

# Managing your PhD

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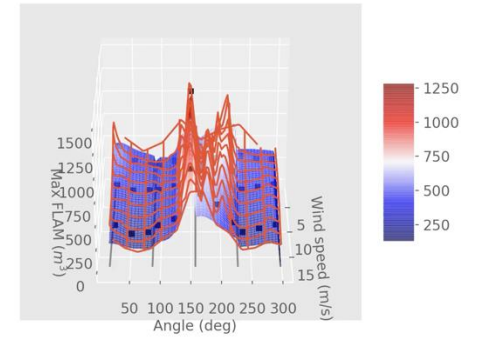
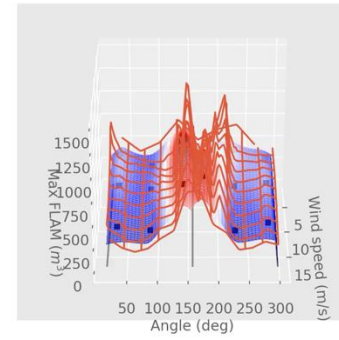
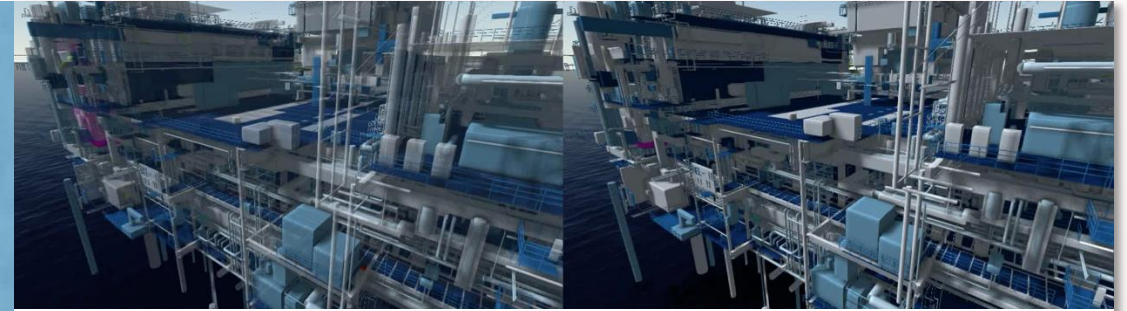
# The EAGLE simulations

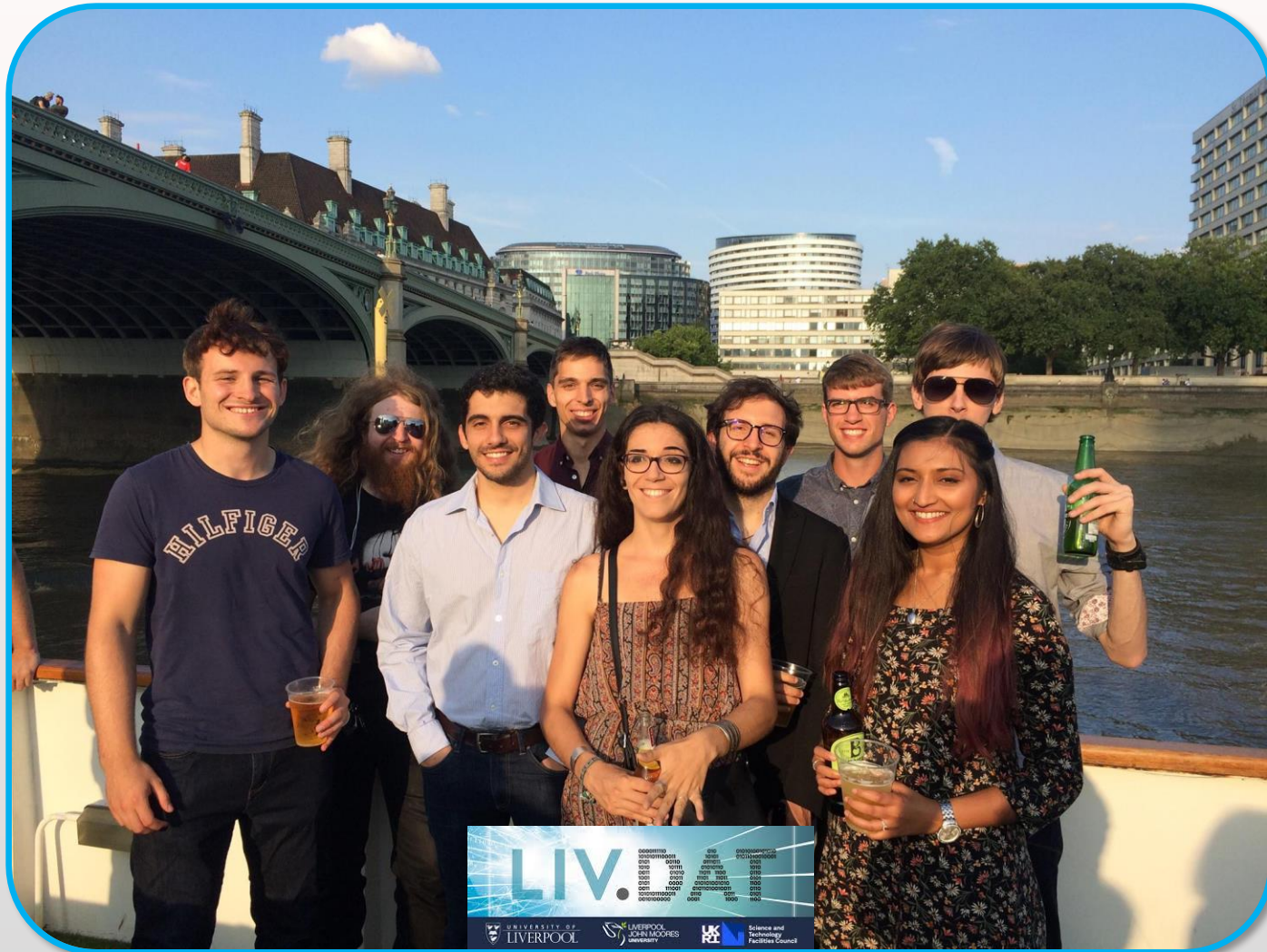
EVOLUTION AND ASSEMBLY OF GALAXIES AND THEIR ENVIRONMENTS

A project of the Virgo consortium

$z = 19.9$   
 $L = 25.0 \text{ cMpc}$

Visible components:  
CDM

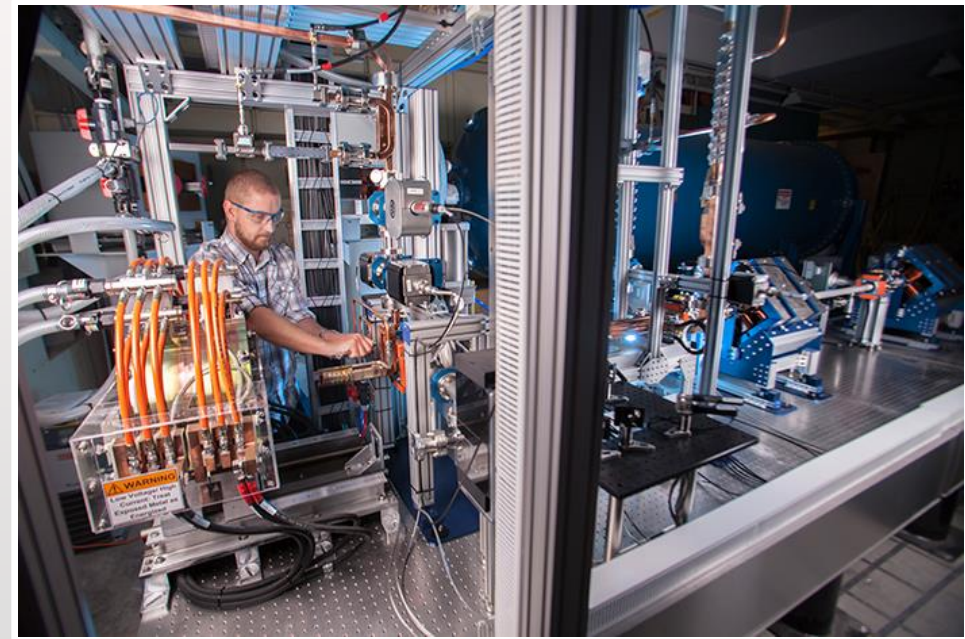




- My PhD experience will (hopefully!) not be reflective of yours over the four years
- The advice here is based on what worked for me, and I didn't do this all the time
- There may be different expectations in your field



# What is different about a PhD?



# Short timescales: Doing the work

## Coding environment

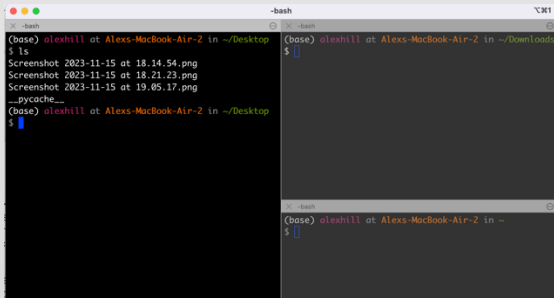
Ask peers and postdocs in your group if they have any recommendations

Check out iTerm2

Use a nice IDE



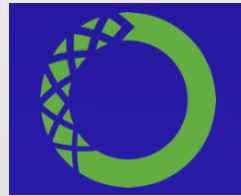
Learn and use keyboard shortcuts



## Package manager

Keep track of your various projects and workplaces using package managers

Consider learning and using conda and docker early



```
(adaptix_env) alexhill at Alexs-MacBook-Air-2 in ~  
$ conda activate py35  
(py35) alexhill at Alexs-MacBook-Air-2 in ~  
$
```

## Version control

GitHub is a must for independent and group projects (evidences and backs up work)

GitHub Desktop makes the learning curve much shallower

Buy an external hard drive as well and back up your work locally

Clean energy pioneer's lab destroyed in suspected arson attack in Liverpool

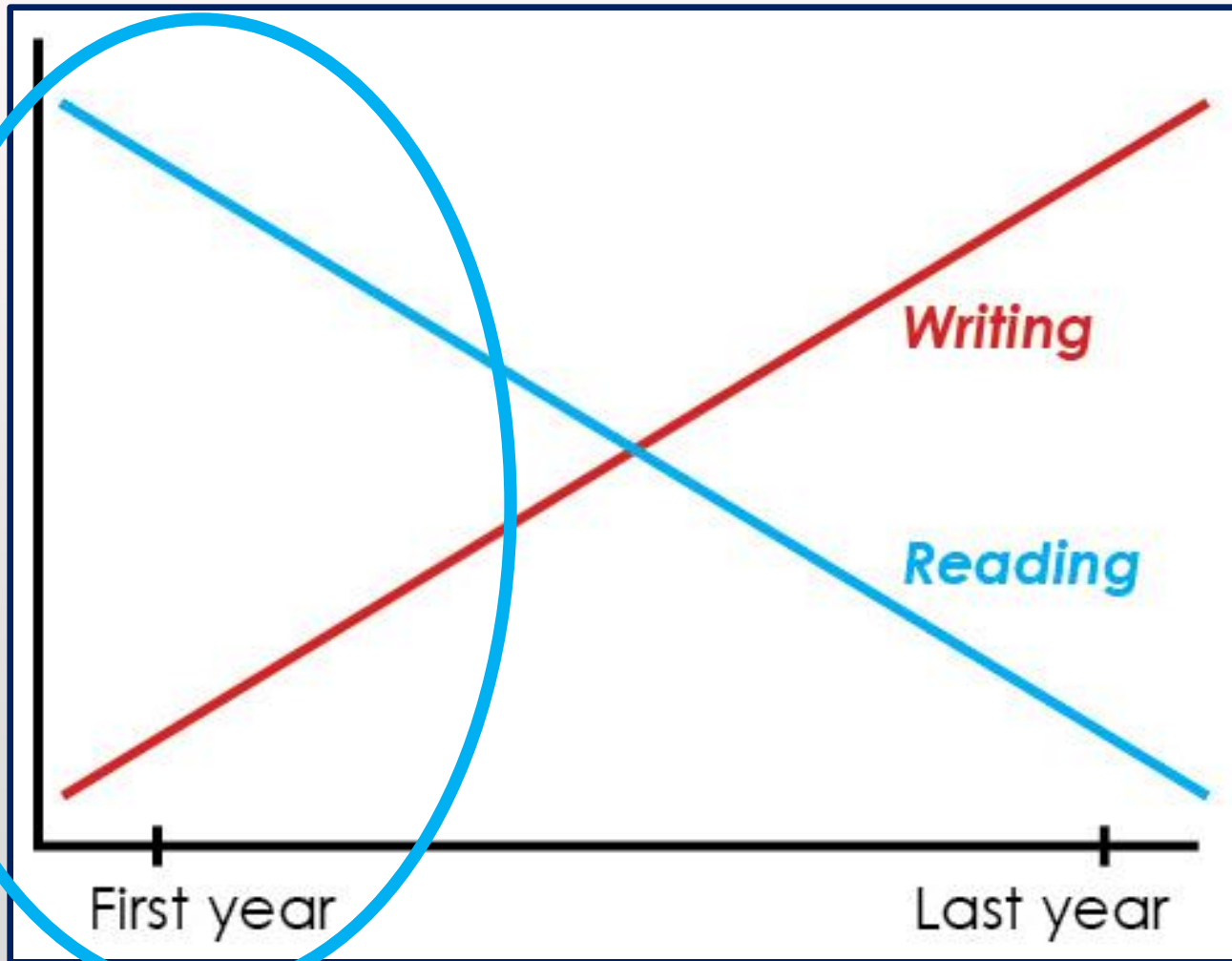
Luke Evans, whose work has been called 'breathtakingly new', says he has lost experimental data and all equipment



© Luke Evans stands among the remains of his research facility in Warriston, Liverpool. Photograph: Iain Watts/Liverpool Echo



# PhD timeline





# Paper Management Tools



Mendeley



Mendeley Reference Manager

Outline

- + Add new
- All References
- Recently Added
- Recently Read
- Favorites
- My Publications
- Duplicates
- Trash

COLLECTIONS

- AI
- BAHAMAS Halo Shape Project
- Books
- Football Association
- Geophysics
- IA with Wojtek
- Intrinsic Alignments
- Ivan and Rob Project
- Journal club
- Lecture Notes
- LJMU Application
- Pankaj
- Progenitor of MW

All References

Q Search Filters

<input type="checkbox"/>	AUTHORS	YEAR	TITLE	SOURCE	ADDED	FILE
<input type="checkbox"/>	Lamman C, Tsaprazi E, ...	2023	THE IA GUIDE: A BREAKDOWN OF INTRINSIC ALIGNMENT FORMALI...		18/09/2023	
<input type="checkbox"/>	Öberg F		Football analysis using machine learning and computer vision		15/03/2023	
<input type="checkbox"/>	OpenAI		GPT-4 Technical Report		15/03/2023	
<input type="checkbox"/>	Karimi A, Toosi R, Akha...		Soccer Event Detection Using Deep Learning		15/03/2023	
<input type="checkbox"/>	Karimi A, Toosi R, Akha...		Soccer Event Detection Using Deep Learning		15/03/2023	
<input type="checkbox"/>			View of Game Plan: What AI can do for Football, and What Football can ...		14/03/2023	
<input type="checkbox"/>	Burke C, Rashman M, ...		Addressing environmental and atmospheric challenges for capturing high...		14/03/2023	
<input type="checkbox"/>	D'Andrea M, Azzopardi ...	2022	Prospects to Apply Machine Learning to Optimize the Operation of the Cr...	IPAC 2022: the 1...	07/03/2023	
<input type="checkbox"/>	Travish G		VBo Health: Early Thoughts on AI-ML Smart Health Tracking		02/02/2023	
<input type="checkbox"/>	Jensen M, Ryan D, Apo...	2014	2013 AHA/ACC/TOS guideline for the management of overweight and ob...	Circulation	02/02/2023	
<input type="checkbox"/>			EVALUATION SUMMARY REPORT ABSTRACT EVALUATION REPORT...		02/02/2023	
<input type="checkbox"/>	Gatekeeper		GATEKEEPER-Applicants Template		02/02/2023	
<input type="checkbox"/>	Kukstas E		Update 2021/10/15		02/02/2023	
<input type="checkbox"/>	Malavasi N, Langer M, ...		On the relative effect of nodes and filaments of the cosmic web on the qu...		09/12/2022	
<input type="checkbox"/>	Eardley E, Peacock J, ...	2015	Galaxy And Mass Assembly (GAMA): the galaxy luminosity function withi...	MNRAS	09/12/2022	
<input type="checkbox"/>	Bhambhani P, Baldry I, ...	2022	Red riding on hood: Exploring how galaxy colour depends on environment	MNRAS	09/12/2022	
<input type="checkbox"/>	Yu S, Ma J	2021	Deep Learning for Geophysics: Current and Future Trends	Reviews of Geop...	23/09/2022	

# Tracking papers

## Literature Reviews

RECONSTRUCTION OF TRANSVERSE BEAM DISTRIBUTION USING  
MACHINE LEARNING

ANDREW XU

Table of Contents	
Template (★) .....	2
Important Ideas .....	3
Most relevant sources of literature .....	4
<b>Year 1 (2023 - 2024) .....</b>	<b>5</b>
<b>Existing work on Optical Fiber Image Reconstruction .....</b>	<b>6</b>

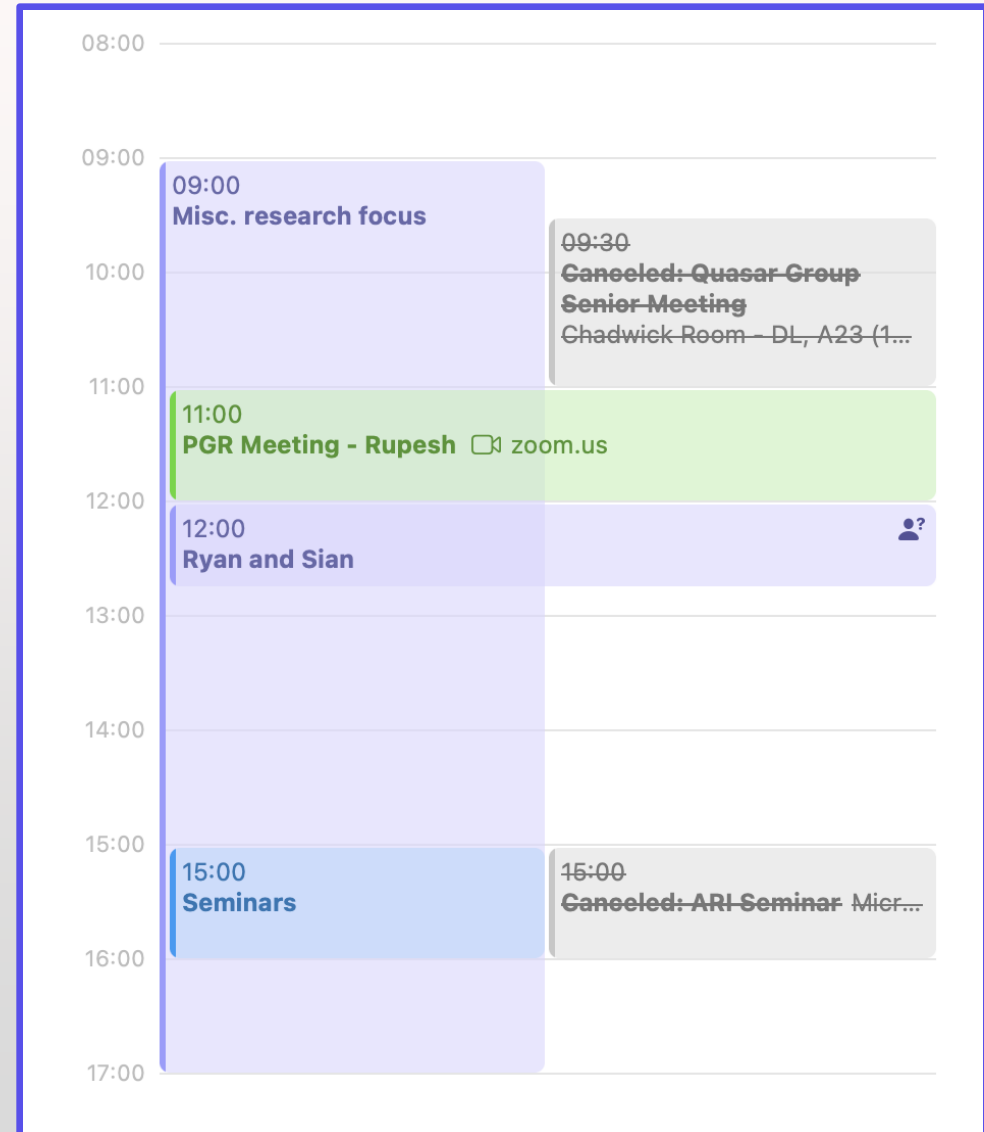


Credit: Qiyuan (Andrew) Xu



# Time management

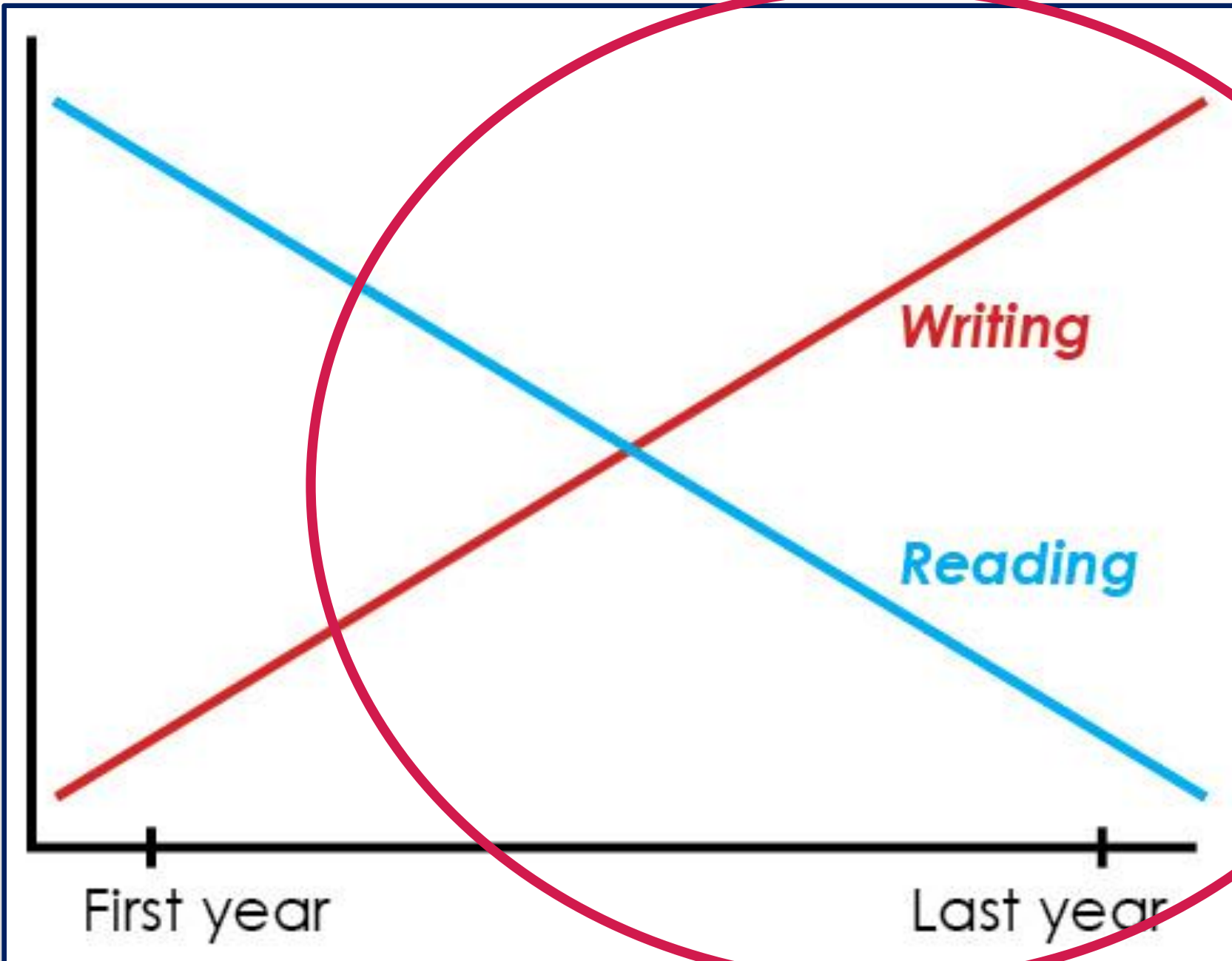
- In a PhD you will likely have a lot of commitments
- Make use of a calendar (e.g. Google, Apple)
- Set time aside for working on certain projects



# Avoiding Multitasking

- Set timers for working on certain tasks
- Don't be afraid to mute your notifications for a short time
- Consider what's urgent and important
  - Caveat: don't leave things for too long
- Set a checklist at the start of the day and update it when new tasks come in

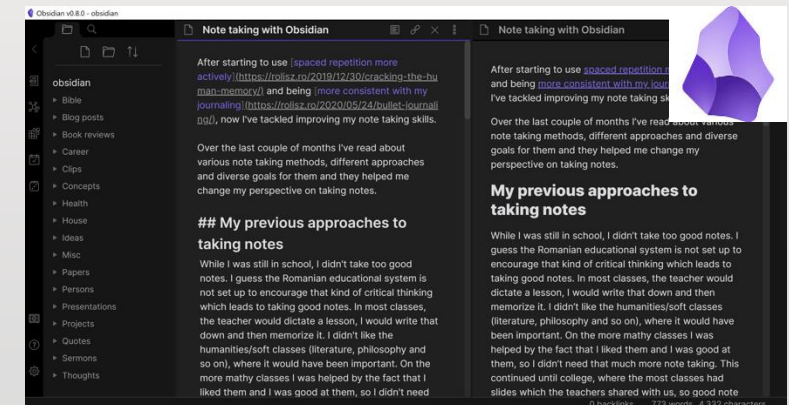
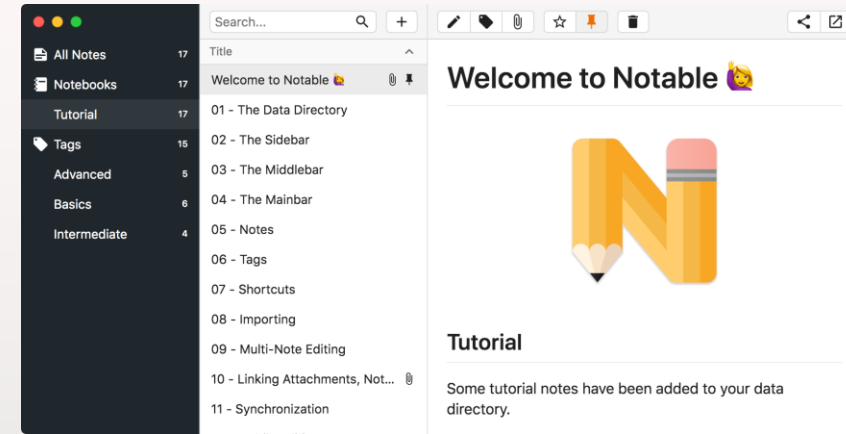




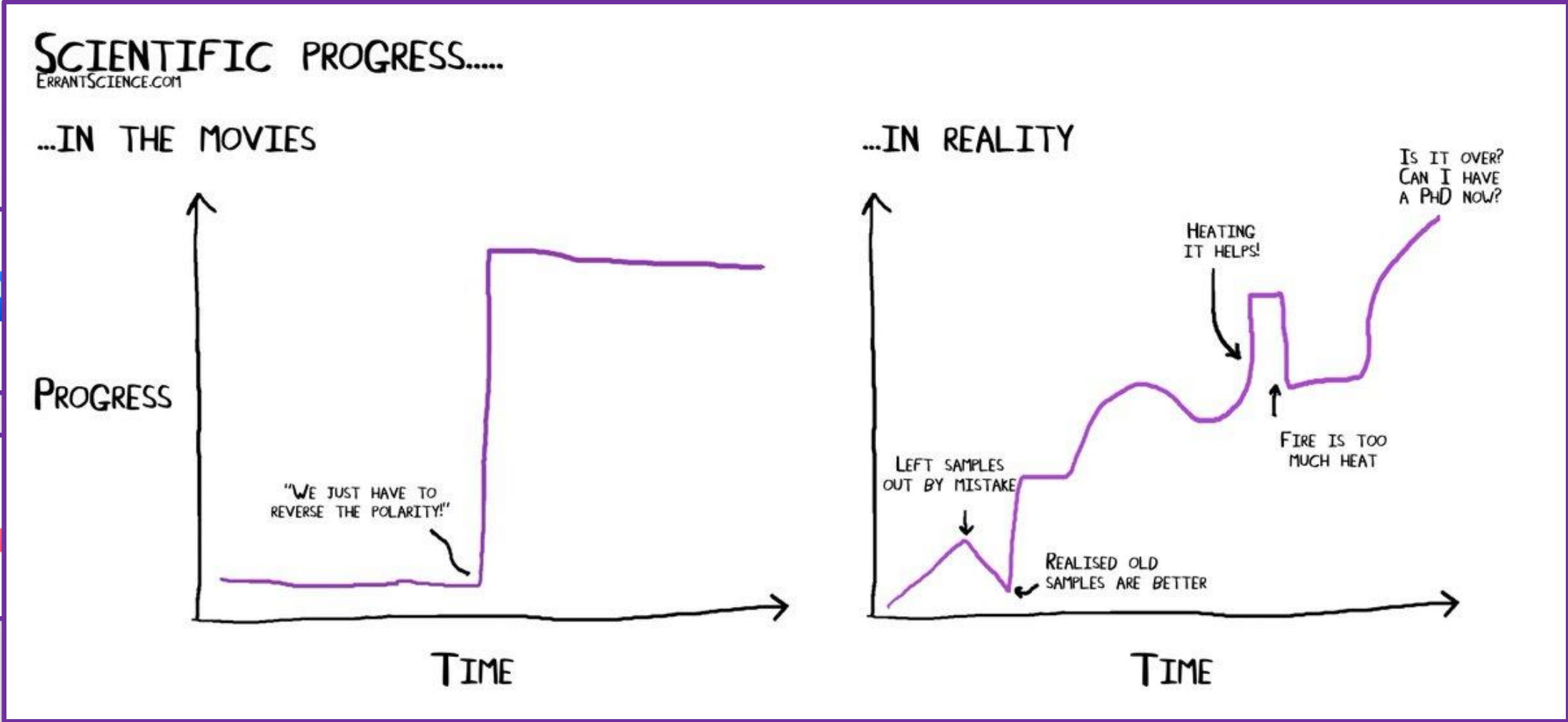


# Keeping track of work

- It's easy to get lost in daily tasks, keep track of your progress with something as simple as an online google sheet
- This helps your work focused, and makes project updates easier
- When it feels like you aren't making progress, you can see all the work you have actually done
- You can also use apps like Obsidian and Notable

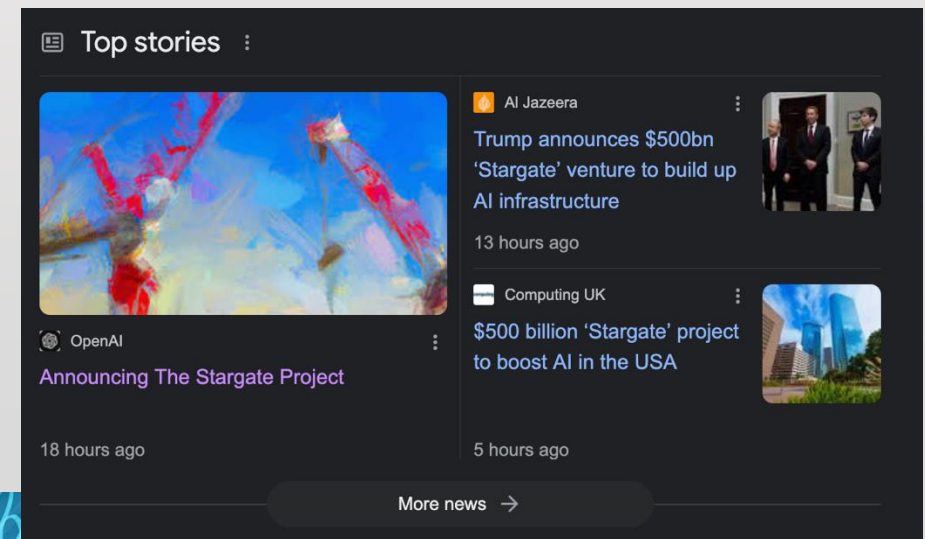


# Project Management



# Artificial Intelligence

- AI is and will be a huge part of your PhD and future careers. Become an expert in using it well
- It can be an excellent tool, and a hinderance to your personal growth
- If it's free, you're the product
- Speak with your supervisors/research leads to determine if there are any policies in place limiting its use
- Consider the carbon cost of using AI
  - Estimates vary, but a ChatGPT search could use 50-100x more energy than a Google search
- Be wary of hype





# Artificial Intelligence Tools

- Literature review (see most recent LIV.INNO Data Science Seminar – pfd,app)



- Paper summarizing

- Idea generation (next month's seminar)



- Writing assistant

- Data analysis



- Research assistant – multi-agent systems to analyse vast datasets



# Positive work environment

- Seek or create positive communities
- Attend departmental activities
- Take part in social events
- Welcome opportunities to give and receive peer feedback
- Find networks and activities of people with your background or research interests

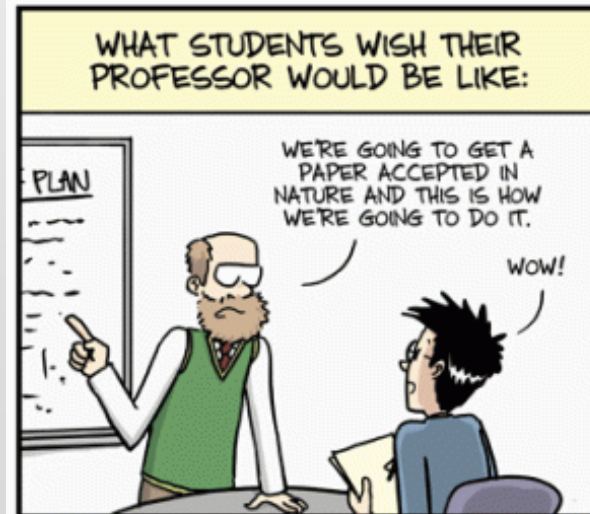


# Supervisor Relationship

- Each relationship is unique and depends on the personalities and the project
- Supervisors are there to support you
- Supervisors will guide you, but don't expect direct instruction
- Supervisors aren't thinking about your project as much as you are



www.phdcomics.com





# Supervisor relationship

What do supervisors expect from their students?

- Independence
- High standard of writing
- 'Regular' meetings
- Honest reporting
- Advice will be followed
- Positive scientific discussions

What do students expect from their supervisors?

- To be supervised
- Be available
- Read work in a timely manner
- Be engaged in their research
- Help get them a job at the end!

# Supervisor meetings

Use these conversations to:

- Outline progress
- Highlight any issues
- Set/revise expectations

Be proactive! Especially if you have large supervisory teams. Decide who you would like to see and send an invite

Ahead of meetings, consider providing a brief summary of your work

Provide context for your update at the start of the meetings

Write up a quick summary after the meeting

Communicate your needs – is the level of contact working for you?



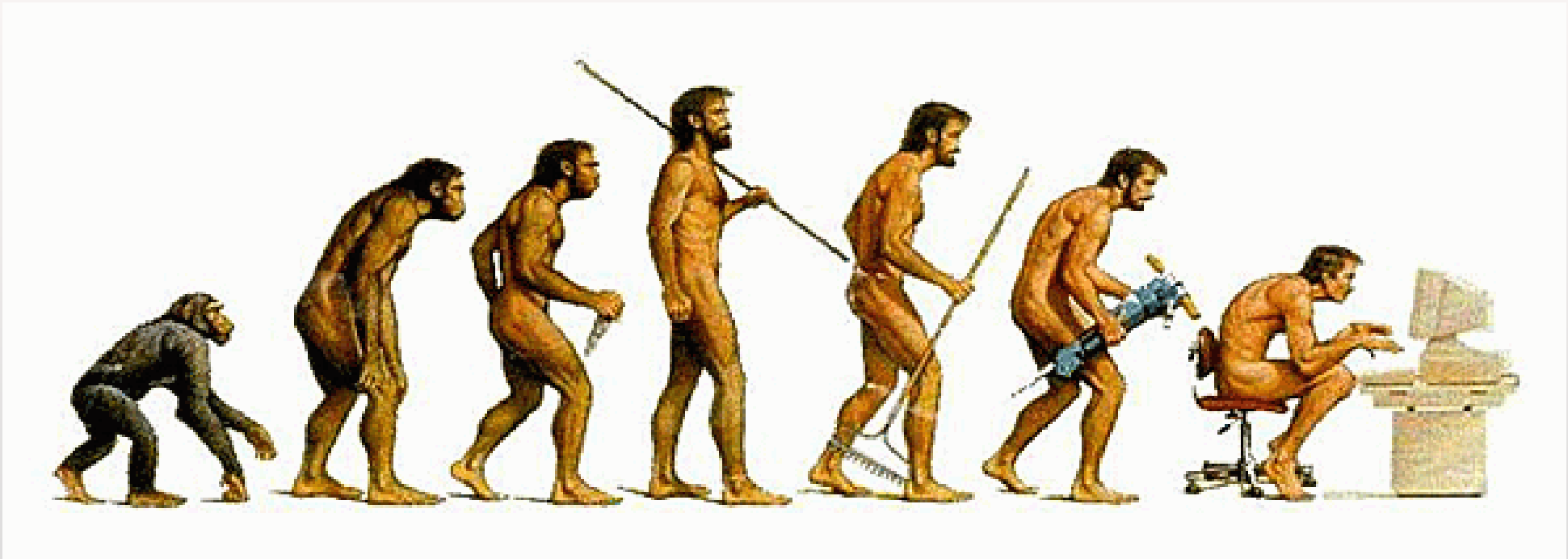
# Supervisory teams

- Second supervisors and postdocs in your group are really important
- If you feel like something isn't right in your relationship with your supervisor, communicate it early with them first, then with the wider team to get their perspective





# Staying healthy



# Staying healthy



- Stay still
- Mess around with your sleep
- Maximise your screen time

# Staying healthy

- Develop hobbies and friendships outside of academia



- Leave work at work

- Eat (mostly) healthily

- Take breaks (during the day and holidays)





# Celebrate accomplishments





# Long term: what are your expectations from your PhD?

- Job in academia? Job in industry?  
Follow your passion? Get the Dr title?
- Discuss your long term goals with your supervisor every few months
- Take stock of where you are right now, and adapt your medium term plans to help you achieve your goals (Career Development Plan)



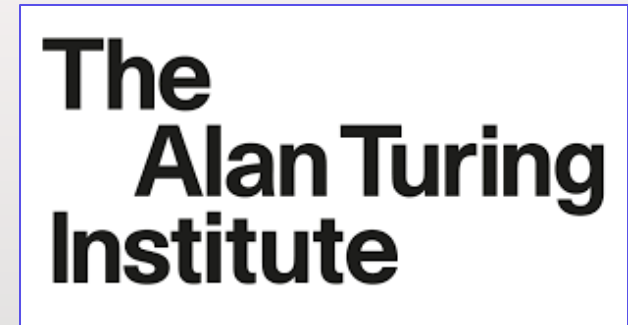
# Be your own advocate

- People will help you, but you are responsible for your own development
- Put yourself out there, seek mentors, build your network, promote your work
- Become a member of your community
- Hear about opportunities first, be in the room where it happens



# Training opportunities

- A PhD is a great time to be developing transferable skills
- In data science there is a LOT of free online material
- Try not to overload yourself, start training schemes you know you'll have time to finish
- Pick a placement to fill a gap in your CV



# Paper planning

- In your ~2nd year, start thinking about what your paper title would be
- Draw up a rough wishlist of results in overleaf
- Work towards filling out this paper
- Revise aims as needed
- Set time aside for writing
- Seek out or create writing groups

The screenshot displays the Overleaf web editor interface. On the left, a file explorer shows a project named 'frog.jpg' containing 'main.tex' and 'sample.bib'. The central pane shows the LaTeX source code for 'main.tex', which includes package declarations, language settings, and document structure commands like `\title{Your Paper}`, `\author{You}`, and `\begin{abstract}`. The right pane shows the rendered PDF output, which includes a title page with the text 'Your Paper', 'You', and 'January 14, 2023', followed by an abstract section and an introduction section. A small image of a green frog is included in the introduction section, with a caption below it: 'Figure 1: This frog was uploaded via the file-tree menu.'



# Science communication

**Hsiang-Chih Hwang**  
@hc\_hwang

Paper day: the dynamical masses across the Hertzsprung-Russell Diagram! This is my favorite plot I have ever made 🥰🥰 In one sentence, we measure the mass of stars using @ESAGaia wide binaries + Newtonian dynamics + stats + a bit neural network 🤖 (1/13) [arxiv.org/abs/2308.08584](https://arxiv.org/abs/2308.08584)

**Figure 12.** Same results as Fig. 5, the measured dynamical masses across the Hertzsprung-Russell diagram. Here we highlight several interesting masses in the diagram.

**Alexander Hill** · You  
Data Science Fellow  
5mo · 🌐

Last week we launched WATMO, an STFC-funded collab between 4wardFutures and the University of Liverpool! ...see more

👍❤️👍 34      2 comments · 6 reposts

👍 Like    💬 Comment    ↻️ Repost    ➦ Send

📊 1,977 impressions      🔍 View analytics

**Physics Plot of the Week**  
@PlotPhysics · Follow

Vote for the new "physics plot of the week"

-- Plot from Elbers et al.  
-- Plot from Yulin et al.

4:45 PM · Jul 8, 2023

👍 35    💬 Reply    🔗 Copy link

📖 Read 1 reply

# Outreach

- Great for tailoring science communication
- See your work through fresh eyes
- Share your journey and advice with young people



# Activity: what's worked for you?

- Discuss in groups what challenges you have found in the day-to-day routine of working as a PhD student, and what have you done to address this?
- What other tips can you share?

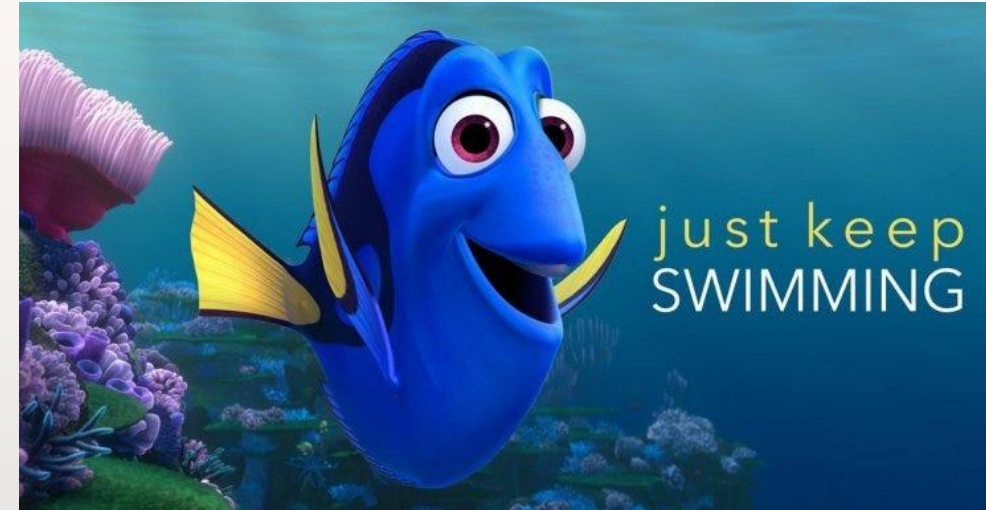
# Final thoughts





# Final thoughts

- A PhD is what you make of it
- You deserve to be here
- Ask for help and give it to others
- Focus on your health, keep things in perspective and you'll be ok



# Additional Resources

- <https://the-turing-way.netlify.app/index.html>
- <https://blogs.lse.ac.uk/studentsatlse/2023/05/21/managing-your-phd-without-burning-out/>
- <https://scribblygumblog.wordpress.com/2017/05/23/managing-expectations-the-arranged-marriage-between-supervisor-and-student/>