report

Due: **Week 13** Weighting: **10%**

There is no submission required for this task, as the report is provided by the Project Mentor. However, keep in mind that input will be obtained from your project host supervisor, who will be looking for things like work ethic, communication skills, organisation, and professionalism during the placement.

Workshop participation

Due: **Friday weeks 1 and 11** Weighting: **0%**

There are three mandatory workshops scheduled. Workshop 1 (Unit Introduction and Orientation) and Workshop 2 (My Degree - themes, skills, knowledge) will run sequentially on Friday 31st July (Week 1), with a break for lunch (will be provided). Workshop 3 (CVs, Cover Letters and Job Interviews) will be held on Friday of Week 11).

Students must participate meaningfully in all three workshops. *If you miss a workshop due to unforeseen circumstances, you should apply for [special consideration](#).*

Assessment Tasks

Name	Weighting	Hurdle	Due
Professional engagement	15%	No	Week 13
Reflective journal	15%	No	Weekly entries during project
Oral presentation	10%	No	Week 12
Project Report	25%	Yes	Week 8 (draft) and week 13 (final)
Project documentation	15%	No	Week 5 and week 10
CV and cover letter	10%	No	Week 12
Mentor report	10%	No	Week 13 (from project mentor)

Professional engagement

Assessment Type ¹: Portfolio

Indicative Time on Task ²: 11 hours

Due: **Week 13**

Weighting: **15%**

A key role of professional scientists is engaging both with other scientists (through attending seminars) and with the public (through outreach activities). Various opportunities for such activity are available throughout the semester, and may also arise as a result of the placement (e.g. events at the host organisation). To encourage a pro-active approach professional development, students will build a portfolio of such activities that they chose and plan themselves, and will be required to accrue 'professional engagement credits' during the course of the unit. Activities may include attendance of research seminars, career networking events, and public outreach activities. Diversity of activities is also required.

Students must document their Professional Engagement by providing evidence of engagement and learning, e.g. for seminar attendance, give the date, speaker name, title, and short summary (few lines) of the talk. They may include photos, or any other relevant evidence of the activity. Each activity must include a few sentences describing how the activity has contributed to the student's professional development and career prospects as a scientist.

On successful completion you will be able to:

- Demonstrate networking skills and capabilities that will assist with either moving into the workforce or further study.
- Work effectively and ethically in a multifaceted scientific environment.

Reflective journal

Assessment Type ¹: Reflective Writing

Indicative Time on Task ²: 8 hours

Due: **Weekly entries during project**

Weighting: **15%**

Each student must maintain an individual reflective journal on iLearn consisting of three parts:

Part 1: Initial self-reflection addressing the skills and knowledge gained during your degree thus far. This is the first section of the journal, and should be completed before starting the project.

Part 2: Weekly reflective diary entries, capturing thoughts about the project as it progresses, written using a reflective learning cycle. Students will also be given some key topics to address in this part of their journal. These entries should be written throughout the semester. Bulk submissions in the last weeks will be penalised.

Part 3: Reflection on the project overall. This should be written near the project's completion, and should address: i) What were the main learning outcomes arising from the project? ii) Given the experience in the project, what do students now feel are the most valuable or attractive attributes of their future workplace? How have these changed from before? iii) If the unit could be repeated, what would students do differently and why?

Journal entries are only visible to the unit convenor.

On successful completion you will be able to:

- Articulate the goals and results of a project using different forms of communication.
- Demonstrate networking skills and capabilities that will assist with either moving into the workforce or further study.
- Work effectively and ethically in a multifaceted scientific environment.

Oral presentation

Assessment Type ¹: Presentation

Indicative Time on Task ²: 7 hours

Due: **Week 12**

Weighting: **10%**

Each student will give a presentation (with time for questions from the audience) on their work in the final week of session. For students working in pairs, they may present a joint talk, as long as each person presents approximately half of the work. The talk should cover both the research component of the project, and the experience of working at the partner organisation.

On successful completion you will be able to:

- Apply problem-solving skills in a real-world context using discipline-specific knowledge and skills from throughout the degree.
- Employ the tools, methodologies, language and conventions of their major to develop and test new ideas.
- Articulate the goals and results of a project using different forms of communication.
- Apply techniques of project planning and time management, demonstrating the capacity to meet deadlines agreed upon with the partner.

Project Report

Assessment Type ¹: Report

Indicative Time on Task ²: 10 hours

Due: **Week 8 (draft) and week 13 (final)**

Weighting: **25%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

The students are required to submit a Project Report based on their external placement at the

partner organisation. This will generally follow the structure of a scientific report, including introduction to the project topic, description of the data, tools and methods used, presentation of results and analysis, discussion of the findings, and conclusions. Typically, students will work in pairs with the partner. In those cases each student is expected to contribute equally to the project report, and the report must include a statement describing the contributions of each student to the joint project.

The Project Report is a Hurdle Assessment. Students must obtain a mark of at least 50% in the report to be eligible to pass the unit. If the mark for the report is less than 50%, students may be given a chance to revise and resubmit the report. The mark awarded for the revised report towards the final unit mark will be capped at 50%.

On successful completion you will be able to:

- Apply problem-solving skills in a real-world context using discipline-specific knowledge and skills from throughout the degree.
- Employ the tools, methodologies, language and conventions of their major to develop and test new ideas.
- Articulate the goals and results of a project using different forms of communication.
- Apply techniques of project planning and time management, demonstrating the capacity to meet deadlines agreed upon with the partner.
- Work effectively and ethically in a multifaceted scientific environment.

Project documentation

Assessment Type ¹: Lab book

Indicative Time on Task ²: 0 hours

Due: **Week 5 and week 10**

Weighting: **15%**

Documentation is a key component to any project, and acts as an important record of progress during the semester. It will also form an invaluable record when writing the final report, and will allow students to easily pick up where they left off the previous week when returning to the project. The format of this documentation is flexible, and can be tuned to the specific nature of the PACE project. For example, some projects are well suited to keeping a lab book, either physical or electronic, which records all the daily tasks, recorded values, results, plots, thoughts, useful numbers, etc. For other projects, this documentation may come in a different form, e.g. organised notes or minutes from project meetings, GitHub commit records, or progress reports. The documentation is completed during the PACE activity.

On successful completion you will be able to:

- Apply problem-solving skills in a real-world context using discipline-specific knowledge and skills from throughout the degree.
- Employ the tools, methodologies, language and conventions of their major to develop and test new ideas.
- Apply techniques of project planning and time management, demonstrating the capacity to meet deadlines agreed upon with the partner.

CV and cover letter

Assessment Type ¹: Non-academic writing

Indicative Time on Task ²: 5 hours

Due: **Week 12**

Weighting: **10%**

Students will be required to provide a cover letter and curriculum vitae (CV) in response to a genuine job advert that they have researched and selected. An open application to an organisation chosen by the student is also permitted if a suitable job advert is not available. Students will be expected to use the tools and techniques acquired during the unit to find a suitable job opening or organisation, and provide job-specific application materials in the form of a CV and cover letter.

On successful completion you will be able to:

- Demonstrate networking skills and capabilities that will assist with either moving into the workforce or further study.

Mentor report

Assessment Type ¹: Teacher performance assessment

Indicative Time on Task ²: 0 hours

Due: **Week 13 (from project mentor)**

Weighting: **10%**

The Macquarie Project Mentor will provide a report on each student's individual performance during the project. This will be based partly on input from the external project supervisor at the host organisation, as well as exchanges with the Project Mentor during the course of the project. The report will grade performance on topics such as meeting the learning outcomes of the unit, the quality of the student's contribution to the project and partner organisation, and ability to work as part of the project team.

On successful completion you will be able to:

- Apply problem-solving skills in a real-world context using discipline-specific knowledge and skills from throughout the degree.
- Employ the tools, methodologies, language and conventions of their major to develop and test new ideas.
- Apply techniques of project planning and time management, demonstrating the capacity to meet deadlines agreed upon with the partner.
- Work effectively and ethically in a multifaceted scientific environment.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Learning Skills Unit](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Workshop Activities

There will be three main workshops associated with the unit, for which attendance is mandatory:

Workshop 1 (*Friday morning Week 1, Location and time will be posted on iLearn*): *Unit Orientation*. This introductory morning workshop will review the unit goals, give students the chance to introduce themselves and their project, and review some basic content on best work practices, health and safety, ethics, professional development, and reflective practice. These are essential tools for making the most of your practical experience during the unit.

Workshop 2 (*Friday afternoon Week 1, Location and time will be posted on iLearn*): *My Degree - Themes, Knowledge and Skills*. This afternoon workshop follows on from workshop 1, and will be aimed at reflecting on the skills and knowledge you have gained across your degree, how this might map to potential employers, and what they are looking for. We will look at how to recognise our strengths and make best use of them; as well as identifying areas where we can improve, and make plans on how to develop those areas during the unit.

Workshop 3 (*Friday Week 11, Location and time will be posted on iLearn*): *Presentations, CVs, Cover Letters, and Job Interviews*. This workshop will focus on two key opportunities where we present ourselves to our colleagues in a professional context: giving a formal presentation and giving a job interview. The workshop will look at techniques for delivering an informative and professional presentation, and will go through the process involved in a typical professional job interview. We will use a combination of delivered content and group exercises, including practice interviews, with a focus on developing confidence and experience in presenting in different

situations.

Due to COVID-19 Safety Restrictions, these workshops may have to be run online - see the unit iLearn page for the latest information.

Project

The main component of this unit is a project conducted with an external partner organisation. Projects range from pure research to projects with a more educational or outreach flavour. All projects, however, should give you exposure to a professional working environment, and the opportunity to contribute to a larger effort related to professional physics. You will spend nominally 100 hours working with the partner organisation, spread throughout the semester. We suggest you spend one week of the mid-semester break, and 9 Fridays working with the external organisation, however the hours will need to be negotiated with your external supervisor and you may be required to spend additional days during the mid-semester break. Projects should normally start in Week 2, concluding in Week 10, but again there will be some variations in schedule according to particular circumstances. If you miss a day of your placement due to unforeseen circumstances, you should plan to make up the hours and/or apply for [special consideration](#).

We will do our best to advise all students about their placement and project prior to Week 1. However we regret if due to circumstances beyond our control this is not possible for all students.

Supervisors and Mentors

Students will have a supervisor at the host organisation, who is able to devote some time to supervising the students on the days that they work with the host organisation. At the start of the project, agree on a time or day when you are most likely to have overlap with your supervisor. If you don't have regular access to your project supervisor, let the unit convenor know as soon as possible so that alternative arrangements can be made. The Physics and Astronomy Department at Macquarie University also appoints a PHYS3810 academic mentor to liaise with the host organisation, monitor progress and assist in advising students. Students will meet with their University mentor at least three times during the semester to review project documentation, progress against project objectives, etc. Some of these meetings will involve the host supervisor and academic mentor (usually around week 2 and week 10), and you are required to make an appointment with your Mentor during week 5 so they can review your project documentation and discuss your project plan with you. Owing to Covid-19 constraints, some meetings may take place by Zoom.

Required Unit Materials

In the event that you are working within the premises of the partner organisation. Compliance with standard Work Health and Safety (WHS, sometimes also called Occupational Health & Safety, or OH&S) practice is expected. This includes wearing appropriate clothing and footwear (e.g. covered shoes), and following all workplace rules as defined by the Partner. If you are unsure of these rules, ask your supervisors.

Required Text

Not applicable, but project supervisors may recommend relevant readings.

Record Keeping

Each student must maintain project documentation. The documentation needs to be completed *for each day of work on the project*. Students may be required to hand in their documentation to the Partner supervisor at the end of the unit.

Teaching Strategy

Students spend around 100 hours working within the host organisation. This time should be used effectively in the pursuit of the objectives identified by the partner supervisor and unit learning outcomes. A clear understanding of the project objectives and appropriate planning will facilitate progress towards the project objectives. Students are expected to regularly graph and analyse their results (if appropriate), and keep comprehensive and up-to-date records. The host supervisor and University mentor will review the records to ensure good practice in this respect.

Unit Schedule

PACE

PACE stands for Participation and Community Engagement. By connecting students with partner organisations, PACE gives Macquarie students the chance to contribute their academic learning, enthusiasm and fresh perspective to the professional workplace. The Physics and Astronomy Department have run a PACE unit since 2013. PACE activities have included outreach and science communications, activities at either the Australian Astronomical Observatory or CSIRO Astronomy and Space Science, and working at local tech companies like Baraja and Raytheon.

Attendance

The unit has two key elements: Skills Workshops (3 workshops over 2 days), and External Project (14 days over semester). Attendance of these two components is mandatory.

Students are expected to work standard work hours on the days they agree to work with the host organisation, and may be required to be on-site at the host organisation when undertaking the project. The total project duration is 14 days. Typically, students will devote one day a week (nominally Friday) during 2nd semester (Weeks 1 to 11), and one week (5 days) during mid-semester break, working on the project with the partner institution. On some of these days some time may be spent at the University or elsewhere pursuing the objectives of the project with the agreement of the partner supervisor.

In addition, there will be several 'workshop' activities during the semester on topics including ethics, communication, and career skills (see above).

Professional Engagement

A total of 15 'Professional Engagement' credits must be earned by participating in professional activities during the semester. This includes mandatory attendance of at least 3 seminars/ colloquia (worth 1 credit each) over the course of the semester. Additional credits can be gained by participating in suitable professional development activities, such as external skill development workshops, building a professional online profile, public outreach, etc. The unit

convenor has the final say on what counts for credit and at what level.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Enquiry Service

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

Equity Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.