Extragalactic Astrophysics and Cosmology
Year 3 Group Study 2013

Management Plan

23rd January 2013

1 Roles

The lead roles that have been agreed for the Extraglalctic Astrophysics group are as follows,

Chair	Joe Baumber
Seminars	Dorothy Stonell Joe Baumber
Editors	Josh Wainwright Lewis Clegg
Communications	Dorothy Stonell
Subgroup Leads	Bethany Johnson Mike O'Neill
Subject leaders	Graham Smith Alistair Sanderson Meilissa Gillone

The team members are distributed into sub-group as follows,

Predictions	**Observations**
Bethany Johnson	**Mike O'Neill**
Jamie Bryant	Joe Baumber
Owen McConnell	Dorothy Stonell
Lewis Clegg	Catherine McDonald
Andrew King	John Shepley
Josh Wainwright	Rahim Topadar
Alistair Sanderson	*Melissa Gillone*

2 Aims of the project

Overall To develop an observing strategy for measuring the redshift at which the universe was completely re-ionized, and the redshift interval over which re-ionization took place.

Prediction group To generate realistic predictions via computer aided calculations of what the observing group aims to study and might expect to detect, in terms of numbers of galaxies per unit area, luminosity and redshift.

Observing group Research the observational techniques and practices available for looking back to Re-ionization. Then decide on an observational strategy to test the predictions.

2.1 Combined Deadlines

Date	Time	Task
Tuesday 22nd Jan	2pm	Have attempted Q1-3 of worksheet
Wednesday 23rd Jan	4pm	Hand in management plan
Tuesday 29th Jan	2pm	Have attempted Q4-5 of worksheet
Monday 4th February	4pm	Hand in worksheet
Tuesday 26th February	4pm	Begin seminar discussion/preparation
Tuesday 12th March	1pm	Deliver seminar
Thursday 14th March	4pm	Hand in personal statement
Friday 15th March	12-4pm	Deliver Viva
Monday 18th March	11am	Report to editors
Firday 22nd March	3pm	Hand in report.

2.2 Session Structure

There are three arranged weekly sessions that all or part of the group will attend as well as one or more of the subject leaders. These are outlined below.

Session	In Attendance	Structure
Tuesday 2-4pm	Whole group including all subject leaders	30 minute catch up on progress, remaining time for issues and other queries (potenially split into sub-groups)
Tuesday 4-6pm	Both sub-groups	Each sub-group continues with required work, with interaction between sub-groups if necessary
Thursday 2-4pm	Alastair Sanderson and Predictions group	Predictions group continue with work, discussing progress, problems and suggestions with Alastair
Thursday 4-6pm	Both sub-groups	Each sub-group continues with required work, with interaction between sub-groups if necessary
Friday 4-6pm	Melissa Gillone and Observations group	Predictions group continue with work, discussing progress, problems and suggestions with Melissa

3 Predictions Group Plan

1. Determine the goals of the program: ask Al what the program mainly needs to output.
2. Research current simulations and methods: websites, books, papers, past projects. The research is split into sections
   - Solid angle conversions etc.: Andy, Jamie

- Variables and constants to use etc.: Owen, Lewis
- Extra considerations to increase accuracy etc.: Beth, Josh

3. Produce the design plan for program structure: determine cosmic parameters, decide on main outputs of program and how they will be structured, and assign areas of coding to each of the three 'coders'. Continue researching into the theory to support the program and quantify the features i.e. redshift, luminosity, density etc. The main contributers to the code will be Andy, Josh and Owen.
4. Begin to build the program (alpha).
5. Test preliminary program (alpha) with known values so that we can determine that the program acts as anticipated, if this is not the case then rectify this however if the program runs as hopes then proceed to step 6.
6. Refine program (beta).
7. Test beta. Again, if it requires editing or refining then that is the priority. Whilst this is being looked at by the testers, the values should be overlooked and verified by those working on the calculations. Furthermore, those working on the calculations should be helping the computing people to document their progress.
8. Produce final program with values that can be fed through to the telescope group.
9. Write everything up in the report.

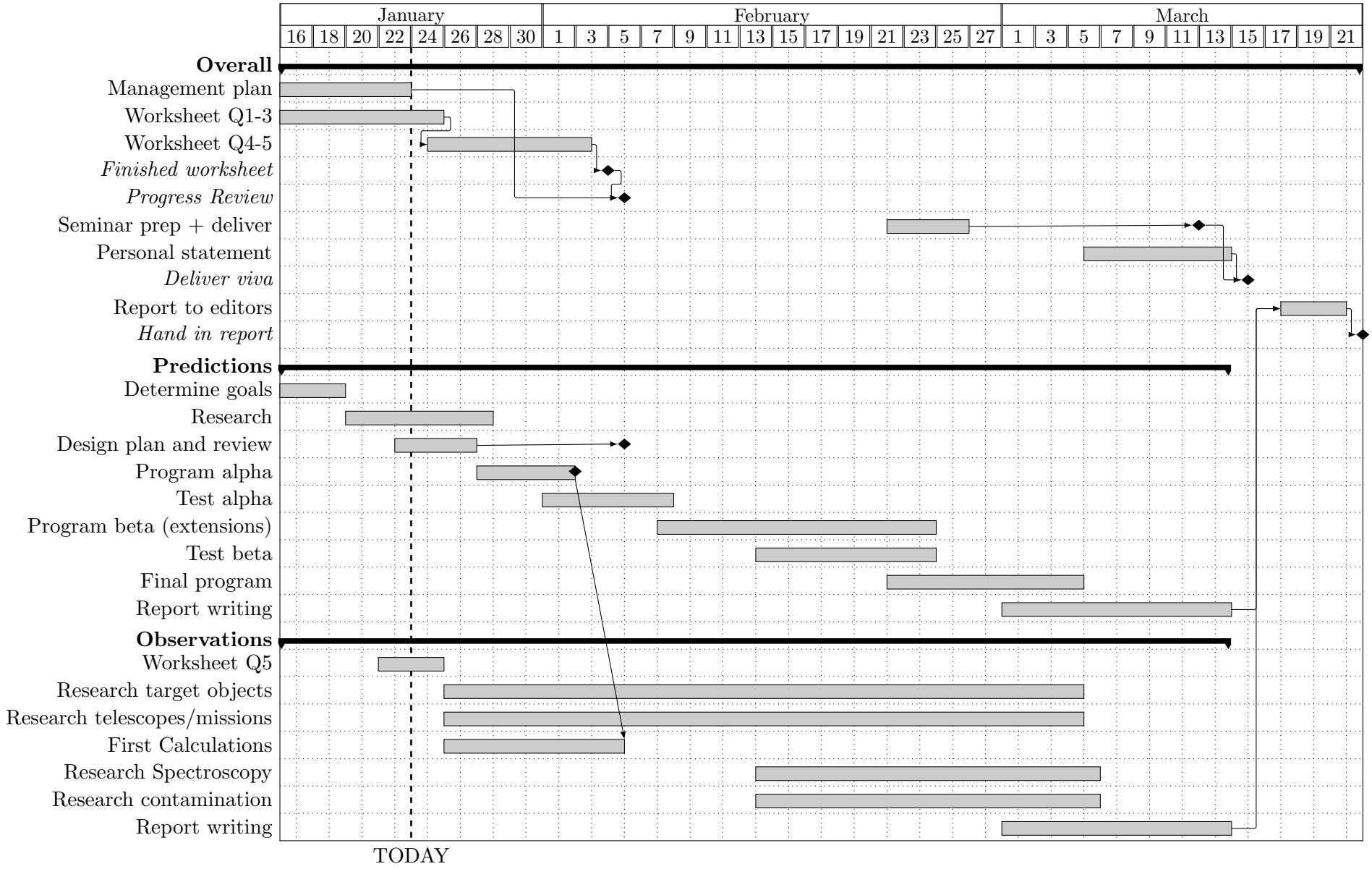
4 Observations Group Plan

1. Sub-group A - Understand the Epoch of Re-ionization (EoR), the physics that took place, the objects created at this time (e.g. quasars/Lyman Break galaxies) and how this enables us to study this period. - Mike, Catherine and John.
2. Sub-group B - Research current studies and missions looking into the EoR, what equipment they are using (e.g. ground/space telescopes), combined with which techniques are favoured (e.g. photometry, spectroscopy). - Rahim, Joe, Dorothy.
3. Understand and carry out calculations that will be required (e.g. signal/noise, luminosity, redshift, exposure times). To help with this, the observing group will complete Q5 from the worksheet before the rest of the group.
4. Look into future/proposed projects such as Euclid and James Webb telescopes; their capabilities, intended fields of study and timescales etc.
5. Investigate areas of contamination in the sample, the impact of other objects such as dust and stars along with other sources of error.
6. Once the predictions have been made, decide on a telescope that best enables us to take accurate measurements and give reasons why other options are less suitable. As part of this strategy we will need to decide a direction to aim our telescope and the size of our field of view as well as exposure times. If it is possible and suitable, both a telescope currently in existence and a proposed telescope will be selected, to represent the best observations available today and at a future date.

5 Potential Risks

As part of the management plan it is important to consider potential risks that could present themselves as the project progresses. These risks are discussed below.

- Meeting deadlines for work; every member of the group needs to stay on top of the large amount of work required so that deadlines can be met.
- Getting stuck on work; this applies to teams as a whole and individual members, to always ask for help as soon as it is clear that no more progress can be made on a piece of work.
- Editing the final report; if there proves to be too much work for the current Editors, an extra Editor will be drafted in from the group.


January
February
March
16 18 20 22 24 26 28 30 1 3 5 7 9 11 13 15 17 19 21 23 25 27 1 3 5 7 9 11 13 15 17 19 21
Overall
Management plan
Worksheet Q1-3
Worksheet Q4-5
Finished worksheet
Progress Review
Seminar prep + deliver
Personal statement
Deliver viva
Report to editors
Hand in report
Predictions
Determine goals
Research
Design plan and review
Program alpha
Test alpha
Program beta (extensions)
Test beta
Final program
Report writing
Observations
Worksheet Q5
Research target objects
Research telescopes/missions
First Calculations
Research Spectroscopy
Research contamination
Report writing
TODAY