



**Abstract and concrete**

**ADVICE**



**for PhD students**

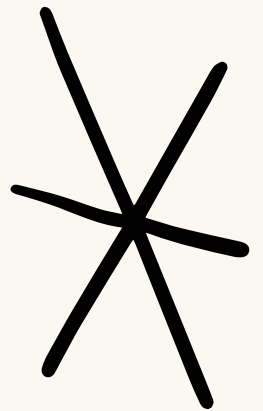
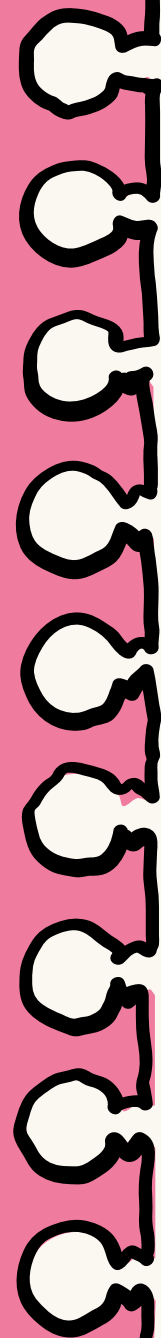
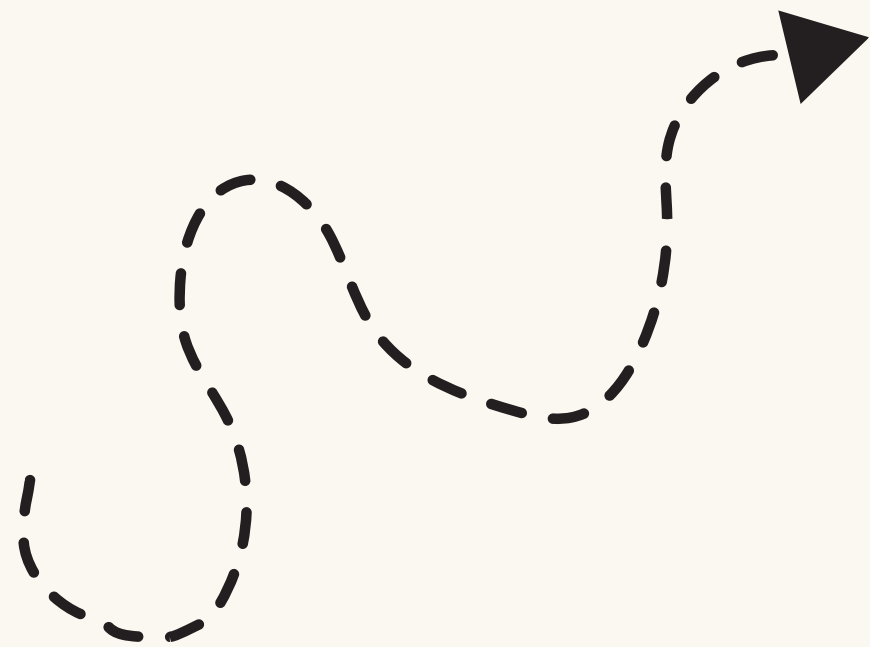




**Today**

**I. 10 things you should do  
but your advisor might  
never tell you**

**II. Resources for PhD  
students**





# 10 THINGS

you **should** do



**but your advisor might never tell you**

# 10 Things

**Write early**

**Celebrate wins**

**Read papers**

- NOT line by line

**Find your way**

- Maths
- Organization

**Don't feel dumb**

- Stand up against your ignorance
- We all feel dumb

**Manage time**

- Research is unefficient

**Accept imperfection**

- Bad things will happen

**Keep motivated**

- Values
- People

**Send emails**

**Go conferencing**

# 1. Find your way



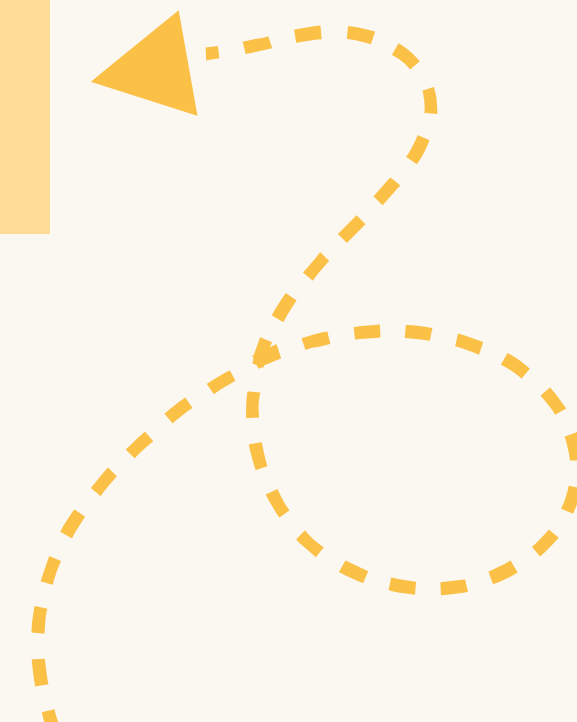
## \* Independence

*If a topic does not work out,  
look for something else.  
Your advisor might not  
always give you solvable or  
interesting problems*

**MATH**  
Details vs big  
picture

**ORGANIZATION**  
Paper vs  
latex, **time**,  
etc

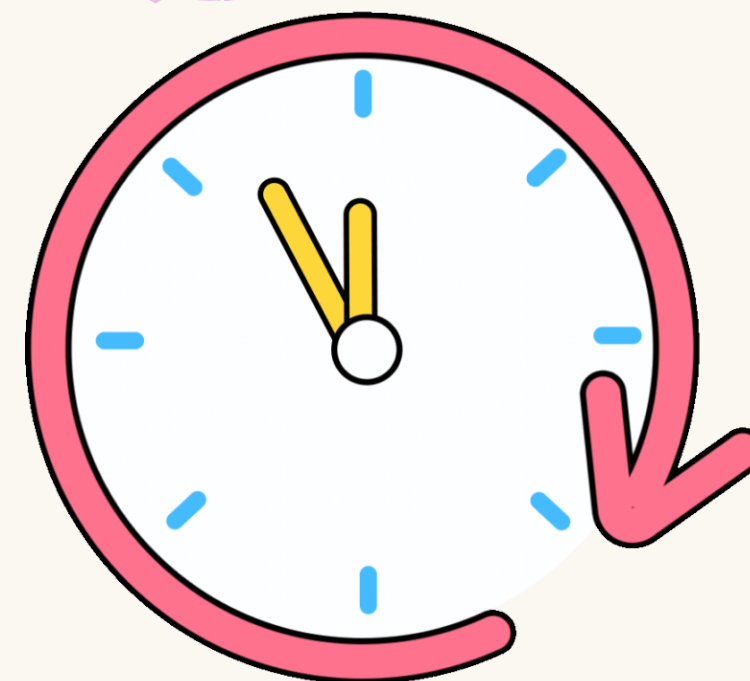
**MORE IN  
PART II**



## 2. Manage time

### \* Research is unefficient

**Things take time... but do not stick to something for too long**



*Don't spend too much time on a problem you don't know the difficulty of.*

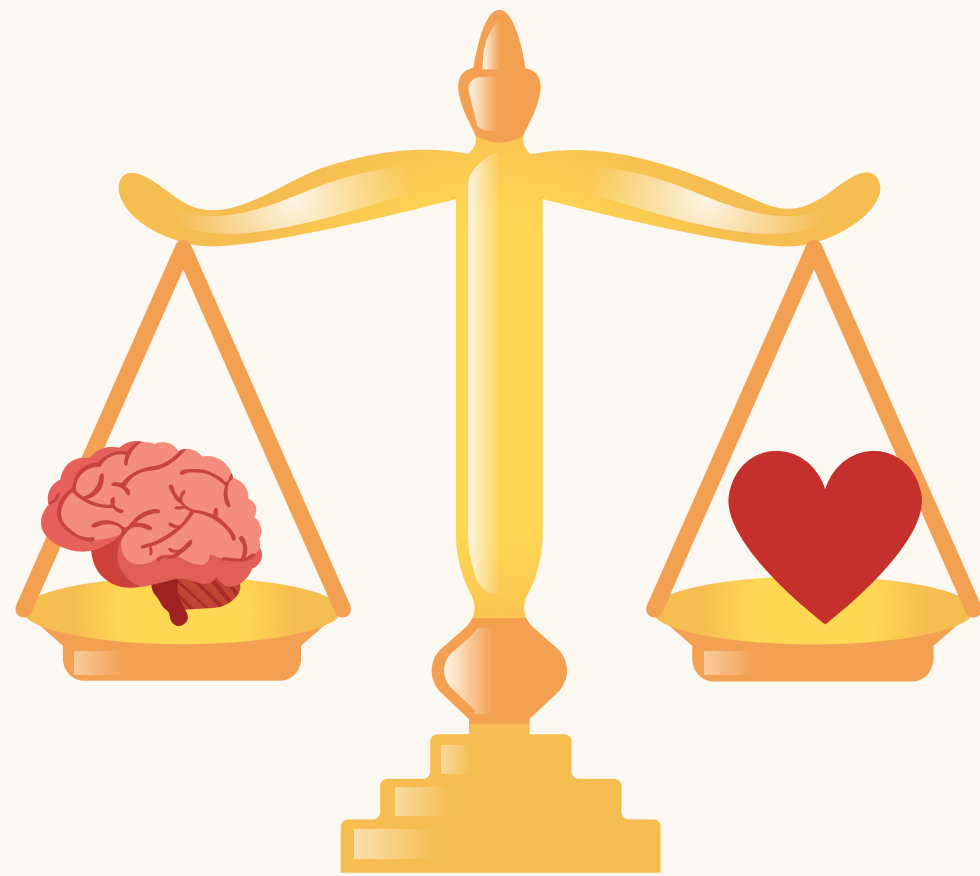
*It could happen that the problem is way too hard but you don't see it right away*

*Be pragmatic.  
I'd try to produce small generalizations to get some feelings about how to do research first before moving on to more general questions.*

*One thing I personally struggled with is that I spend maybe too much time on a small problem instead of maybe skipping ahead to a bigger problem.*

## 2.5 Work $\subseteq$ Life

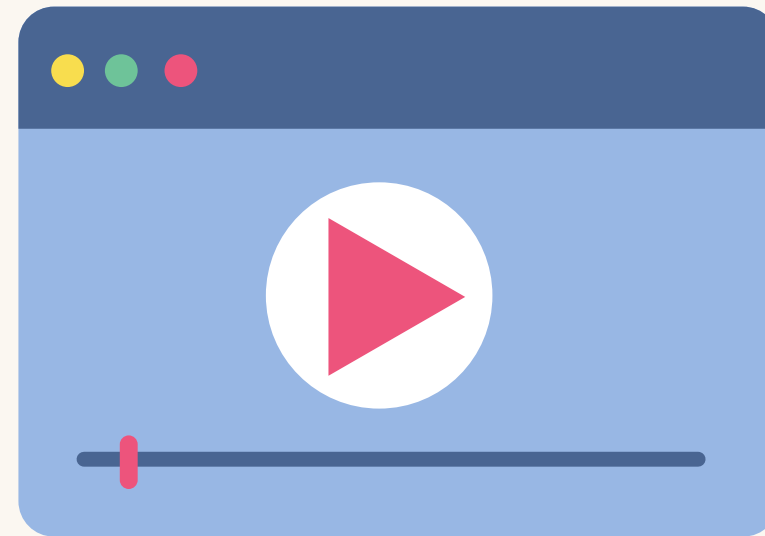
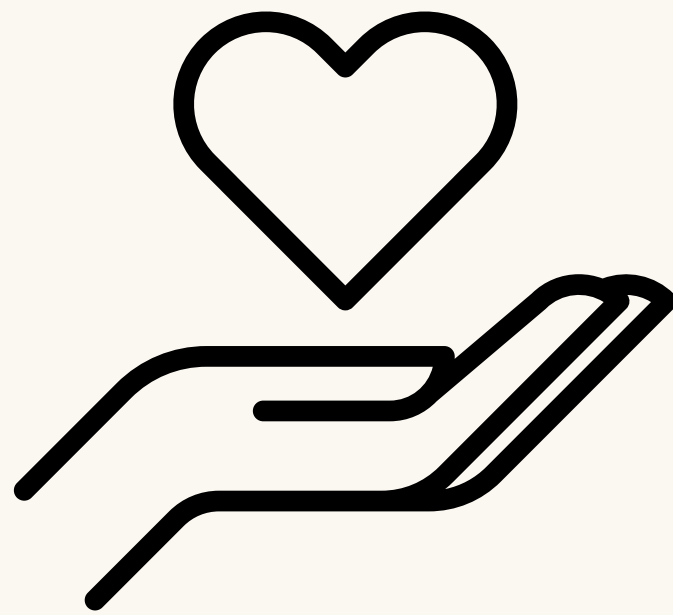
### \* Clear boundaries



*You're kind of "working for yourself" in a way, and one tends to have loose rules regarding work. However, 3 or 4 years is too much of a long time, and one cannot keep having an unstructured day for so long. In my opinion, it is important to find activities to do in the evening and on the weekends*

# 3. (Find out how to) keep motivated

\* Values



\* Applications/outreach

*I like to read blogs (and sometimes podcasts) about Math. It's usually not directly related to my research, but it keeps me motivated to continue with my projects.*

\* People





# 4. Go conferencing

*In hindsight I should have gone to some other university for a month or a semester*



***Even if you don't give a talk.***  
*Ask your advisor for the first conference or google. Then you can **ask people** about which conferences are coming up.*

*Attend conferences and talks. For me, it has been a great way of **learning** about other topics and **connecting** with people, which can stimulate one's productivity.*

*it is important to see different experiences, other ways of living, other people struggling for the same reasons and for different reasons. I always came back much more **motivated** after attending some conference.*

# 5. (Dare to) send emails



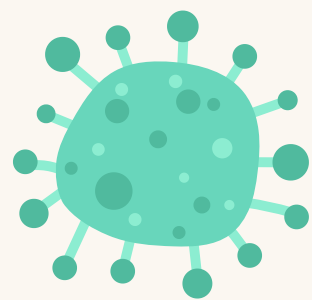
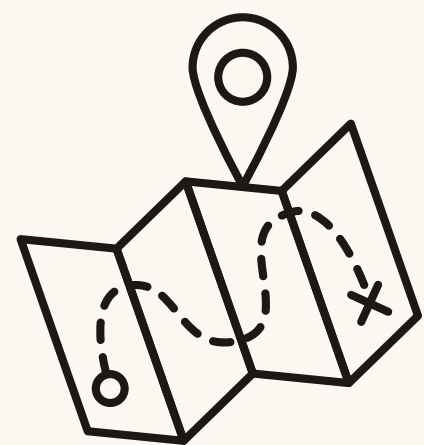
*Should I send an email asking for...*  
*-a conference invitation*  
*-a meeting with someone ...?*  
*Always YES*

*Its better to email the author if the paper if something is not clear rather than spend months trying to make sense of their theorem. If I had known this sooner, *I would have* saved a lot of time*

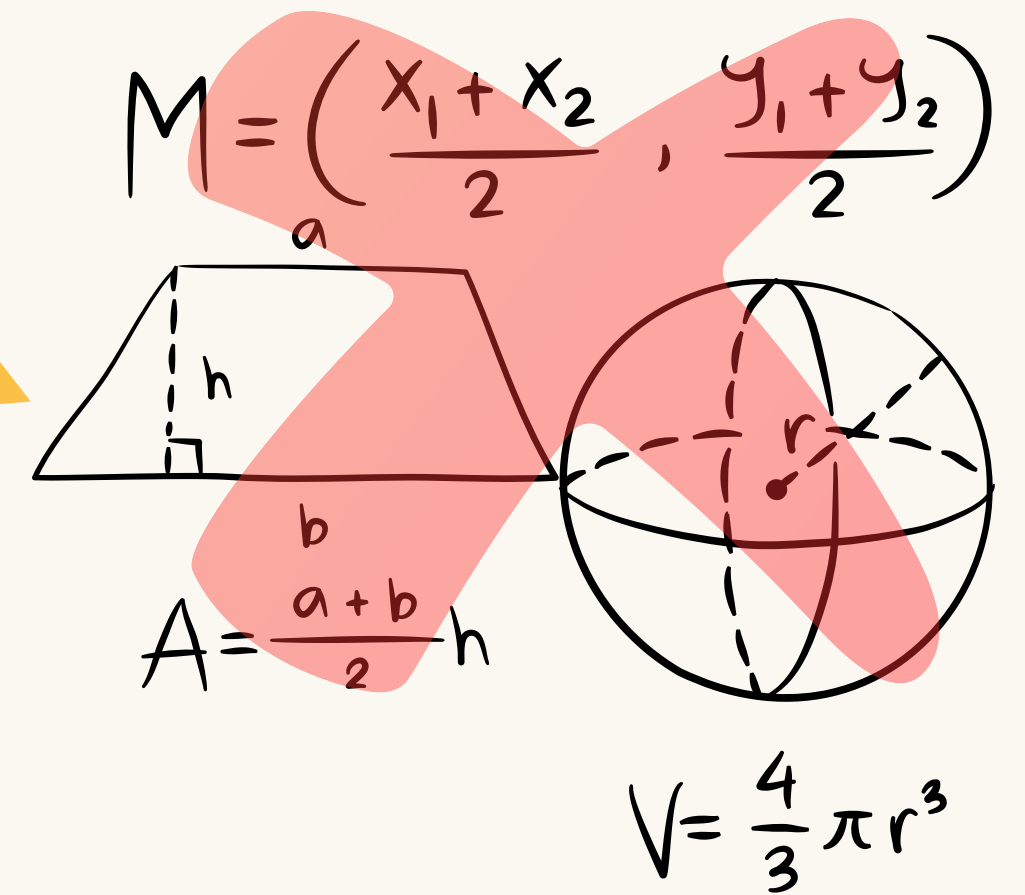
# 6. Accept imperfection

\* Bad things will happen

Do what you can



*Your project could have been done in the 70's, there is a new paper that proves your project result and more, the paper you're writing could break in the last line, after a year you realize the problem is way to hard, etc*



*There will be tough moments: you will find a mistake on a proof that you thought it was complete, you won't see the light to close a project on time for your applications.*

# 7. (Try to) not feel dumb



\* **We all feel dumb**

\* **Stand up against your ignorance**

*I often thought if I don't understand certain concepts then I'm not qualified as a PhD student. Simply ask your supervisor whenever you don't understand. I have to admit that I felt ashamed to ask my supervisor seemingly easy questions.*



# 8. (Find and) read papers

\* **DON'T read line by line**



# 9. Write early



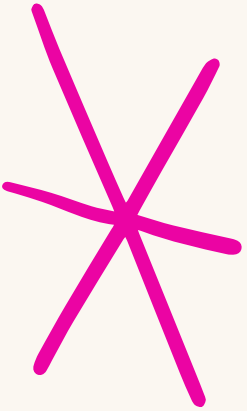
\* **Just do it**

*Type things as soon as possible. I discovered that there were many details that weren't completely justified when I was typing my thesis and that I didn't notice when I was just writing notes*



# 10. Celebrate your (small) wins





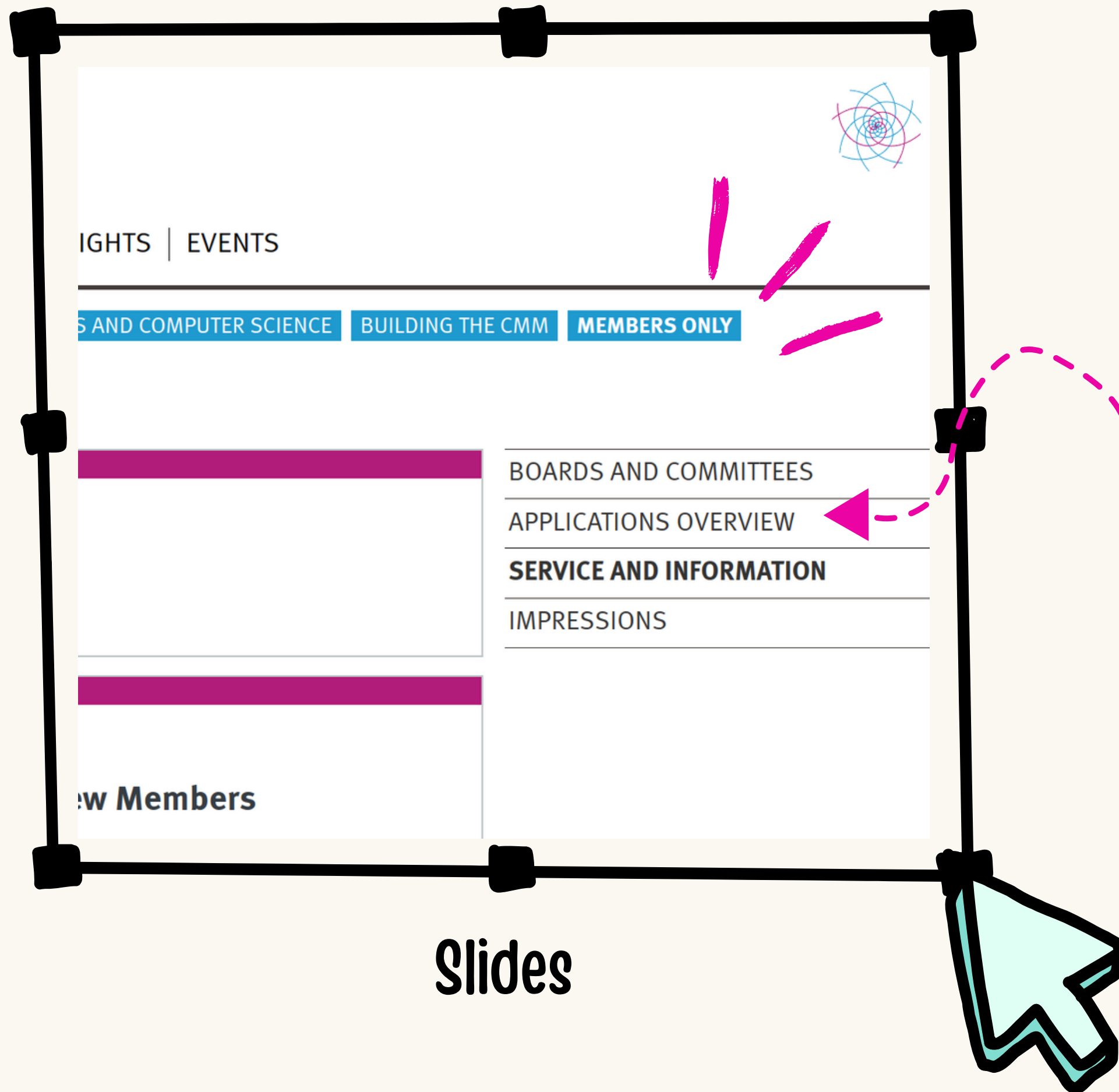


# RESOURCES

for PhD students

...revisited





RIGHTS | EVENTS

S AND COMPUTER SCIENCE | BUILDING THE CMM | MEMBERS ONLY

BOARDS AND COMMITTEES

APPLICATIONS OVERVIEW

**SERVICE AND INFORMATION**

IMPRESSIONS

ew Members

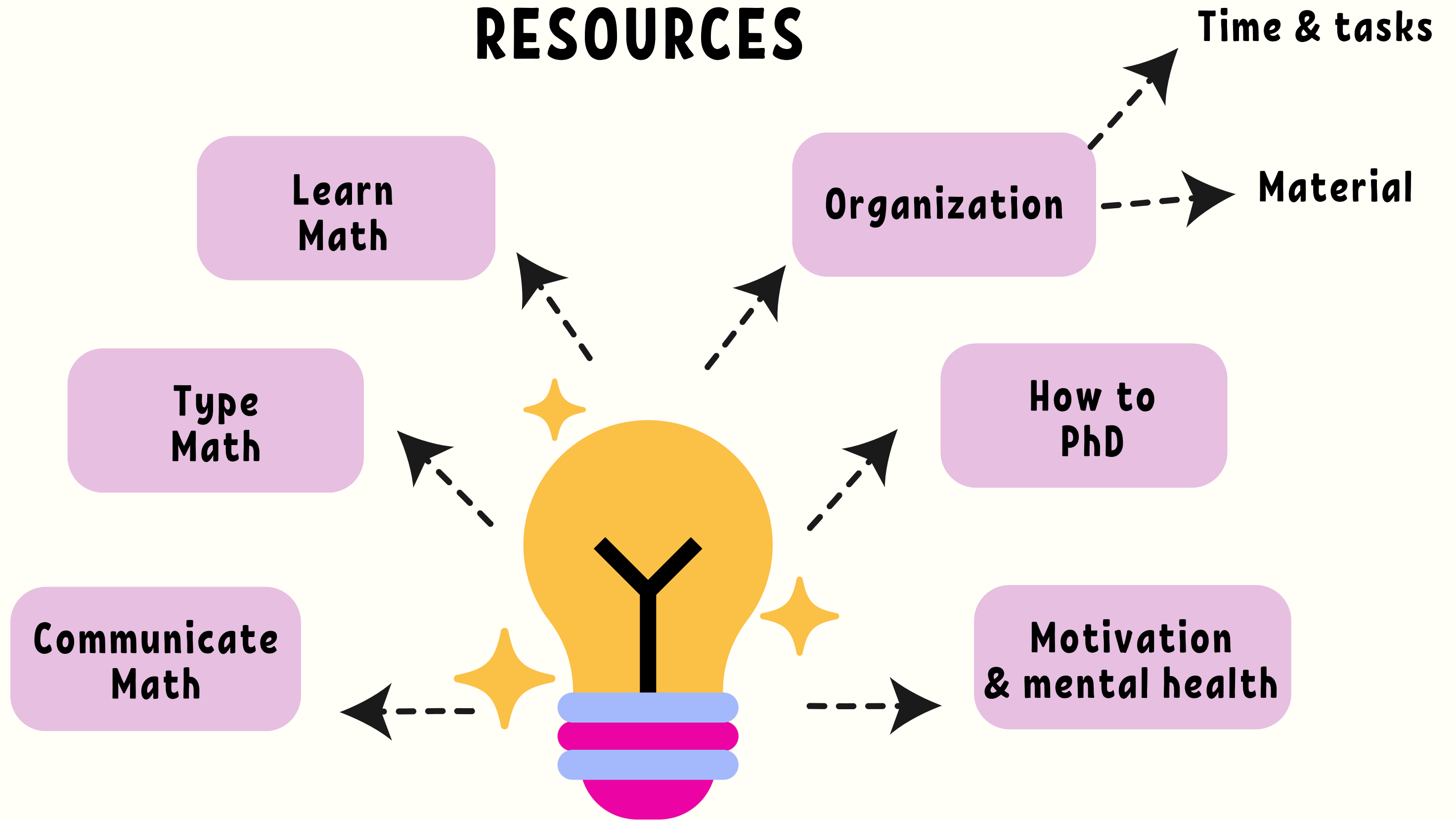
Slides

**Scroll down to:  
Early Career  
Researchers /  
Useful Resources**

## Philosophy of this talk

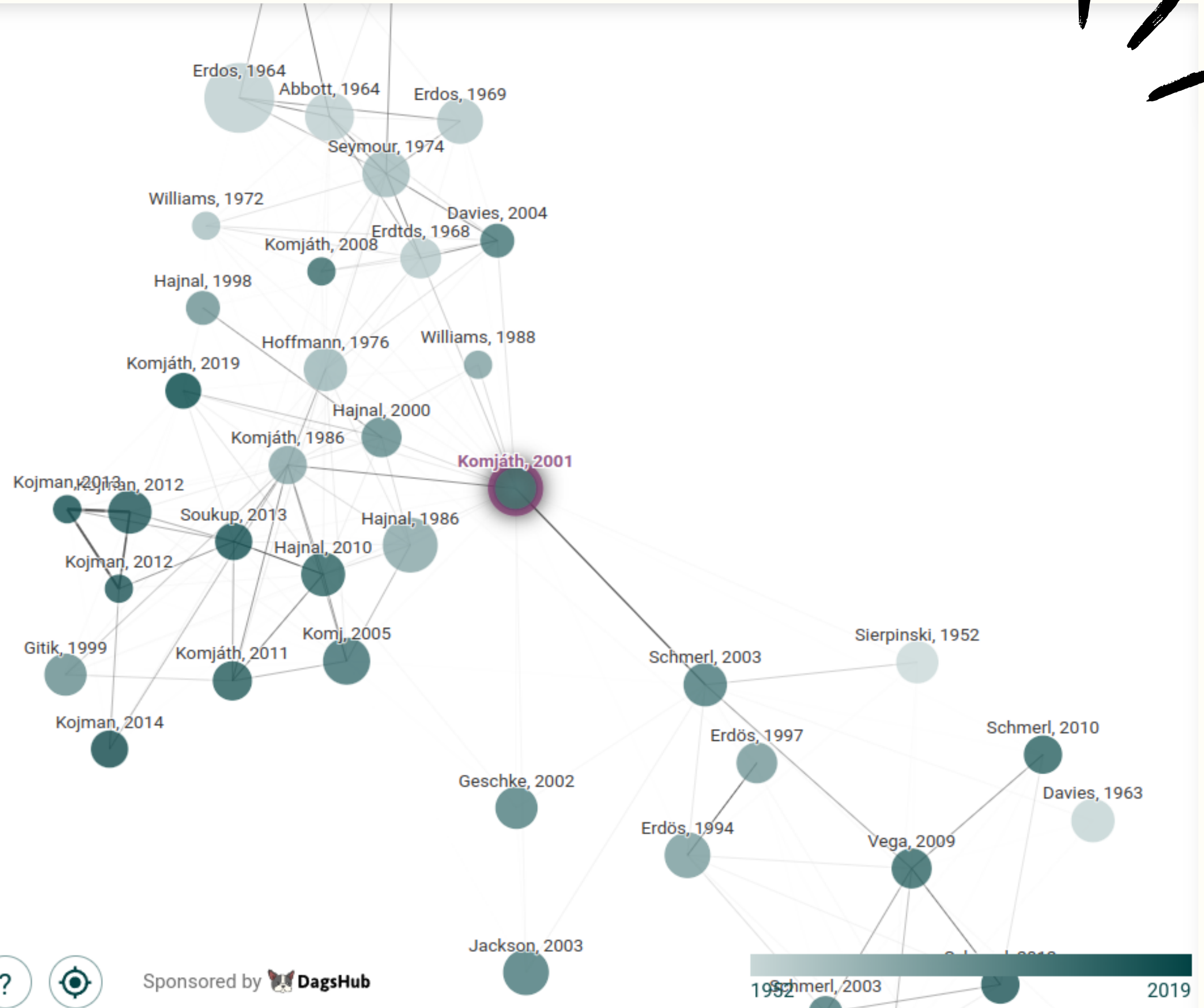
- PhD is difficult enough so don't try to reinvent the wheel.
- Things are too hard already, get help! **Directly or indirectly.**
- Many answers are just out there!

# RESOURCES



# Learn Math

- 1 ArXiv (mailinglists)
- 2 MathOverflow & Math StackExchange
- 3 **Connected Papers,** MathSciNet
- 4 Coursera, Youtube
- 5 Blogs



# Type Math

1 LaTeX

2 Mathpix, deTexiFy

3 Lyx

4 Grammarly

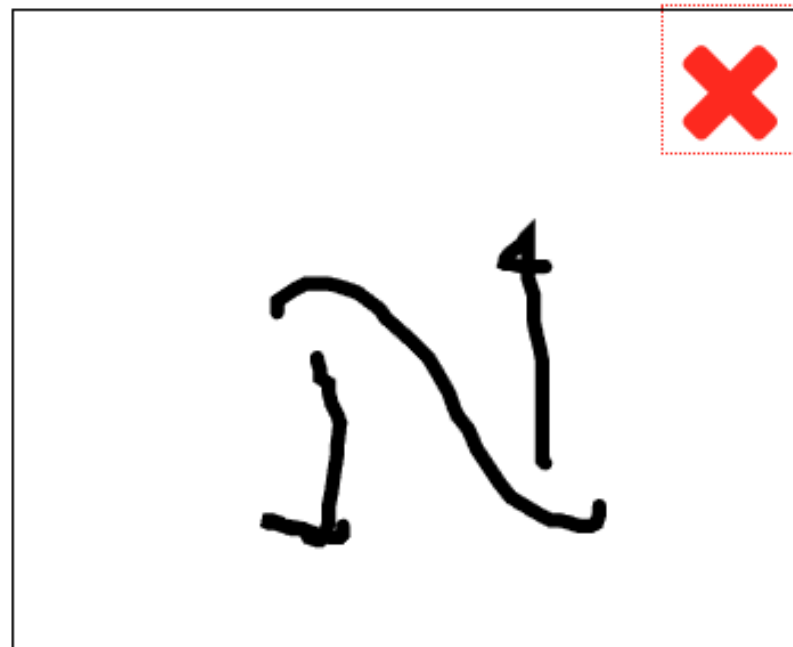
$$H := \text{HOD}_{A \cup \{A\}}^{L[g]}$$

where  $g$  is  $\mathbb{C}(\omega)$ -generic over  $L$ , and  $A = \{C_n : n < \omega\}$  is the set of Cohen reals added by  $g$ .

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where  $g$  is  $\mathbb{C}(\omega)$ -generic over  $L$ , and  $A = \{C_n : n < \omega\}$  is the set of Cohen reals added by  $g$ .

## Detexify



Score: 0.23012784732020758

`\aleph`  
mathmode



Score: 0.24142438766384633

`\usepackage{ upgreek }`  
`\uppsi`  
mathmode

# Communicating

- 1 Mathematical Writing
- 2 How to give a good talk
- 3 How to write Math
- 4 Ask people

How to maximise the chances of your message getting across (1/3)

Tell a good story

.....but make it a good *maths* story.



Crustacean style

- ▶ structure on outside.
- ▶ good for maths talks.



Vertebrate style

- ▶ structure hidden inside.
- ▶ good for detective stories.



Everything by date What should I read? 2 more...

2 sorts Related to Research quest...

Article 51

- Hilbert spaces without countable AC October 12, 2023 Blackadar Farah Karagila
- Borel circle squaring September 7, 2023 Marks Unger
- Unit sphere fibrations in euclidean spaces September 7, 2023 Asimov Frick Harrison Pegden
- Topological partitions September 7, 2023 Bankston McGovern
- How to Tee a Hyperplane August 31, 2023 Rosen
- Decomposing the real line into everywhere isomorphic suborders June 21, 2023 Ervin
- Intermediate Submodels and Generic Extensions in Set Theory June 20, 2023 Grigorieff
- Three-point sets
- No n-point set is  $\sigma$ -compact
- A Four-Point Set That Cannot Be Split

Load more

New

**Actions of the day**

Octo  Finish MM-connect talk

Octo  Send receipts travel

Email Prof.

---

Later this week

Type transc degree step 1

# Organize

- To-do lists, calendar
- Tasks/project managers
- Forest, Pomodoro
- Reference manager
- Tag/folders for your notes



Eva O. L. Lantsoght

# The A-Z of the PhD Trajectory

A Practical Guide for a Successful  
Journey

## How to PhD

- 1 **The A to Z of the PhD Trajectory**
- 2 **PhD and Productivity**
- 3 **How to PhD (podcast)**
- 4 **The illustrated guide to a Ph.D.**

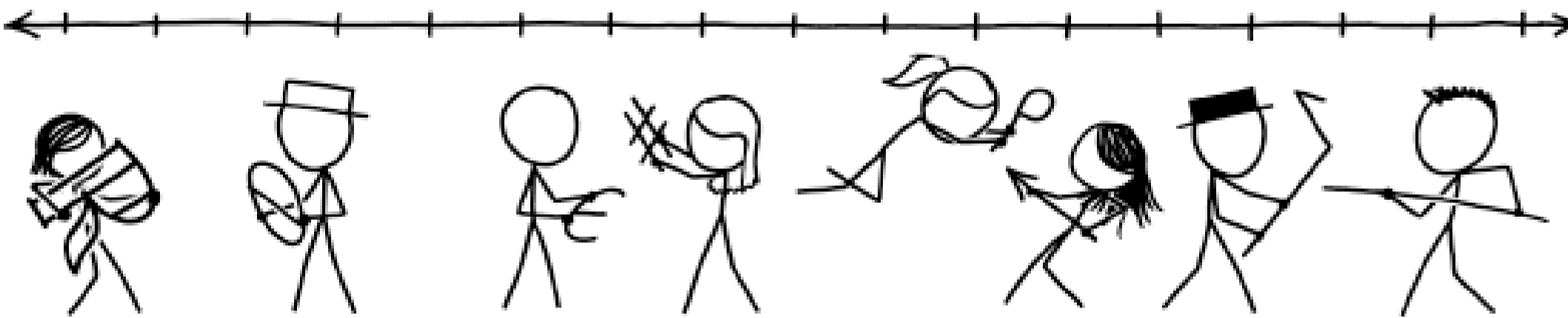
# MATHEMATICAL SYMBOLS

BY HOW USEFUL THEY WOULD BE IN A FIGHT

MORE USEFUL  
→

$\mathbb{R}$   $\emptyset$   $>$   $\alpha$   $\pi$   $+$   $\psi$   $\sim$   $\Rightarrow$   $\Gamma$   $\sqrt{\int}$   $\perp$

$\theta$   $\infty$   $U$   $\in$   $\forall$   $\partial$   $\neq$   $\#$   $\Delta$   $\xi$   $\times$   $\rho$   $\int$   $\int$   $\perp$



## Motivation

- 1 Math memes
- 2 Talking with people
- 3 Overcoming the second year slump (slides)
- 4 Books, blogs

Managing Your  
Mental Health  
During Your PhD

THE  
THESIS  
WHISPERER

—PEGGY ORENSTEIN

**Burnout**  
THE SECRET

A blue, torn-edge paper graphic with a folded bottom-left corner. It features three pink brush strokes on the left side and two black diagonal lines on the right side.

**THANK YOU**

