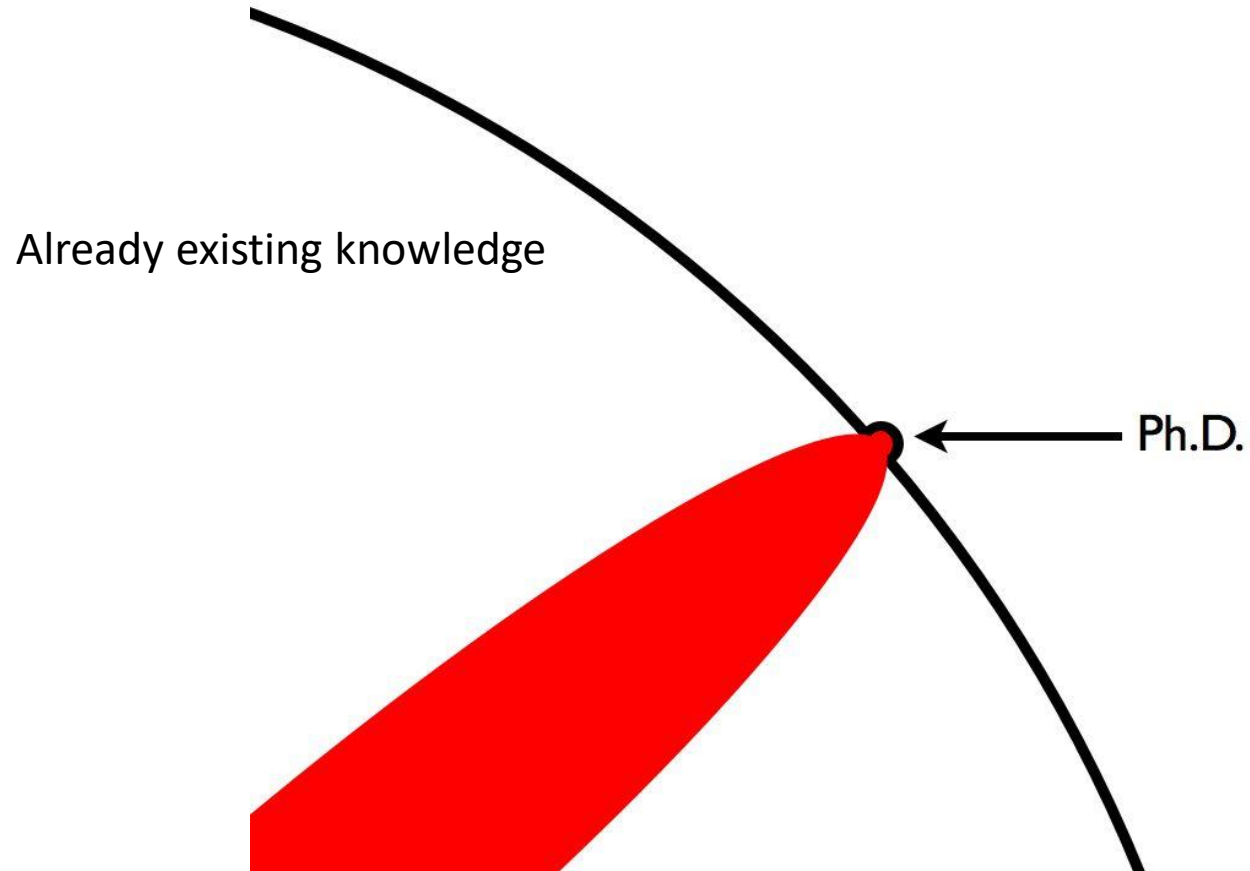


Wei-Neng Hsu, 徐煒能
Paul Scherrer Institute, Switzerland

Why a PhD ?

What does a PhD thesis actually do ?

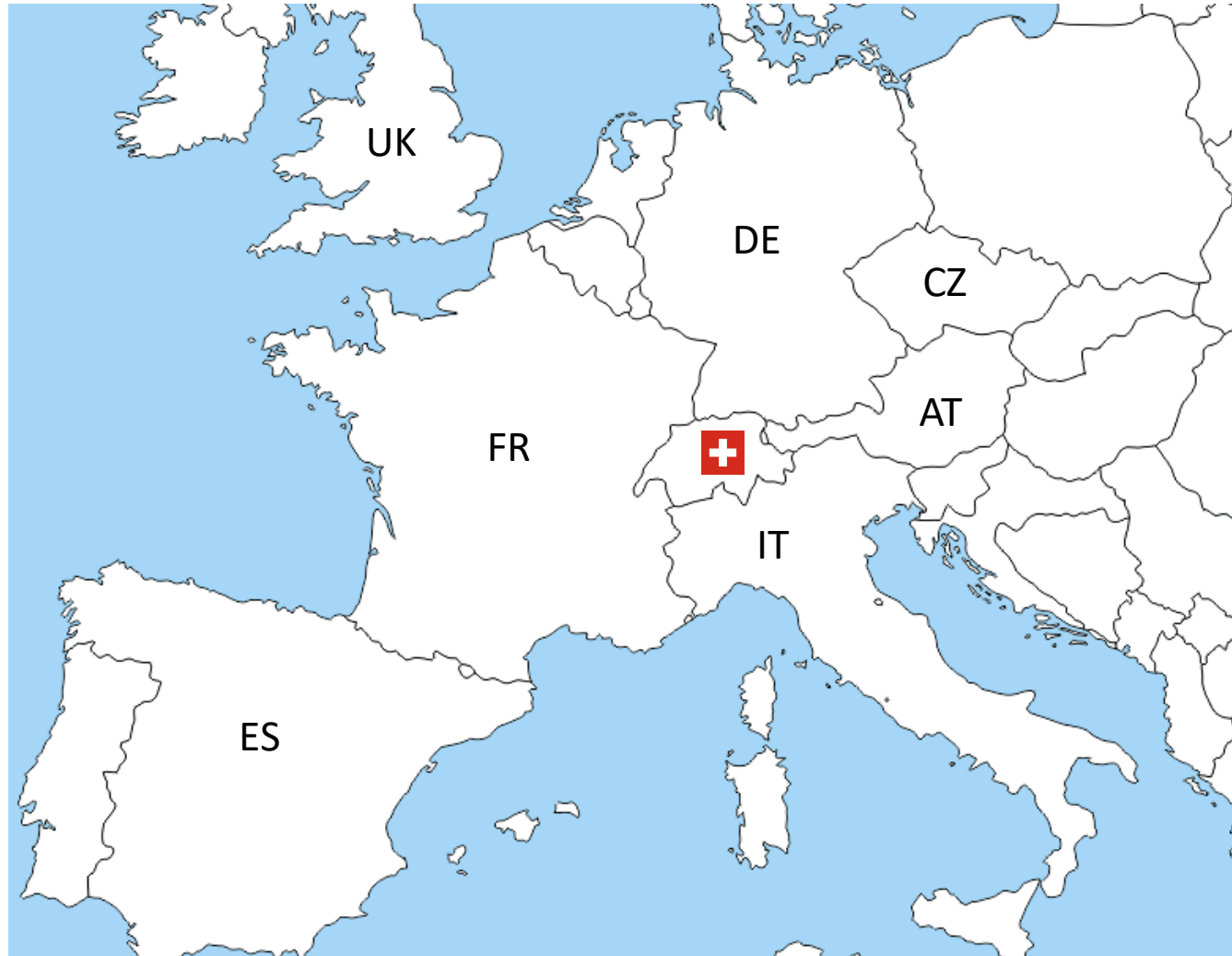


For my love of science ?
For a better job ?
For a new challenge ?

Apply for a PhD

- Where?
- Figure out different systems: US? UK? French? Germany? Japan?
- Which field?
- Which school?
- Which group?
- **Spend enough time to gather information**
- More than browsing on the internet
Ask people for information !!!

PhD study in Switzerland



PAUL SCHERRER INSTITUT



Matter and materials
Energy and environment
Human health

Swiss Spallation Neutron Source
(SINQ)

Swiss Light Source (SLS)

Swiss Hard X-ray Free Electron Laser
(SwissFEL)

Swiss Muon Source ($S\mu S$)

High-Intensity Proton Accelerator
(HIPA)

Proton therapy center

<https://www.psi.ch>





École polytechnique fédérale de Lausanne



Advanced Manufacturing
Biotechnology & Bioengineering
Computational and Quantitative Biology
Civil and Environmental Engineering
Chemistry and Chemical Engineering
Electrical Engineering
Energy
Computer and Communication Sciences
Mathematics
Mechanics
Microsystems and Microelectronics
Molecular Life Sciences
Management of Technology
Materials Science and Engineering
Neuroscience
Photonics
Physics
Robotics, Control and Intelligent Systems

<https://www.epfl.ch>

<https://phd.epfl.ch/programs>

Photons for Engineering and Manufacturing (PEM)

Structural and mechanical properties of metals and alloys

In-situ synchrotron X-ray and neutron diffraction

Electron microscope characterization

Computational simulation methods

Commercial alloys: Mg alloy, Red gold, Ti alloy, Al alloys,
nanocrystalline Ni, NiTi shape memory alloy

Additive manufacturing: Ti-6Al-4V, bronze



<https://www.psi.ch/pem/photons-for-engineering-and-manufacturing>

Structural and mechanical properties of metals and alloys

In-situ X-ray and neutron diffraction

Proposal writing
Sample design
Manufacturing sample
Surface preparation
Pre tests before beam time
Day / night shifts during beam time

Electron microscope characterization

Surface polishing
Operating microscope
TEM lamellar preparation

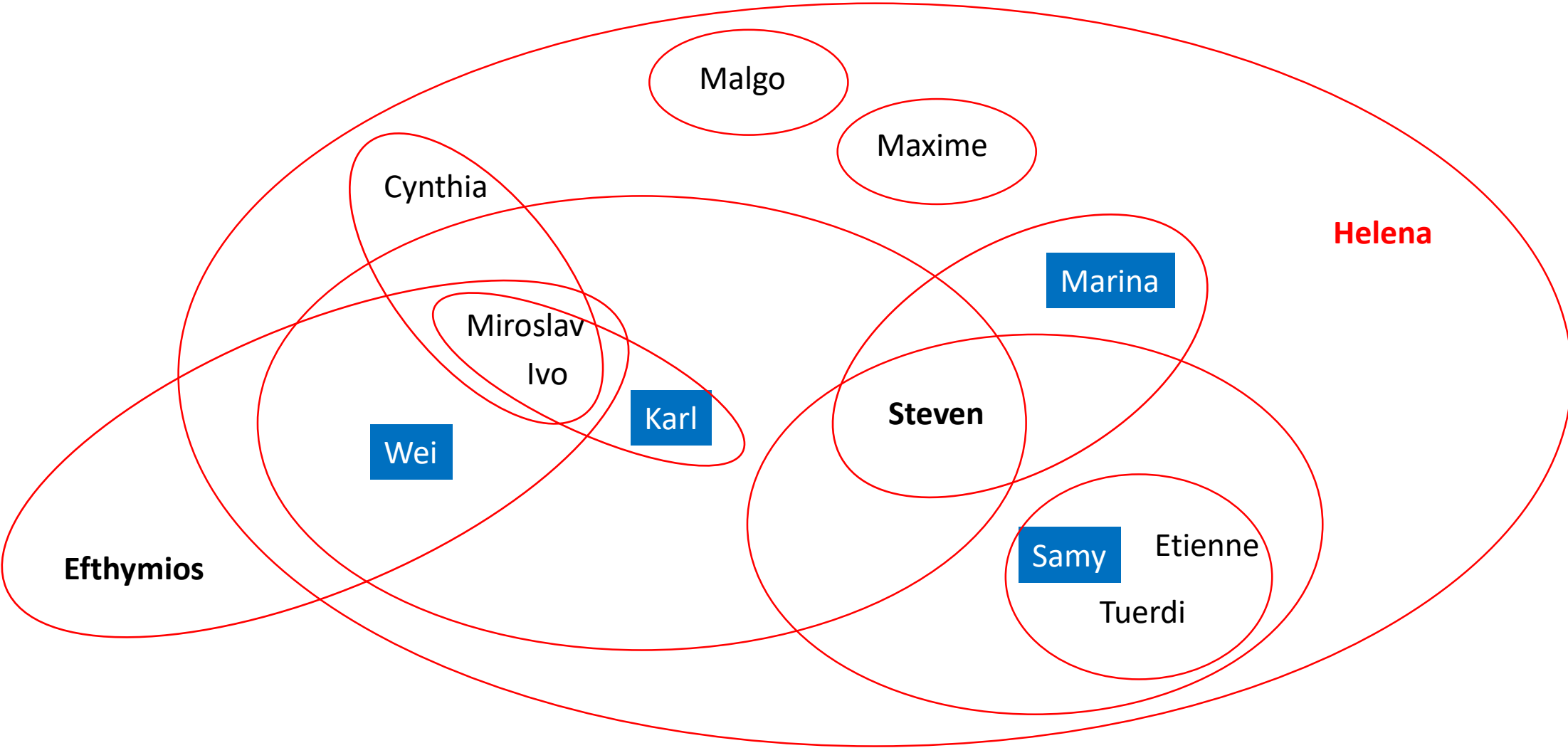
Data analysis

Peak fitting routine
Fit2D
Fullprof suite
MATLAB
OriginLab
ImageJ
ABAQUS finite element simulation
OIM for EBSD
JEM for TEM

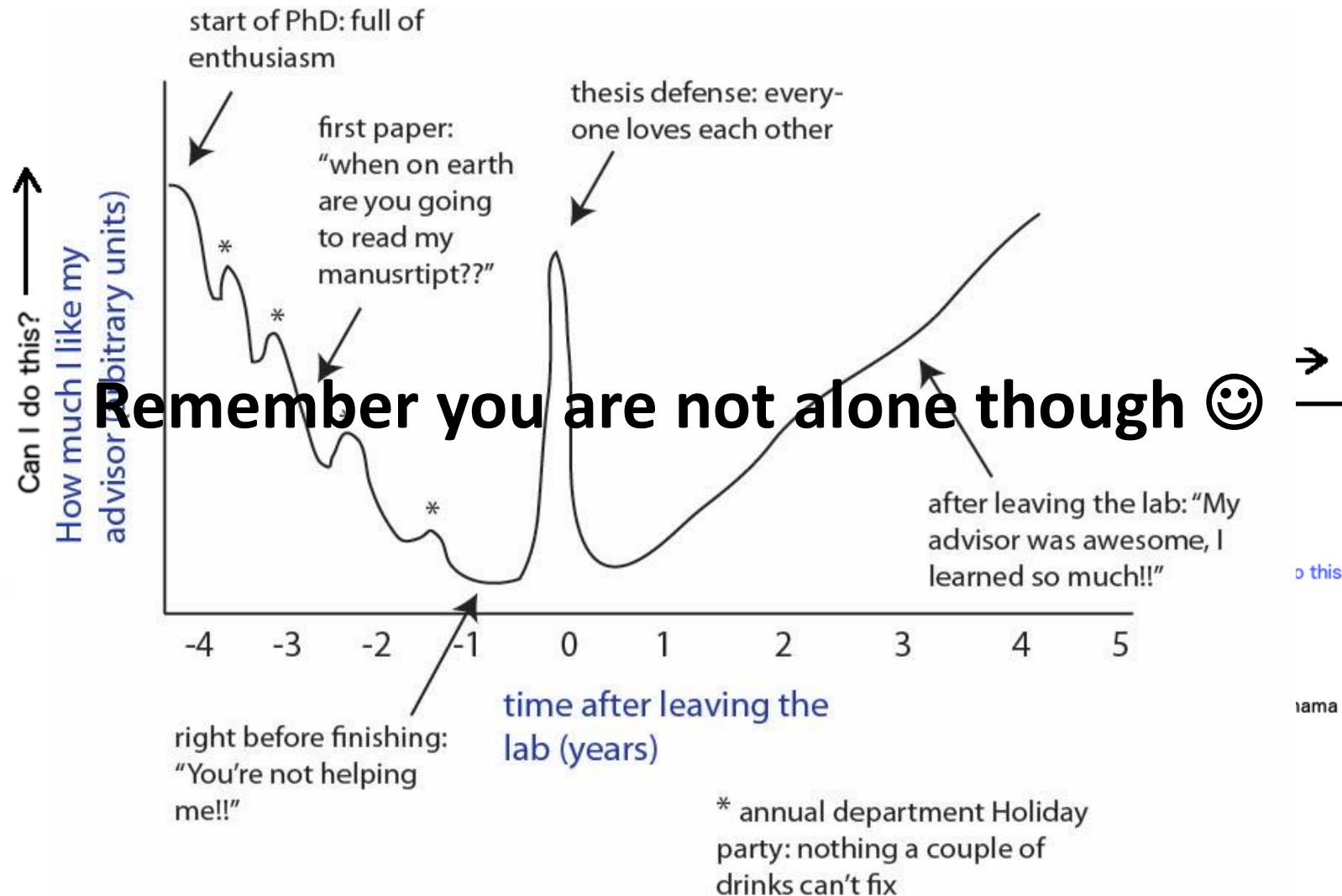
Reporting

Publication in journals
Conferences
School report (PhD student)

Team work

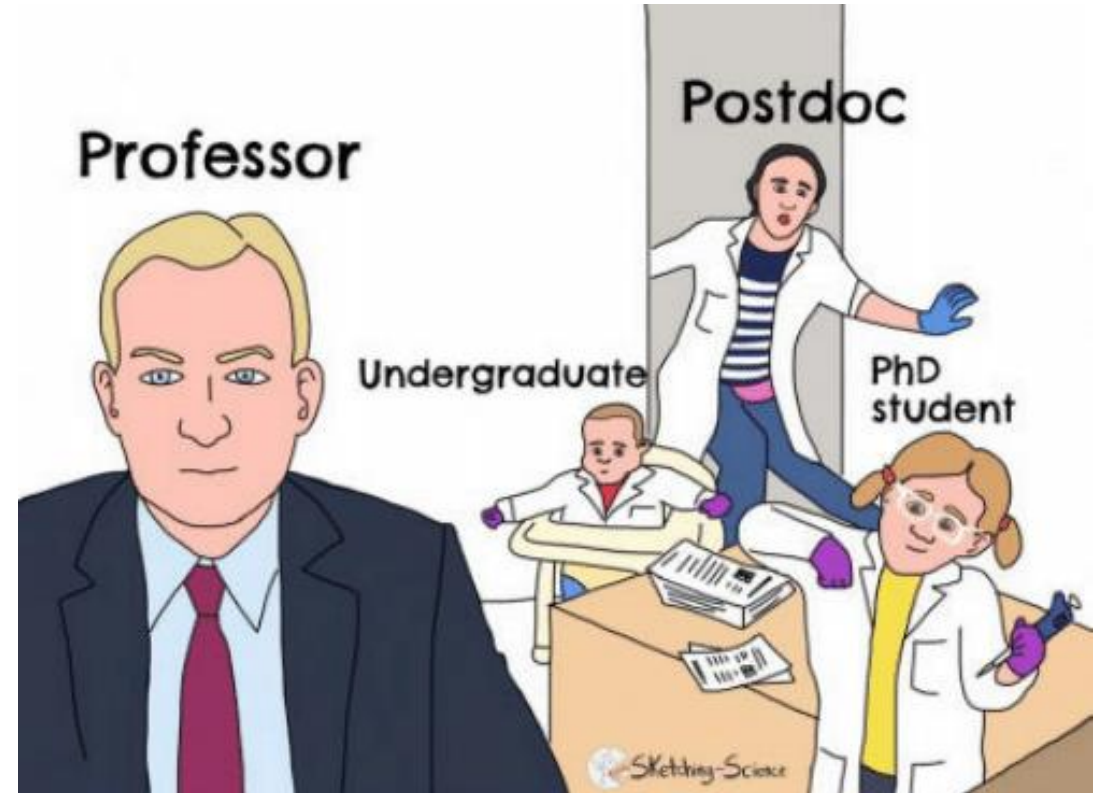


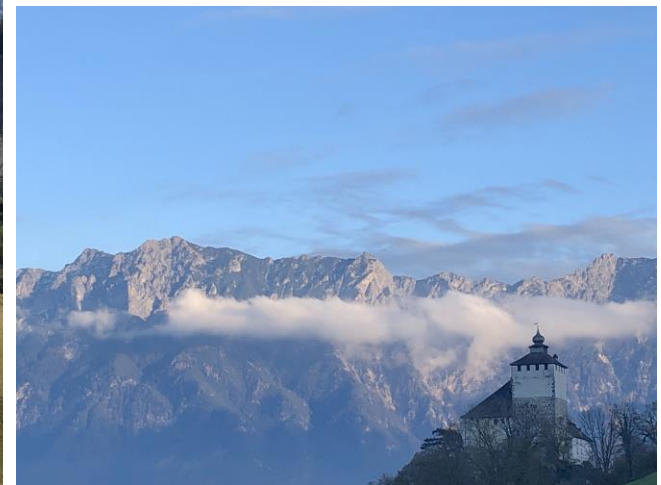
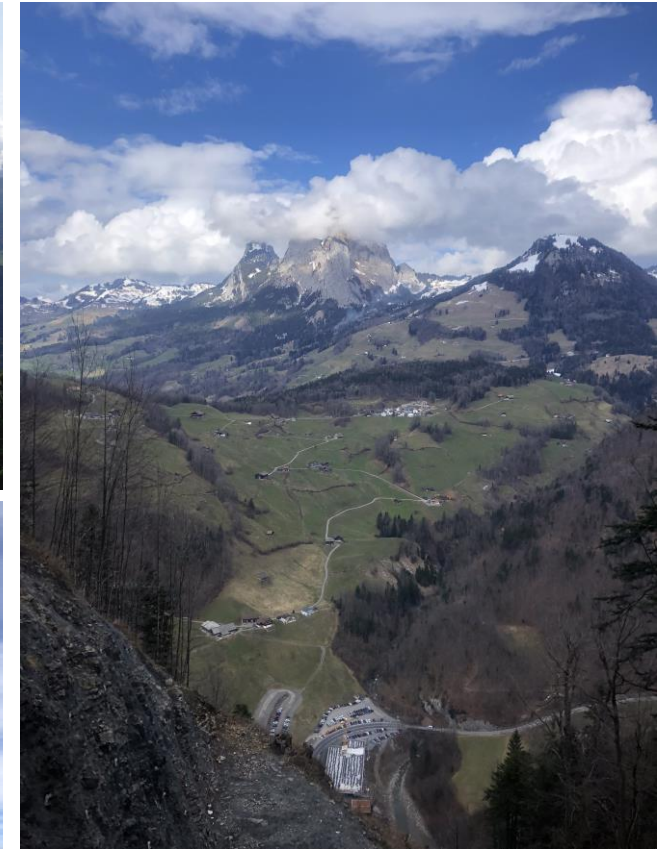
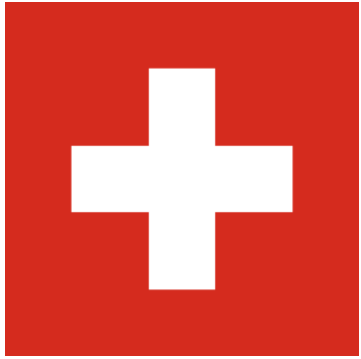
Let's be honest: PhD is **NOT** so fun



Survival guide

- Ask questions
- Initiate discussion / initiate meeting
- Dare to ask for help
- Prioritize your tasks
- **Work / life balance**





- steven79812@gmail.com