

Year 2 Astro Projects

2020

Introduction

The purpose of the introductory meeting and these notes is to describe the organisation of Y2 Astro projects, present the available projects, and to outline how your work will be assessed. The basic aim of the projects is to develop your investigative skills in an area of astronomical research, to extend your horizons beyond the coursework, and to help give you the confidence to carry out a significant investigation.

Students will work in **groups of 3** on a project that lasts throughout the term. The starting point for each project will be the project outlines that are available on the wiki page linked to the Canvas page for this module. The outline may mention just the basic idea or principle; the investigation will be driven by your own efforts. Initiative and original ideas will be rewarded. As always in project work, organised and conscientious work are the key to success.

People involved in the Astro projects are:

Graham Smith (gps@star.sr.bham.ac.uk) [in charge]

Matteo Bianconi (mbianconi@star.sr.bham.ac.uk)

Cressida Cleland (cressidac@star.sr.bham.ac.uk)

Oliver Hall (ojh251@student.bham.ac.uk)

Tanda Li (t.li.2@bham.ac.uk)

Dan Ryczanowski (danr@star.sr.bham.ac.uk)

Selection of Projects (Autumn term)

Each group of 3 students must rank the projects in order of preference and submit this list on Canvas (one submission per group), together with names of all students in the group. The deadline for submission is December 13, 2019.

Running of Projects (Spring term)

Laboratory Notebooks

You must keep a careful note of everything you do in a notebook, including details of references consulted, discussions with demonstrators, measurements, etc. Each student will keep a separate notebook with their individual records and observations. There may be some items (e.g. sets of measurements/results) which may occur in one notebook only; in this case, they should be referenced clearly in the partner's notebook.

It is essential that your notebook represents a record of your experimental efforts, reflecting the progress and setbacks of your work. It must be written during the project sessions, although some

plans, calculations, notes etc, will be added outside lab. There is no point in your book being a polished and edited version of your work: that is the purpose of the formal report. Lab notebooks will be handed in along with your final report at the end of the project. Appropriate use of your notebook will be taken into account in the final assessment.

Writing up

Of equal importance to your laboratory work is your writing of a formal report on your project, data taking and analysis of results. It is essential that you do not leave the report until the last minute. Although there are two weeks at the end of the term which can be devoted solely to report writing (as the experimental work should be completed by then), it is very important to have thought about how you will analyse your data before experimental work finishes. This will almost certainly affect what measurements you want to take.

Beware of leaving things to the last few days when there will be great pressure on computers, printers etc.

Computer (and similar) difficulties will not be accepted as an excuse for late hand-in.

Planning

This 11 week project is a longer activity than most students will have undertaken before. This means that realistic planning is important. Not only should you factor in the time that obtaining data will take, but you should have alternatives planned in case your initial plans do not work. It is rare for everything to go the way one hopes, so flexibility is vital. Planning is given credit in the assessments.

Location of projects and Laboratory Hours

Projects will be undertaken in Astrolab, i.e. on the mezzanine floor above the ground floor of Poynting building. The times for Astro projects are Monday and Thursday afternoon 2-5pm. Most projects can be progressed without access to the computers in Astrolab, so you are able to continue working on your projects outside of the lab times.

Some of the projects may involve working in the evening at the Observatory. This will be discussed with the relevant groups.

Supervisors

Your project supervisor will generally be in the laboratory during the main sessions and it is your responsibility to discuss your progress with them once a week. Your supervisor will sign your lab book to indicate that this meeting has taken place.

Please be aware that all of the staff involved in Y2 Astro Projects, including those who are PhD students are also conducting their own research during the term. It is therefore common for staff to miss a few lab sessions due to attending conferences or their own observing runs at international observatories. We will keep any disruption caused by such absences to a minimum.

Safety

While the projects are generally computer based (with no real safety concerns), there are some issues at the observatory. We will discuss those next term with the relevant groups.

General

- Keep in close touch with your supervisor.
- Keep the laboratory safe and tidy.
- Be patient – supervisors can't speak to everybody at the start of a lab session.
- Contact the lab leader for general advice, or with problems that cannot be resolved in the normal way.

Assessment

The assessment of the projects is based on four areas, covering experimental work, written reports and an oral presentation.

Assessment is primarily carried out by the supervisor. The lab leader will perform moderation in consultation with the supervisors.

1. Preliminary Report (up to 10 marks)

Each student will write a concise (4 pages maximum, including all figures, references, tables, and any appendices) introduction to the project, in their own words. The aim is to show that the key areas of the project has been understood and to give a logical description of how the project will be carried out, indicating the main objectives and a plan showing when key decisions will be made and how the available time will be used. The preliminary reports will be handed in during the 3rd week of the Spring term.

2. Oral Presentations (up to 10 marks)

Each group of students will give a short talk, outlining the principles of the project and giving a brief progress report on their work (15 mins long, plus 5 minutes questions). The talk will be shared between the students with all participating in the presentation and in answering questions. Discuss with your supervisor how you should present the talk.

The presentations will take place towards the end of the project (approximately week 8/9). They will take place during a lab session, generally with the supervisor and a “second eye”.

3. Laboratory Work (up to 40 marks)

In general, conscientious work will pay off handsomely, while poor planning and procrastination will generally lead to disaster. To achieve good marks, it is not necessary that the project achieves its original goals; marks are awarded for logical, organised effort and for perseverance in the face of difficulties and for effective working as a team. Good ideas and innovations are also rewarded. Each student will receive an individual mark for their work in the lab.

Each student's laboratory notebook should also be handed in along with the formal report. While the notebook is not formally marked, it will be read and will be used in formulating the mark for the laboratory work mark (in conjunction with the impression that the supervisor has developed during the course of the project).

4. Formal Report (up to 40 marks)

Each student will write a report on the project. It will be formal in the sense that it will follow the standard style (Abstract, Introduction, references etc.). Guidance (and reminders) on report writing are provided and will be available in the lab later. Marks will be given for both the presentation of the report and for the astrophysics content.

The formal report and lab books will be submitted at the end of the Spring term. Please submit your lab book to the Education Support Office and submit your report via Canvas. The final hand-in date is Friday 27th of March 2020.

Summary of Timetable

Week 8, Autumn term: Monday 18th November 2019	Introductory meeting
Week 11, Autumn term: Friday 13th December 2019	Project choices submitted (on Canvas)
Week 1, Spring term: Monday 13th January 2020	Projects begin
Week 3, Spring term: Friday 31st January 2020	Hand in preliminary reports (on Canvas)
Week 8/9, Spring term: March 2nd – March 12th 2020	Oral presentations
Week 9, Spring term: Friday 13th March 2020	Data collection ends. Writing continues
Week 11, Spring term: Friday 27th March 2020	Hand in final reports (on Canvas) plus laboratory notebooks (to ESO)

Actions

The essential steps to be done this term are:

1. Choose a group (usually of 3 students)
2. Submit 1st, 2nd, 3rd, 4th choices of project before the Christmas vacation.

Graham Smith (email: gps@star.sr.bham.ac.uk)

November 2019