Getting Started on Your PhD

1 People

- Astronomy Unit (AU) = Cosmology + Planets + Plasmas. Chris Clarkson is the current head.
- **Cosmology:** David Mulryne and Karim Malik (early universe / perturbation theory), Tim Clifton and Chris Clarkson (GR / relativistic effects), Alkistis Pourtsidou and Phil Bull (radio astronomy / galaxy surveys), Will Sutherland (galactic science), me (modified gravity / gravitational waves).
- **Planetary Science:** Richard Nelson, Craig Agnor, Tom Haworth, Ed Gillen, Sijme-Jan Pardekooper.
- **Plasma Physics:** David Burgess, David Tsiklauri, Chris Chen.
- **Managerial/professional:** Peter Hobson (Head of School), Sri Kulandaivelu (PA to Head), Ruth Wilkinson (School Manager, best person to ask for practical things about the building), Rob Miles (postgraduate programmes officer). You might also get emails from IT staff: Alex Owen, Cozmin Timis, Jonathan Angebeh.

2 Meetings

- **Journal club:** Wednesdays 2pm, takes a break during Christmas/summer holidays. Organised by Paula Soares.
- **Cosmology seminar:** Wednesdays 3:30pm, usually external speakers. Upcoming: `https://www.qmul.ac.uk/spa/astro/events/london-relativity-and-cosmology-seminar/`. When seminar and questions are over, staff leave the room and students/postdocs have some more time with the speaker. Organised by Catherine Watkinson.

  When in person, we often take them out for lunch beforehand and/or to the QMUL SCR afterwards (SCR = bar/lounge area over in the Queen's Building, serves food and drinks, staff and PhD students only).
- **AU colloquium:** *most* Fridays 2:30pm during term time. Not always cosmology, but you should attend (good for general background knowledge and knowing what colleagues are working on).
- **Postgraduate Astronomy seminar/discussion:** This used to run at 4pm on Fridays, grad students only. Hopefully it restarts – ask older students?
- **Group meeting:** 3pm Thursday afternoons, with a little flexibility.
- **Individual meetings:** At least once per week, most likely Mon / Tues afternoons.
- **UKCosmo:** Good for meeting UK community. Join the mailing list. Few times a year.
- **LCDM:** London Cosmology Discussion Meetings, half-day of talks, usually at the Royal Astronomical Society on Piccadilly. Once a month during term. Currently paused. `https://londoncosmology.net/lcdm/`

3 Tools

- **Communication:** Slack – CosmoRel group + other experimental collaborations, conferences...
- **Calls:** Zoom, Microsoft Teams for calls (Teams is the official university choice).
- **Writing:** Overleaf, online collaborative LaTeX platform: `https://www.overleaf.com`. Optional: an offline TeX editor, e.g. TeXShop.
- **Reading/storing papers:** Lots of options, e.g. check out `https://www.ref-n-write.com/trial/top-referencing-too` Endnote and Mendeley are two of the biggest (by a quirk of history I use Papers3).

- **Calculations:** It's worth knowing at least the basics of Mathematica, maybe more. QMUL's download and licence details are here: `https://www.its.qmul.ac.uk/support/self-help/software/free-and-discounted-software/mathematica/`.

  Might be useful later: Xact is an extension package of Mathematica that can prove useful in Lagrangian manipulation, cosmological perturbation theory, etc.: `http://www.xact.es/index.html`. It has many subpackages, xTensor and xPand are the most useful (in my experience). However, Xact takes some self-training to use. There's a tutorial on applications to modified gravity theory on the documentation page.

  Some of the older PhD students likely have Mathematica experience/recommendations..

- **Code:** Lots of editors out there, you probably have a favourite already. I do things old style with BBEdit + terminal, but there are a lot of fancier environments out there: Atom, Visual Studio Code, PyCharm. The Jupyter interface (`https://jupyter.readthedocs.io/en/latest/#`) is good for 'presenting' Python notebooks, i.e. when you want to share code with lots of explanatory comments, even TeX equations.

- **Package Manager:** Brew for mac. Equivalent for Windows??

- **Code sharing:** GitHub `https://github.com` . If you haven't used `git` before, I'd recommend walking through the tutorial of creating, pushing and pulling repos. The number one rule to avoid ending up in a mess is: **always pull before you push anything to the repo**. I'd recommend keeping your repos private unless you're publishing something officially.

  I really like this quick reference guide: `https://rogerdudler.github.io/git-guide/`.

- **Notes:** I'd recommend some sort of note-taking software. Hardcopy notes can work too if you're organised, but are less portable/searchable. I use Evernote (just the free version): `https://evernote.com`.

- **Other:** Dropbox, Google Docs, Sheets and Slides. I use 'Things' app to organise projects, to-dos and deadline, but this is purely personal preference.

4 Other

- **ArXiv:** You should be reading the ArXiv everyday at some level. I'd recommend keeping an eye on both astro-ph.CO (cosmology) and gr-qc. I do this by signing up for the daily email bulletin, but this is a preference.

- **Experiments:** as a group we have involvement with Euclid, LSST (now the Vera Rubin Observatory) and LISA. Each of these has a consortium behind it (hundreds of people), divided into sub-units. Most of our involvement comes through a cosmology/theory subgroup that organises via telecons and emails.

- **Apocrita** is QMUL's supercomputer, you can register for an account here: `https://docs.hpc.qmul.ac.uk`.

- **Conferences/PhD Student 'Schools':** Keep an eye out for these and ask me. There are a lot out there, so it is worth being selective.

- **Central Services:** As well as our local IT staff in SPA, there is a central QMUL IT service (ITS). You can raise a ticket with their helpdesk here: `https://helpdesk.qmul.ac.uk/QMULServiceDesk.BridgeIT#dashboard` (log in, select IT services). There's also lots of FAQ, how-to guides, and access to Estates (building services).

- YouTube channel of people explaining their papers: `https://www.youtube.com/c/CosmologyTalks/featured`

- **Books:** QMUL library has some things you might need, but generally more undergraduate-focussed. Let me know if you really need something you can't get hold of.