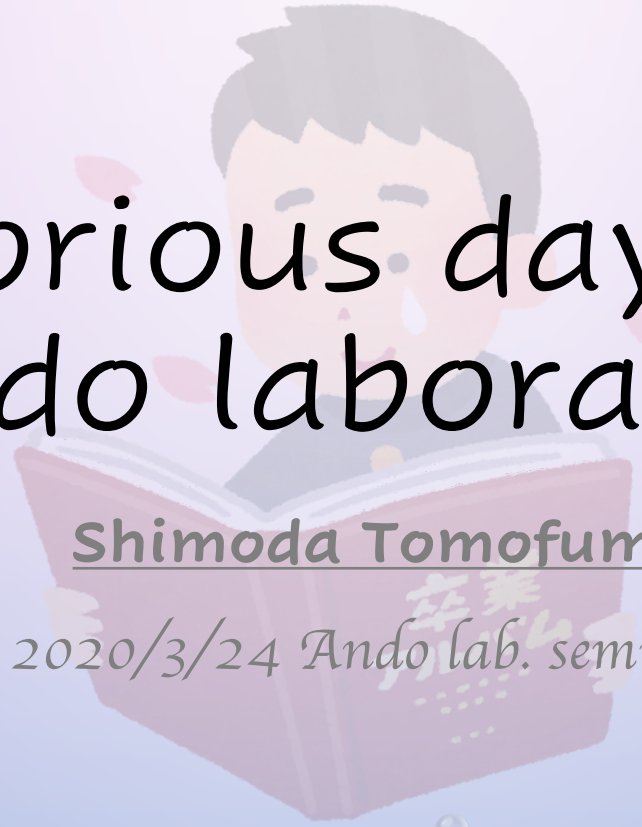
Glorious days in Ando laboratory

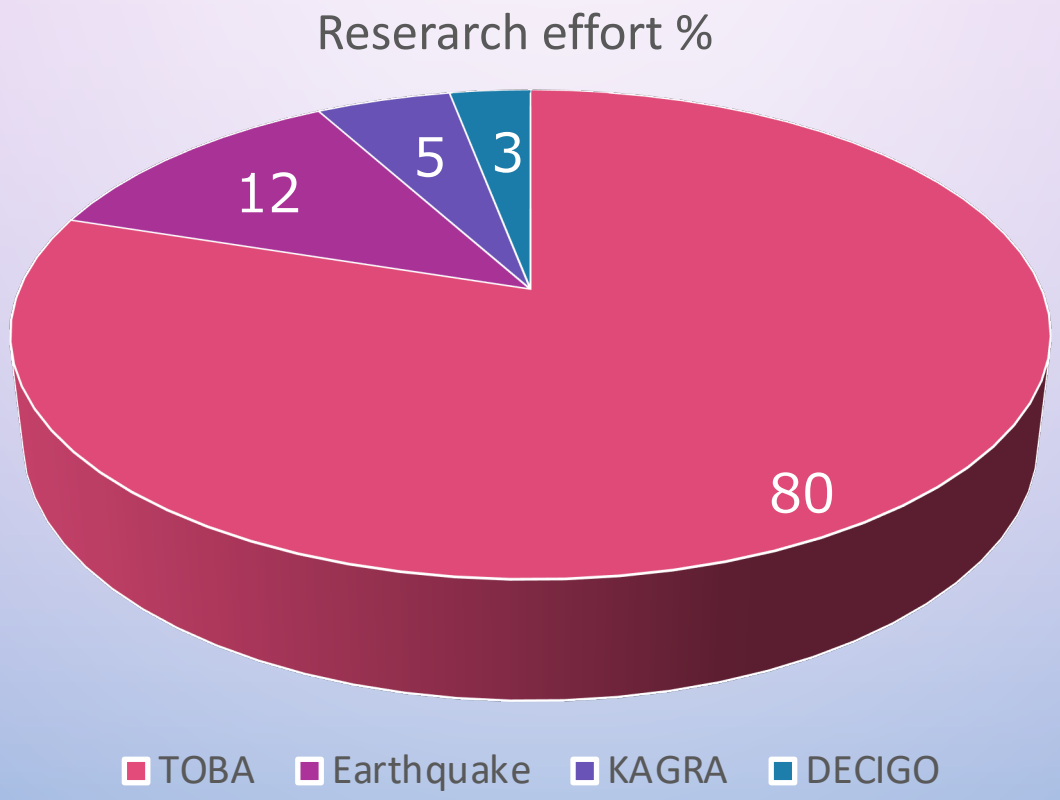
Shimoda Tomofumi

2020/3/24 Ando lab. seminar

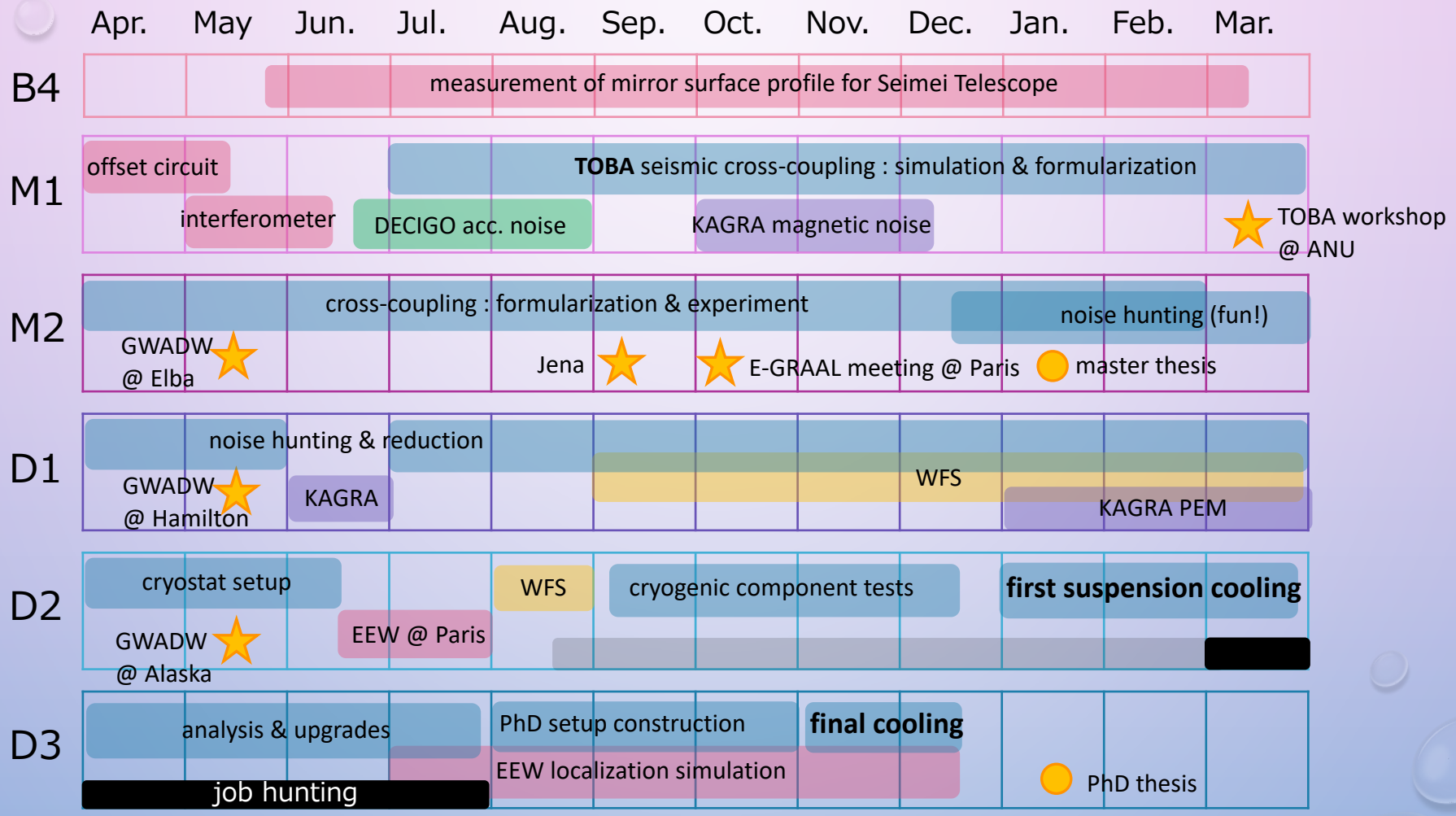


No TOBA, No Life

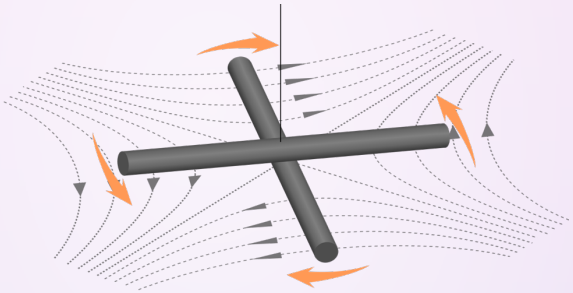
- Most of my time & energy were dedicated to TOBA



Summary of my 5-year history



Topics



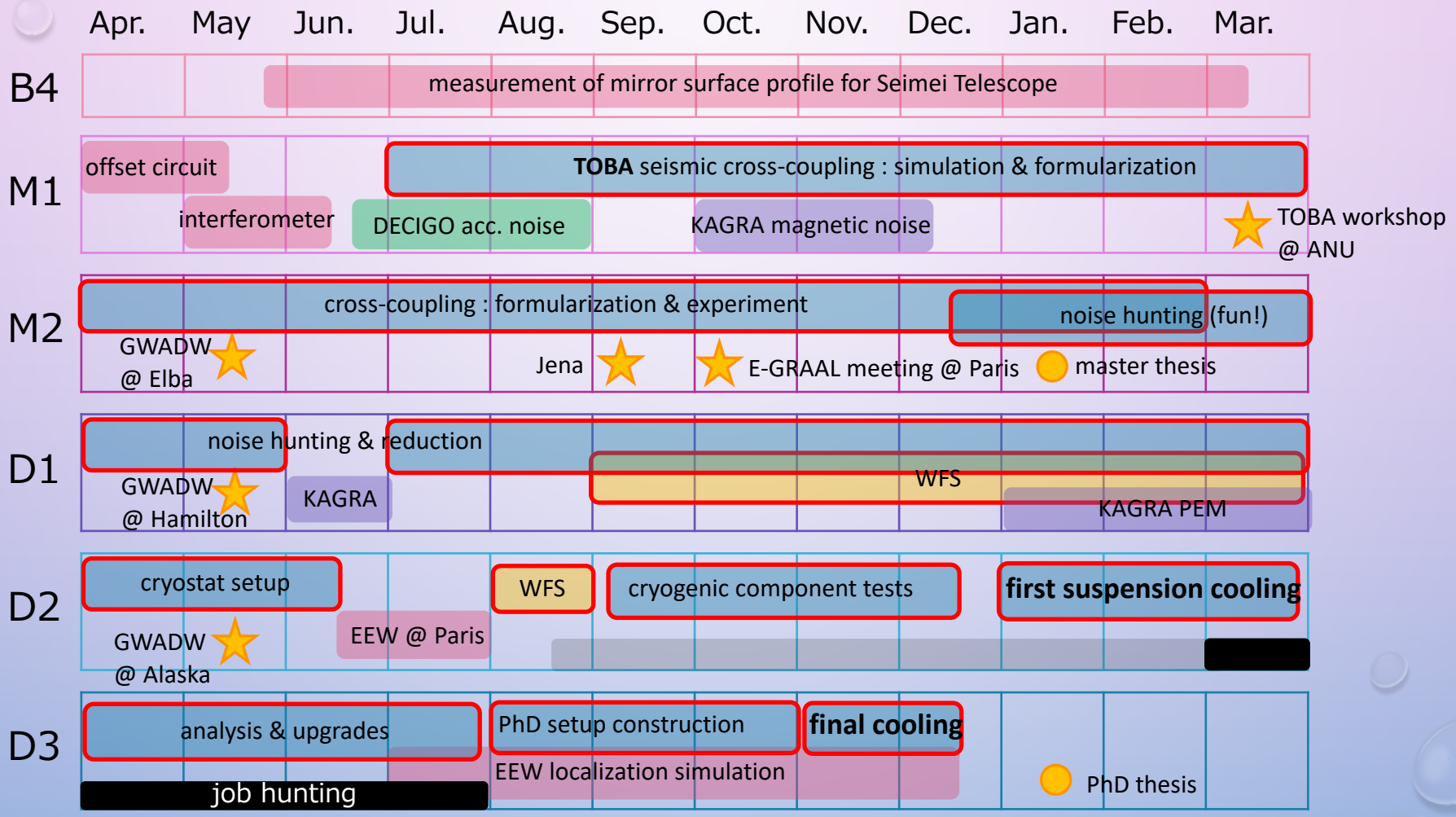
- Development of TOBA

- Visit to France (D2)

- Job hunting 2019 (D2-D3)

- PhD thesis (D3)

TOBA


Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
B4
measurement of mirror surface profile for Seimei Telescope
M1
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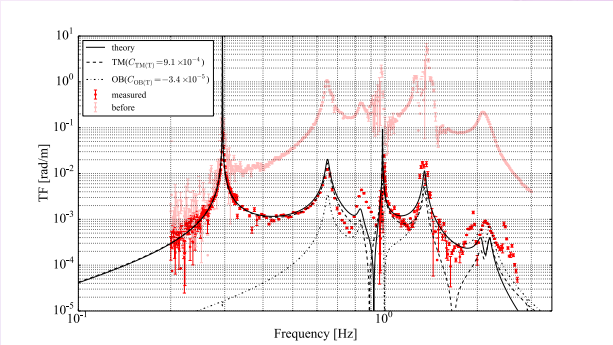
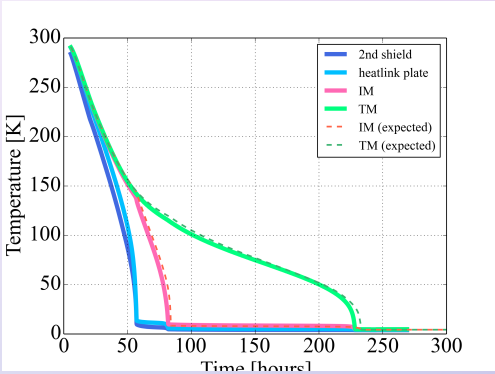
Development of TOBA

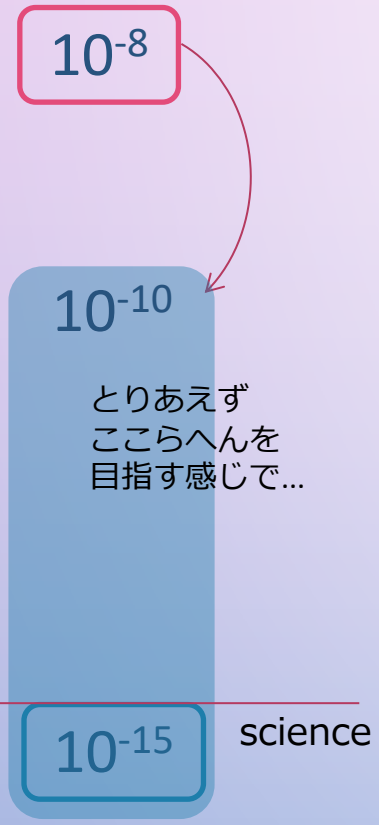


- **Seismic cross-coupling noise** (M1-M2)
- Noise hunting of small prototype (M2-D1)
- Highly sensitive WFS (D1-D2)
- **Cryogenic system** (D2-D3)
- **Theoretical works on EEW** (D2-D3)



- I was involved in <u>many topics of GW detector</u>
  - sensitivity design, vibration isolation, optics, cryogenics, ...
  - this is a merit of TOBA

Long way to science



- I have been mainly focused on component researches
  - insufficient effort for commissioning
- consequently, the target sensitivity was always ambiguous
  - though the “goal” was 10^{-15}

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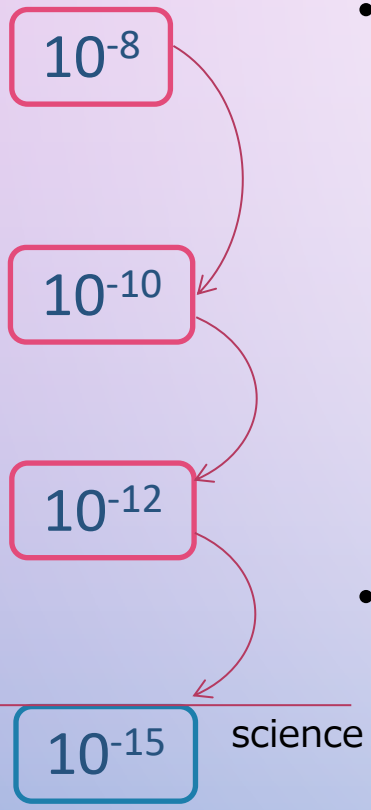
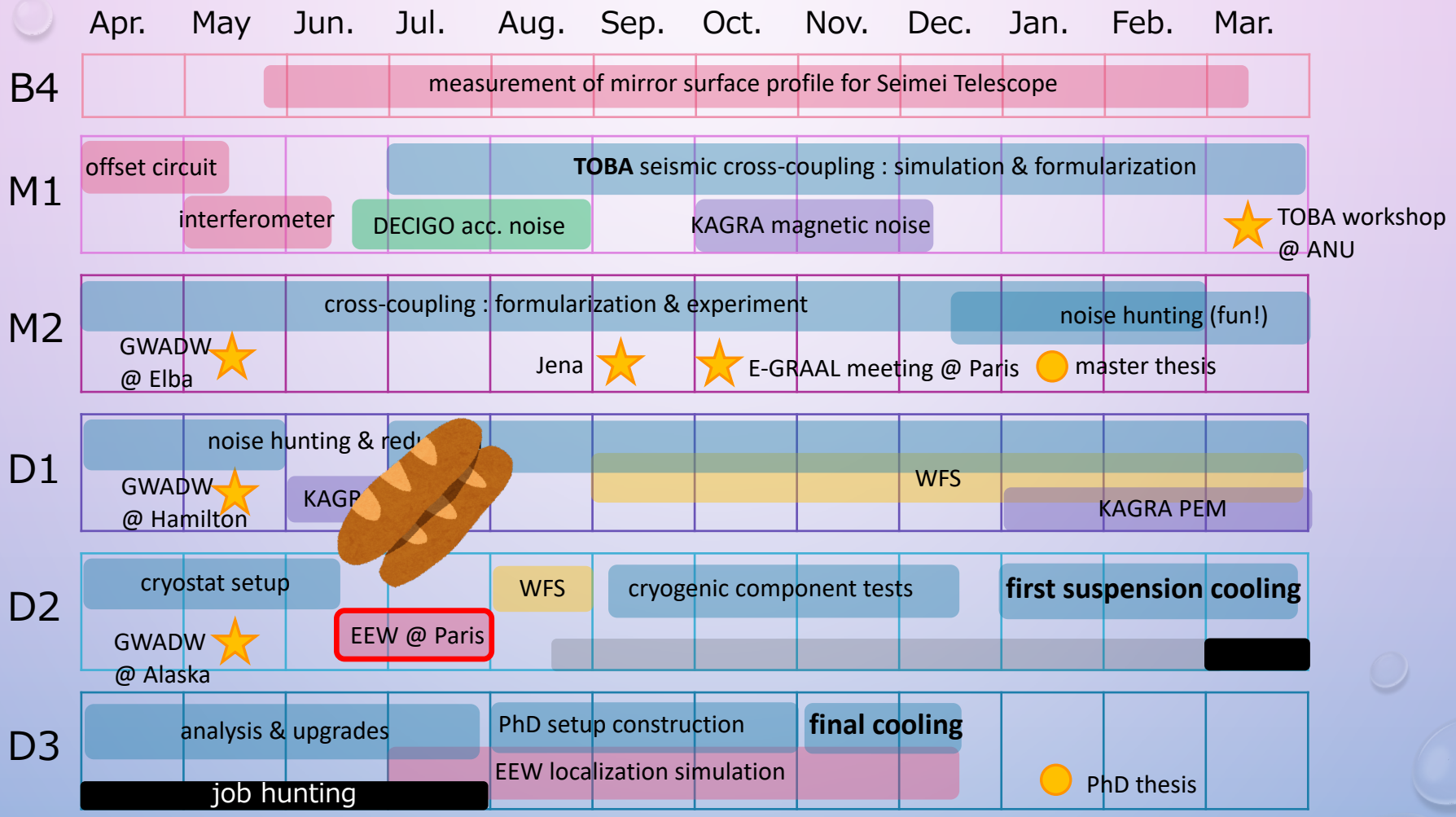
- frequent **commissioning** is essential for steadily sensitivity improvement

Long way to science



- Problem : such a step-by-step development is disturbed by the thesis schedule
  - the prototype setups have been replaced for every theses (Ishidoshiro, Okada, Shoda, Shimoda...)
  - because only a “commissioning” is insufficient for thesis
- PhD student is not a good choice as a manager of the long-term project ?

France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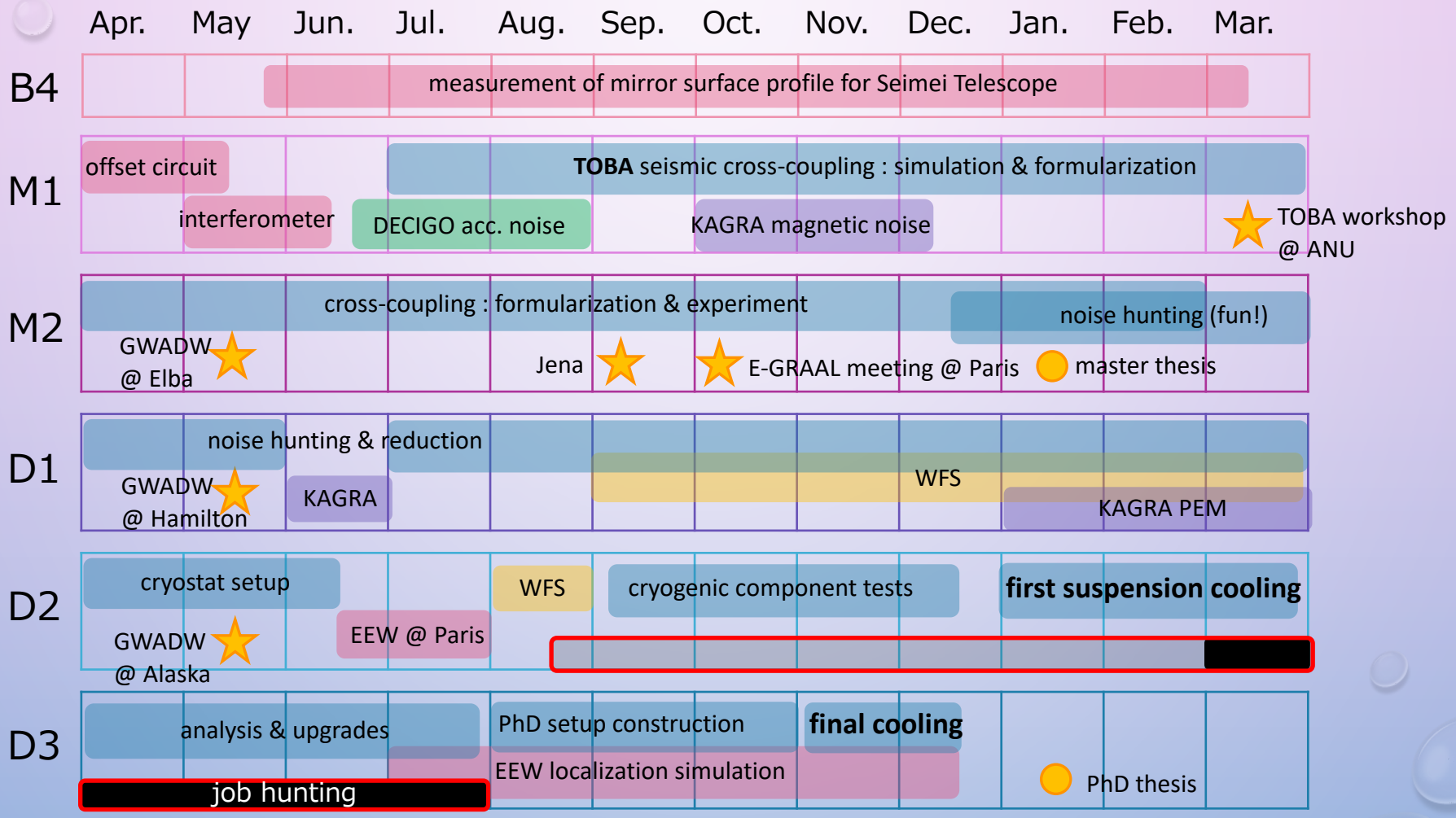
Visit to France (D2, summer)

This was my first long-term stay in abroad

- I wanted to do science

- During the stay, I was working on the computational study about EEW (programming) with Kevin Juhel.
- studying with a group in other field (geophysics) was a good experience for me
  - I should have visited to abroad earlier
- There are many places for sightseeing in France

Job hunting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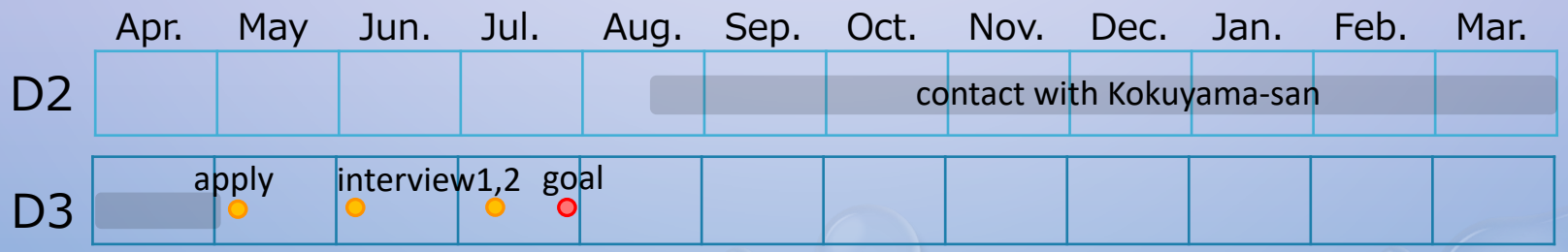
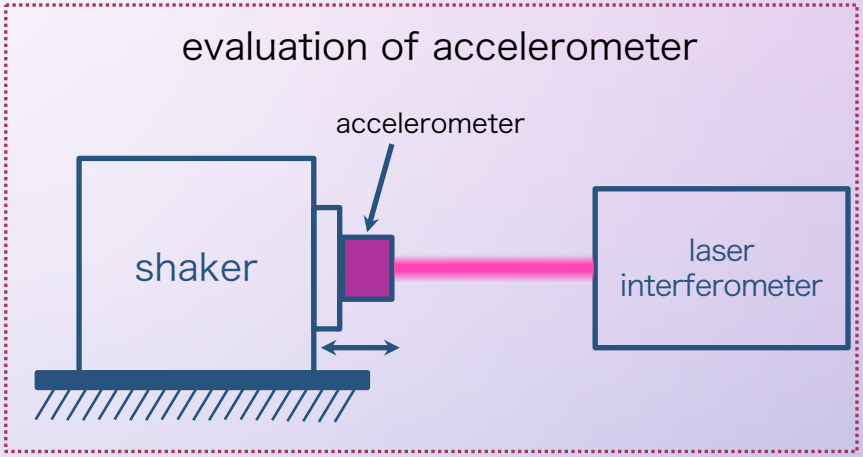
Job hunting 2019 (D2 summer ~ D3 summer)

- academic? company?
  - I wanted to do research or engineering in a stable position
- I applied to a tenure track position in AIST(産総研)
- I also applied to other campanies
  - there are many company's research institutes
  - activities in Ando lab. (optics, programming, CAD, ...) can be advantages a little



What I will do from next April

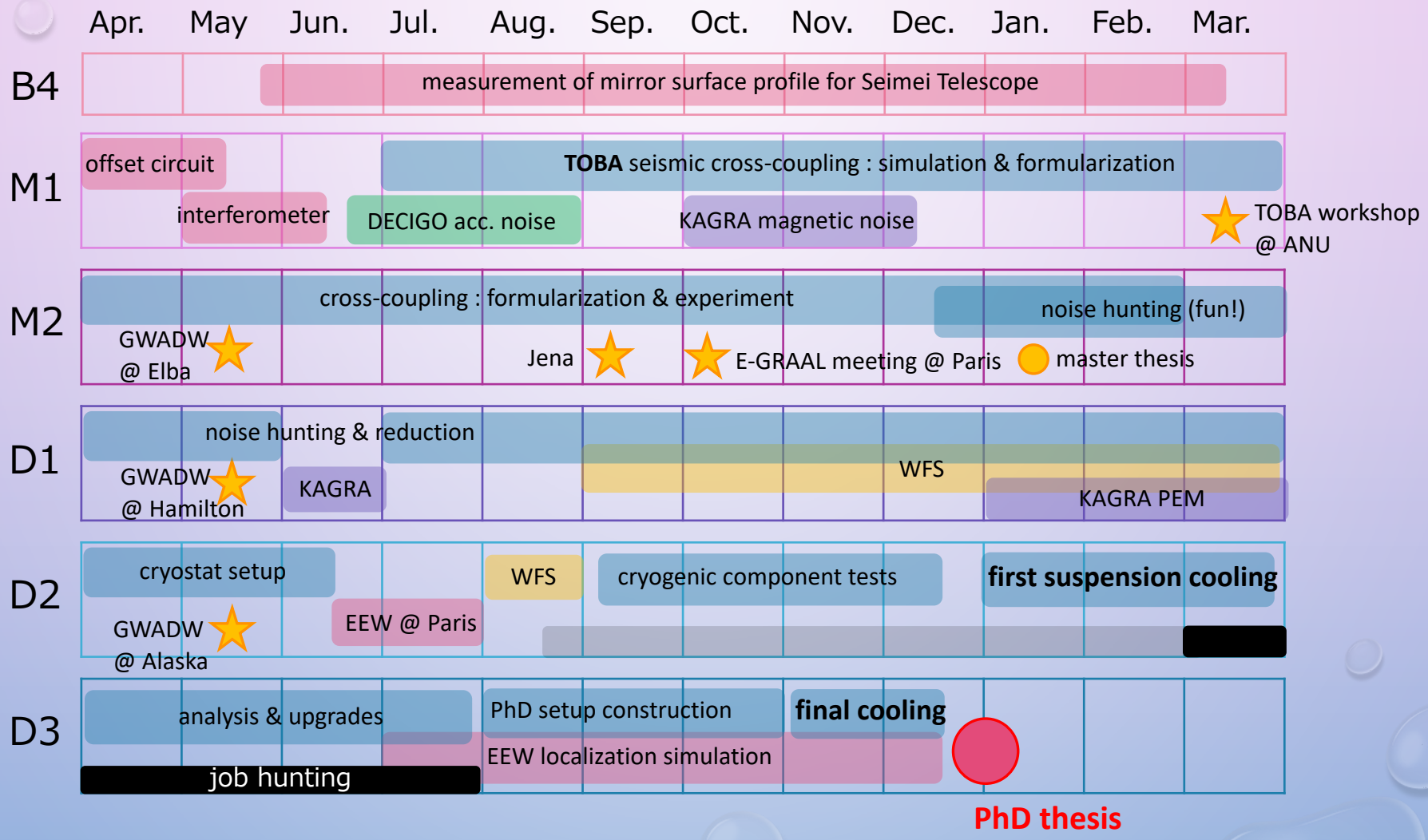
- Accurate evaluation of accelerometer
  - acceleration standard in Japan



- topic : improvement of the evaluation accuracy & precision
  - reducing the interferometer noise
  - vibration isolation
  - etc

I hope I have chance to collaborate with you !

PhD thesis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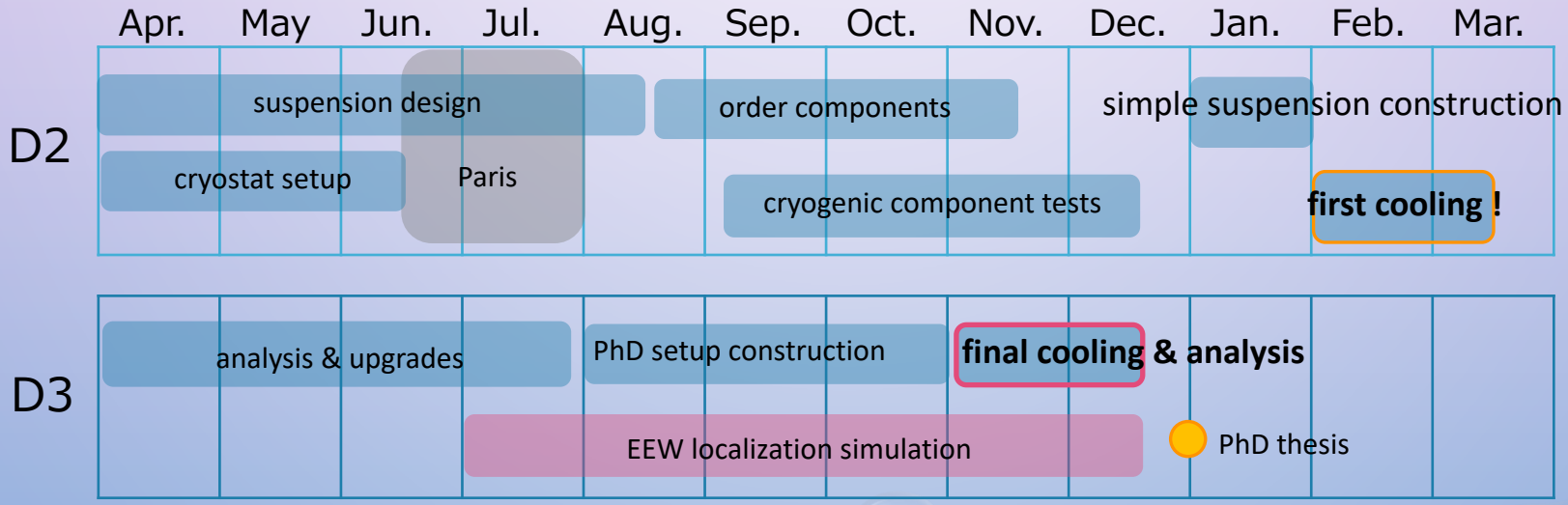
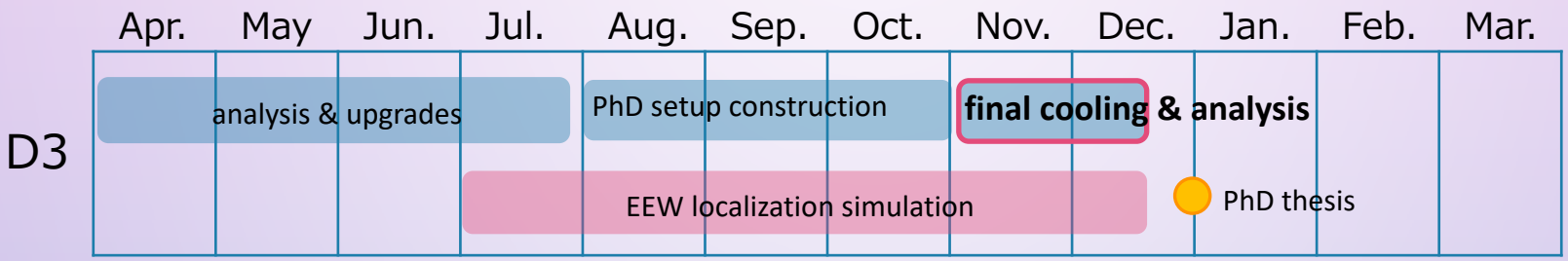
PhD thesis schedule

- I decided to work on cryogenic TOBA around the end of D1 year
  - it was a conservative choice to get PhD
  - I was also interested in noise hunting and sensitivity improvement of the prototype, but it was not worth getting PhD



troubles

- Note that troubles will definitely happen

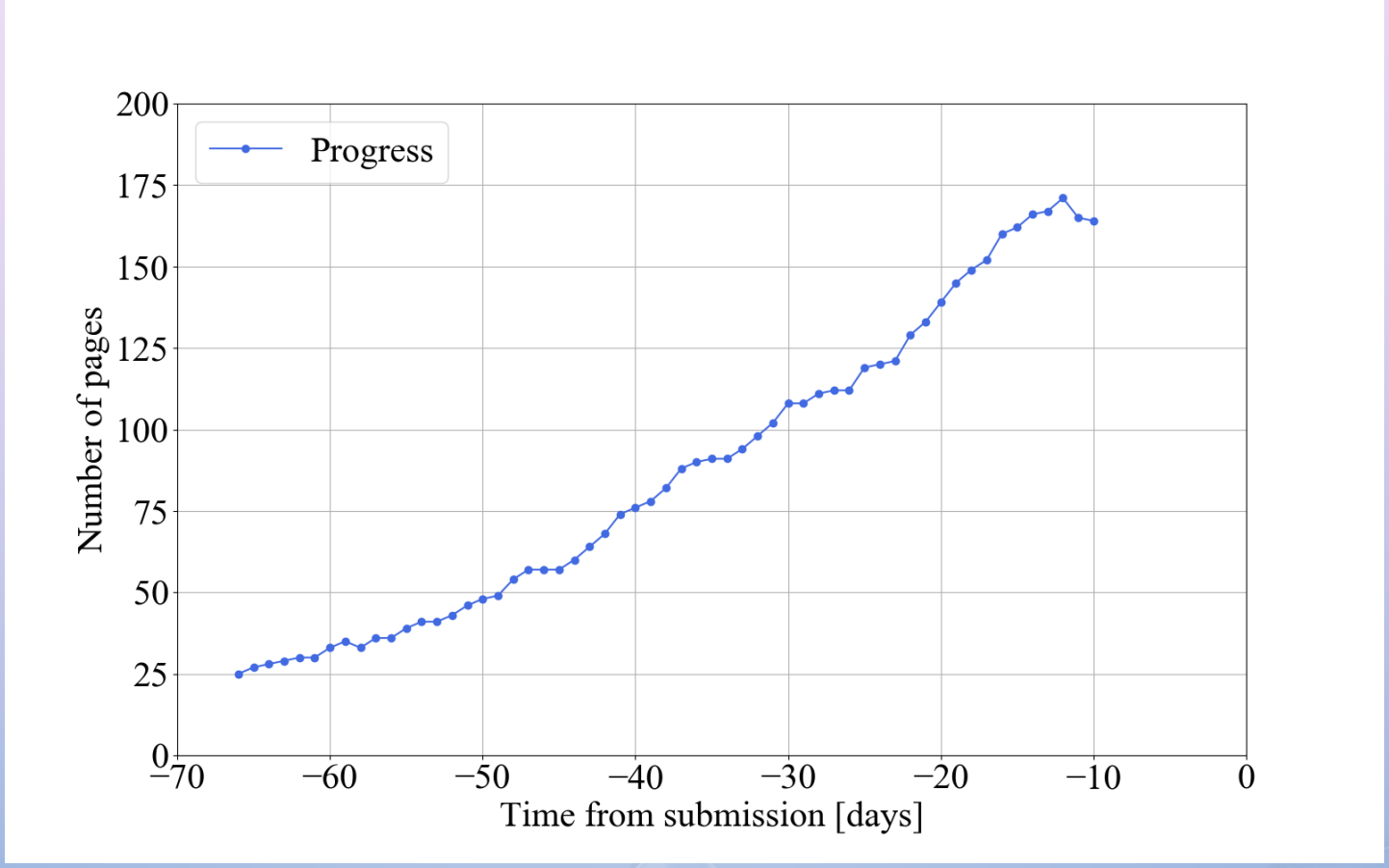


- seismic vibration suddenly increased just after starting the final experiment -> suspension lock got unstable
- power shortage in 理学部1号館 -> power unit of PC died
- reverse flow from the turbo pump -> 0.1 Pa in the cryostat

everything happened around November

Page number history

- 2.5 pages/day



Summary

Thank you for everything in Ando lab.