Community Engagement: MKI
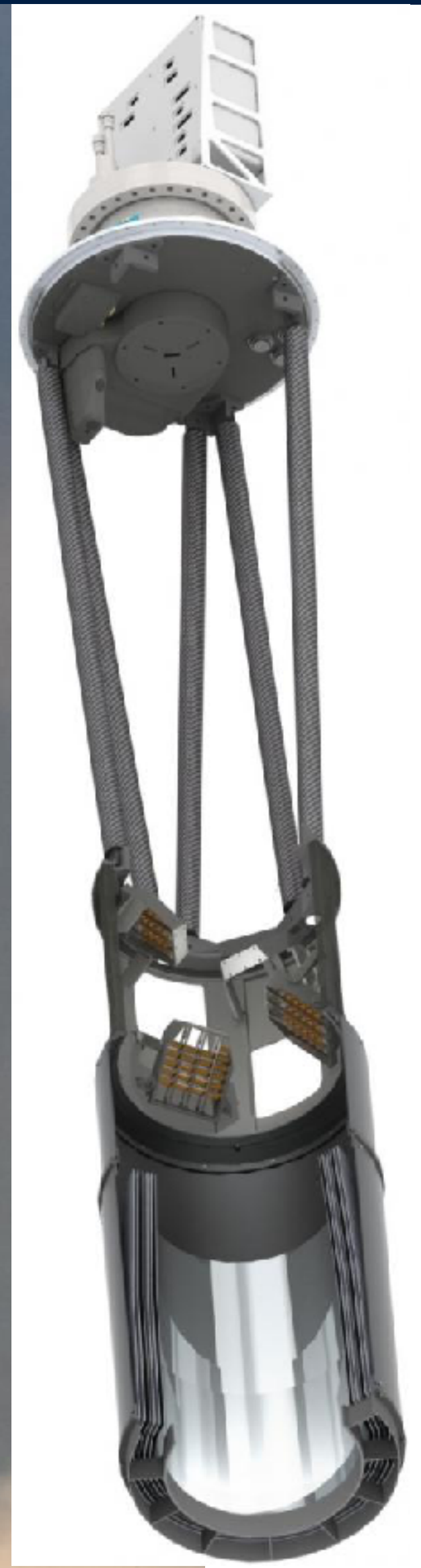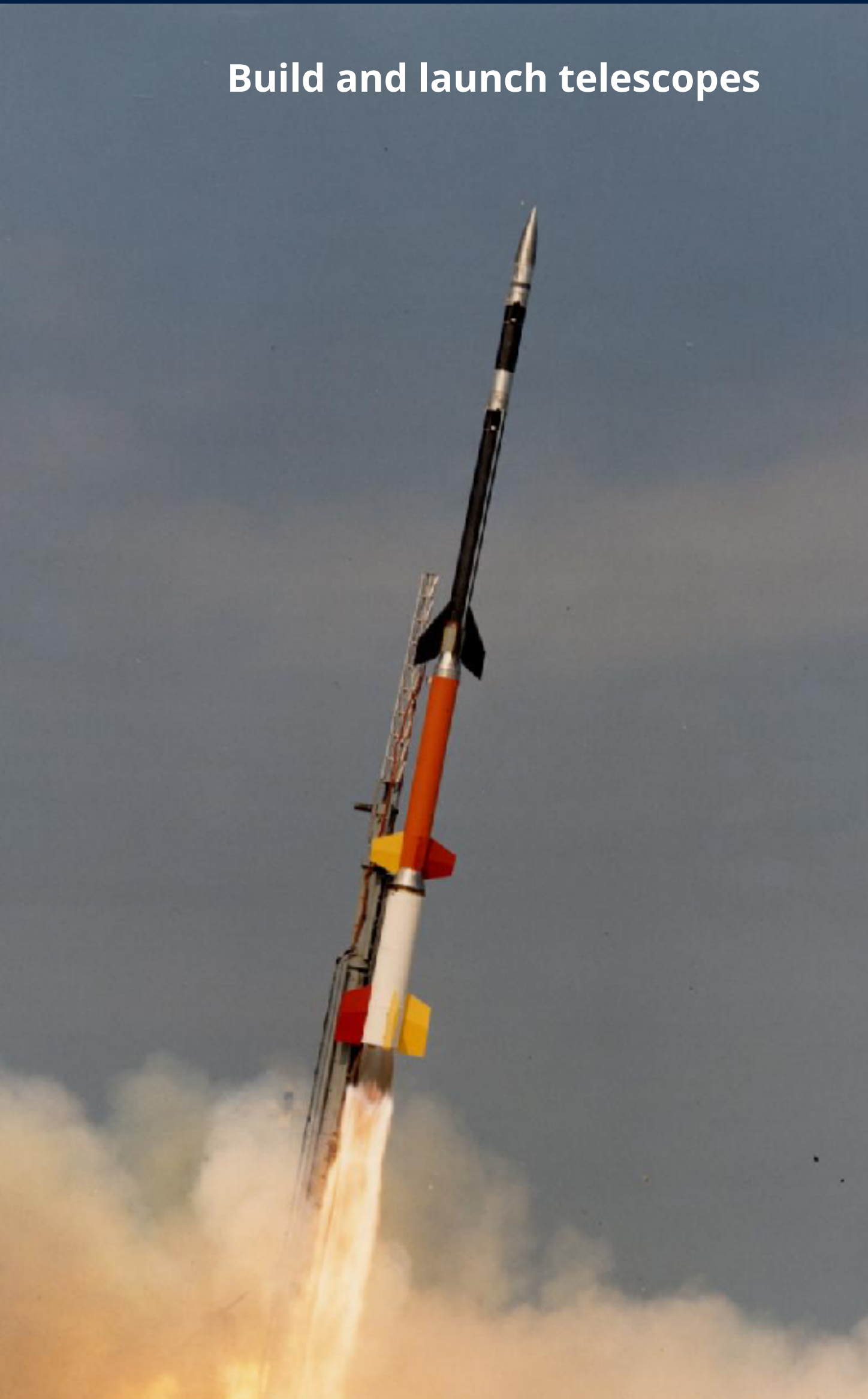
Josh Borrow (MKI)
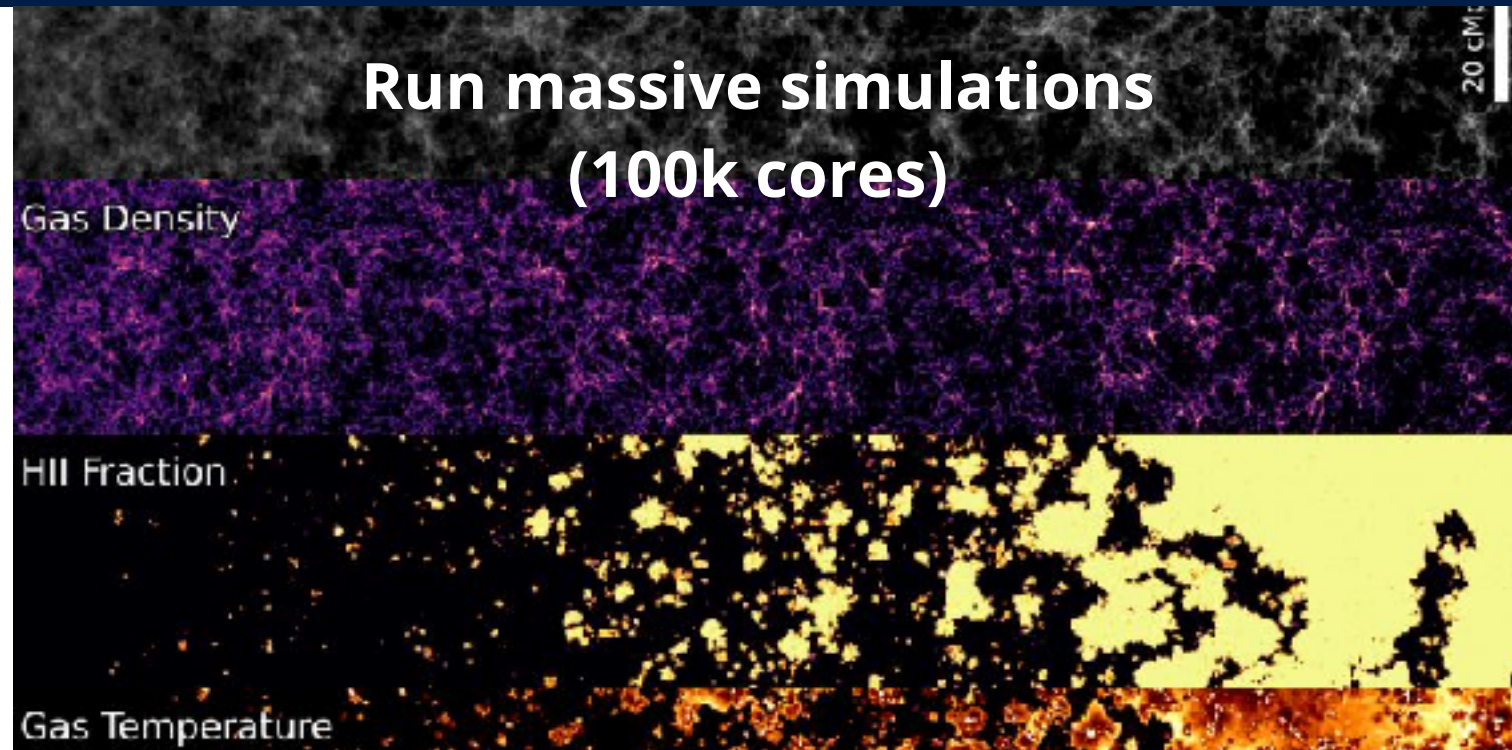
MIT KAVLI INSTITUTE

subMIT Review: 18 July 2023

About MKI

Build and launch telescopes

Run massive simulations (100k cores)

Gas Density

HII Fraction

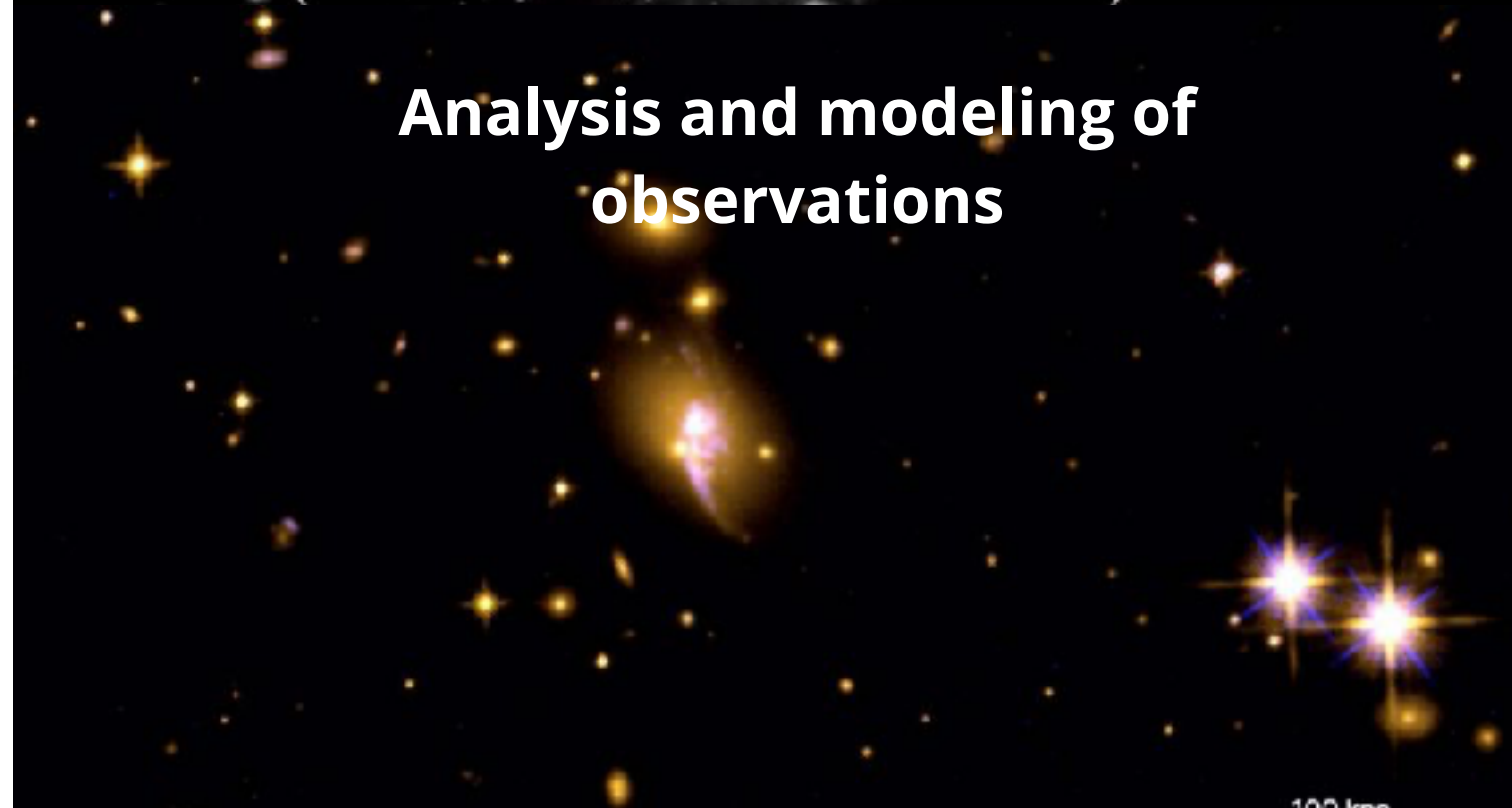Gas Temperature

Small-scale simulations
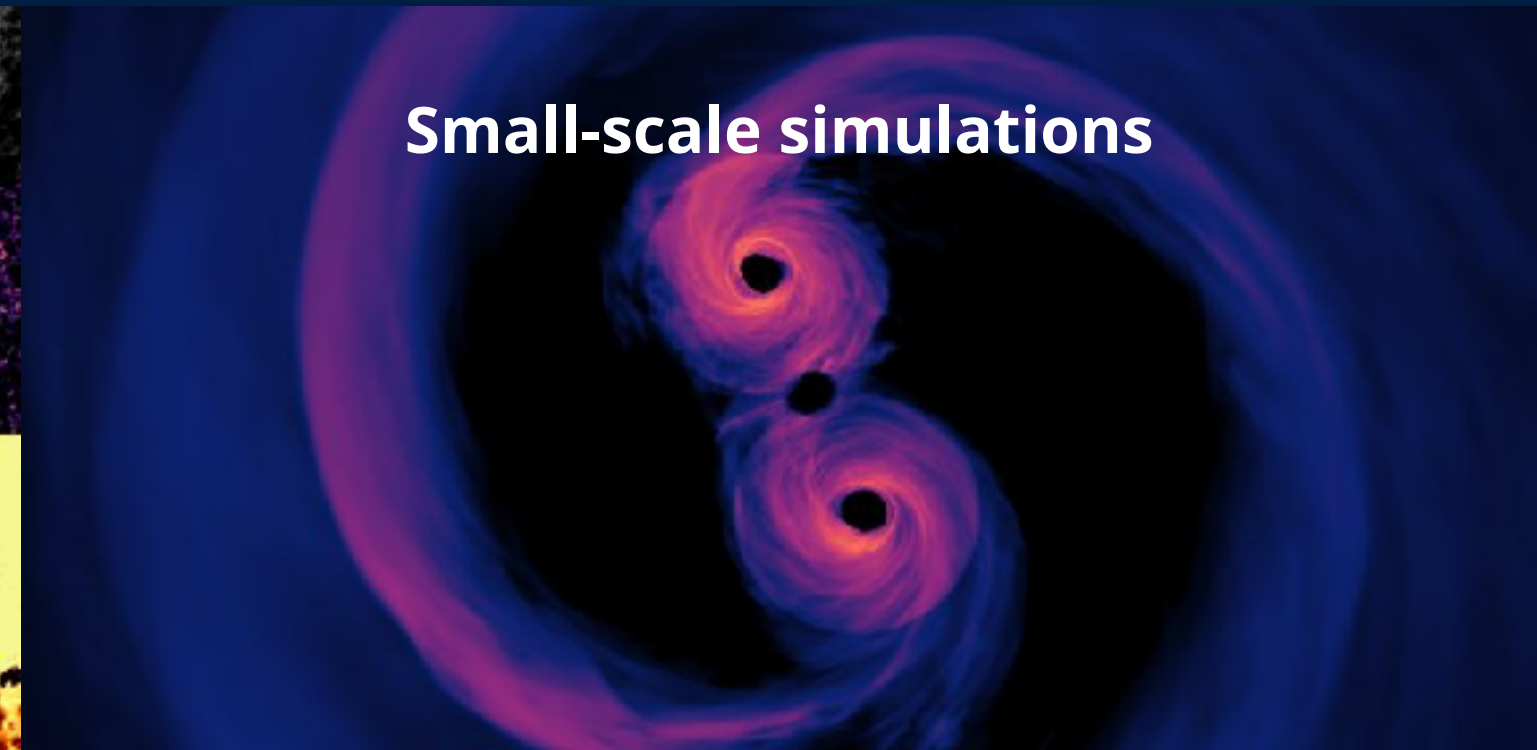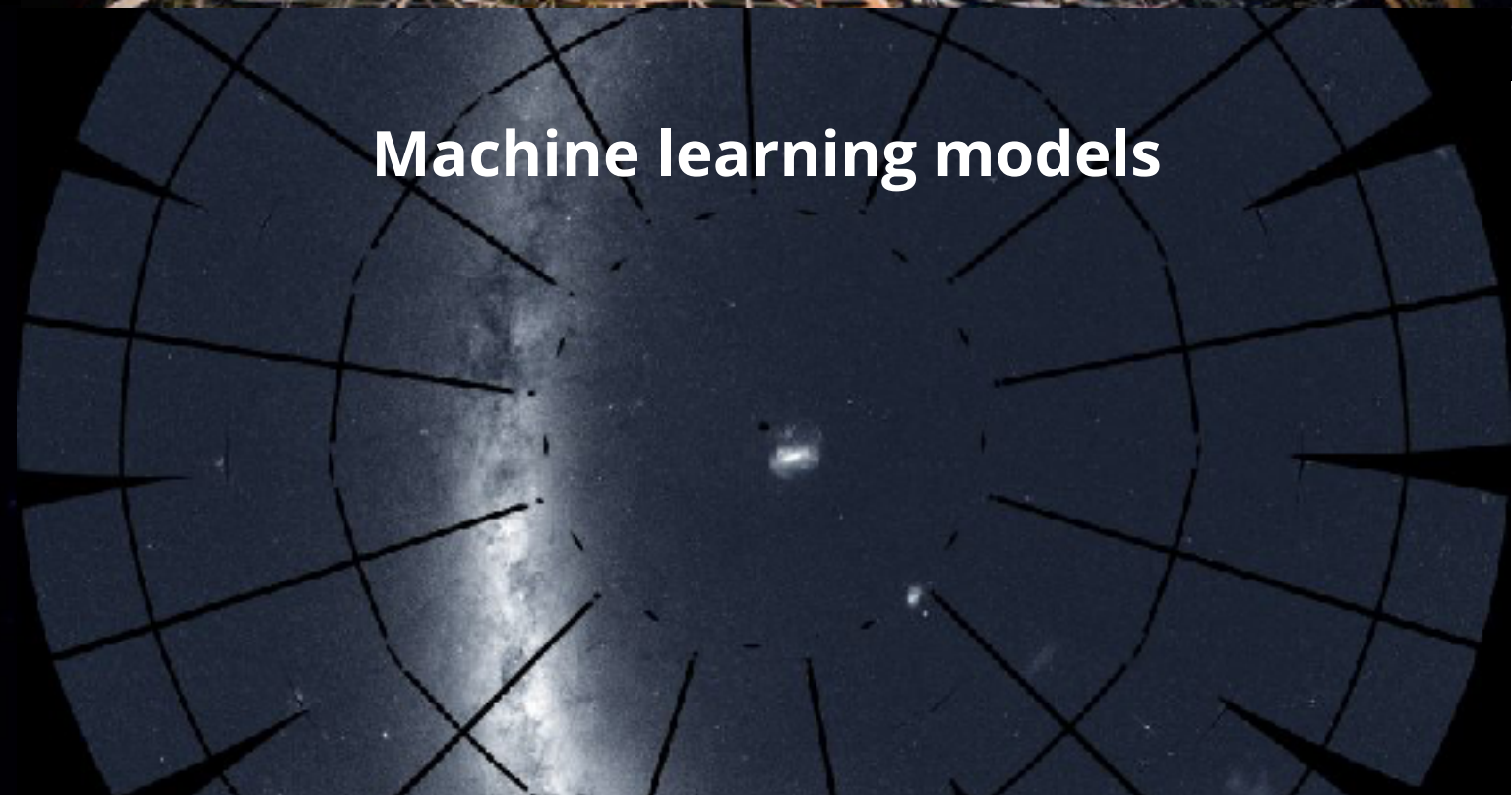
Big data analysis (Pbs; simulated)
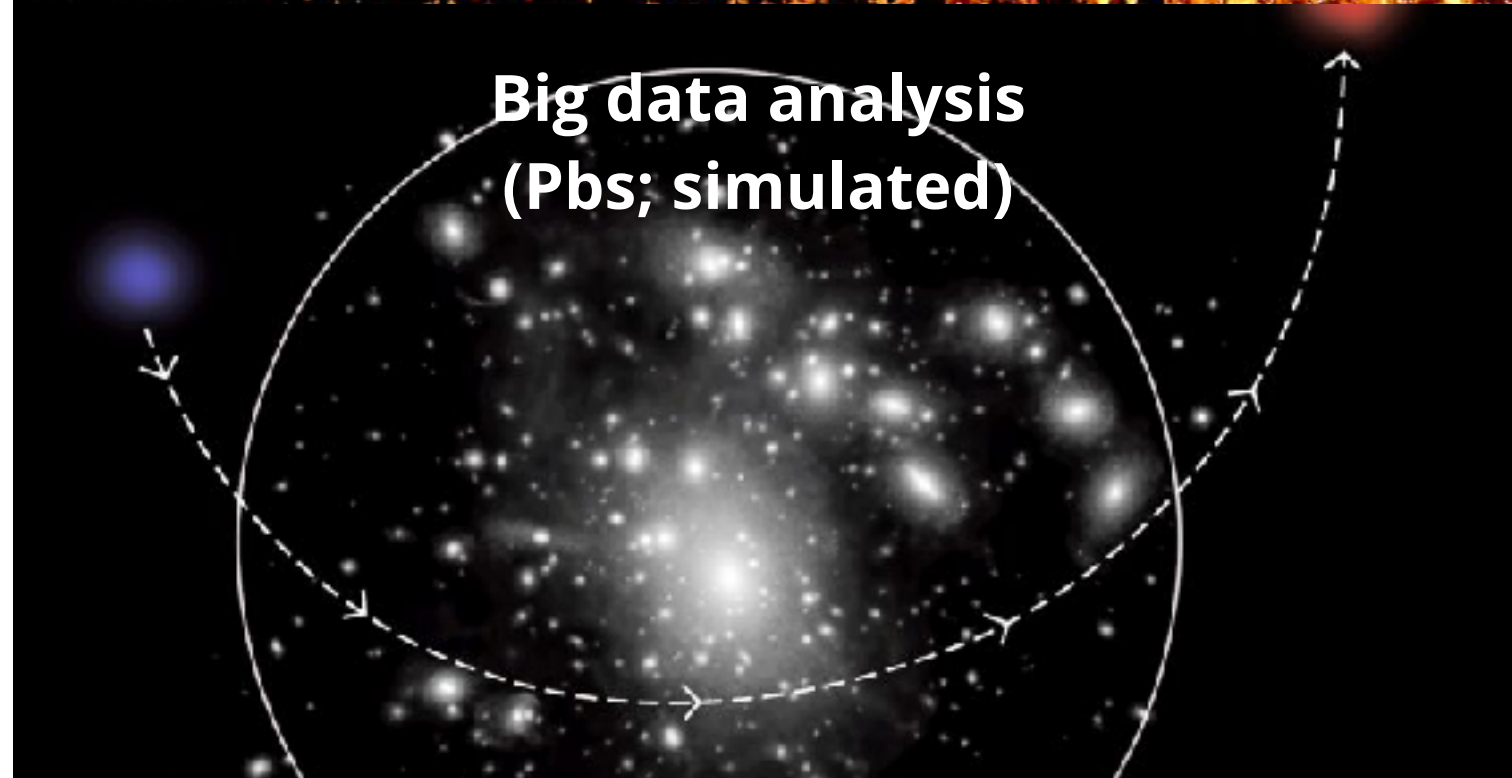
Big data analysis (Time-series)

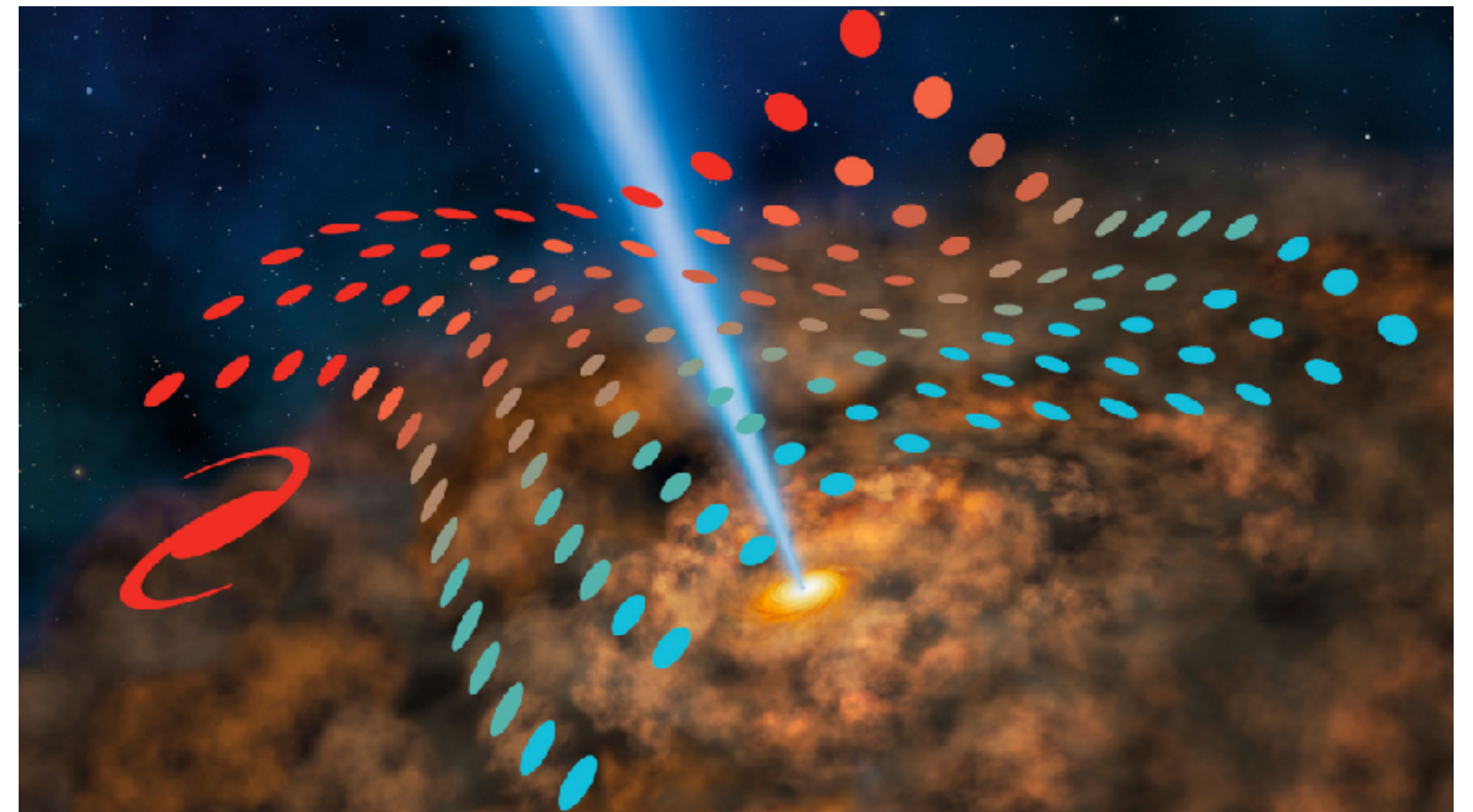**Analysis and modeling of observations**

**Machine learning models**

MKI Identified as Under-Served

- MKI was identified as being **under-served by subMIT**, with all team members being outside of the group.

- Myself and Matt were brought on to assist in **integrating the MKI community** with subMIT, and helping tailor subMIT to their workflow.

Towards a comprehensive computing service

- Previous subMIT efforts have focused on:

  - Hardware

  - User support

  - Creation of a users guide

  - A series of users group meetings
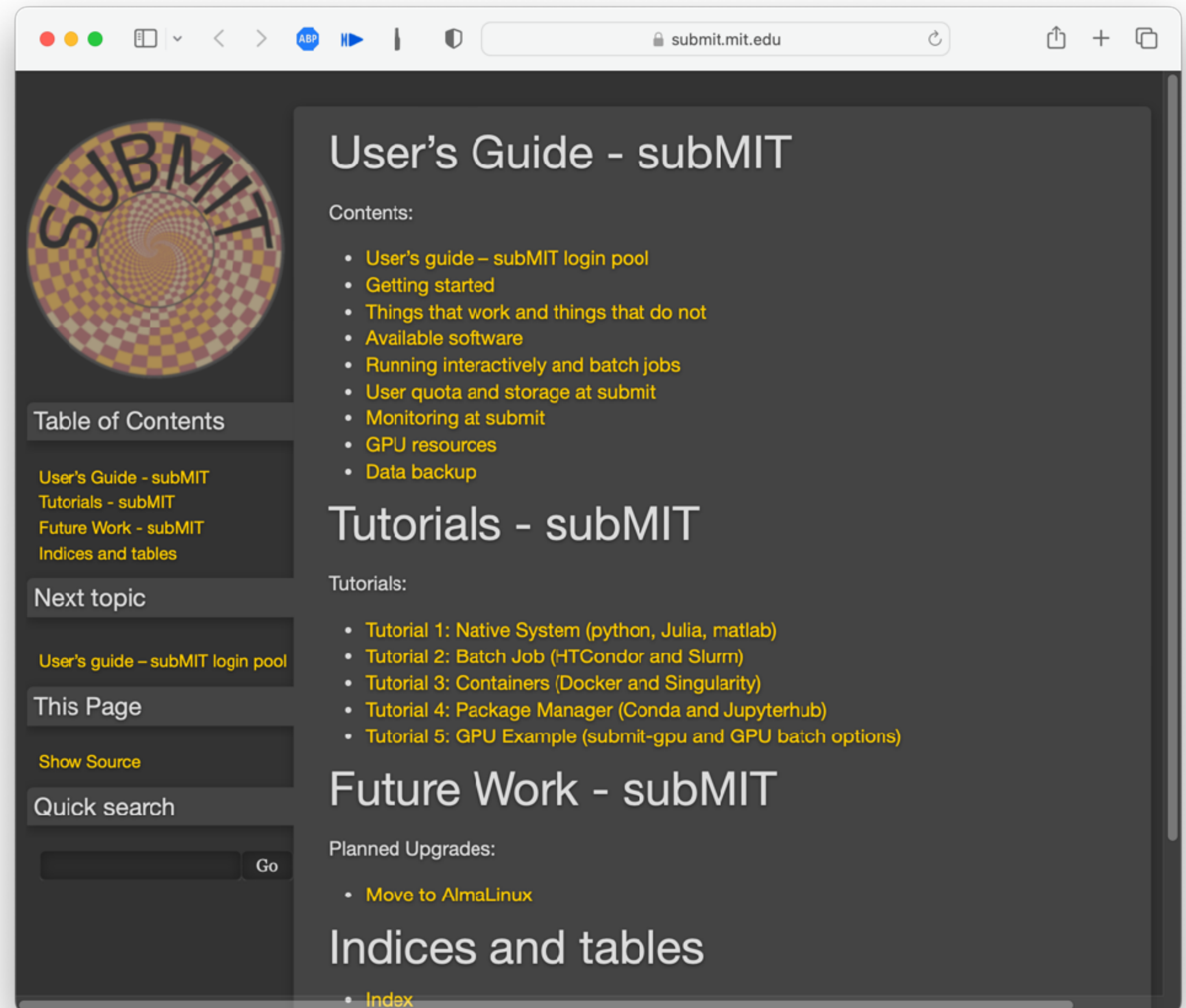
The missing pieces until now

- A few things were missing from a comprehensive computing service:

  - One to one support

  - Understanding of user-base and requirements (see Matt's talk also)

  - User onboarding

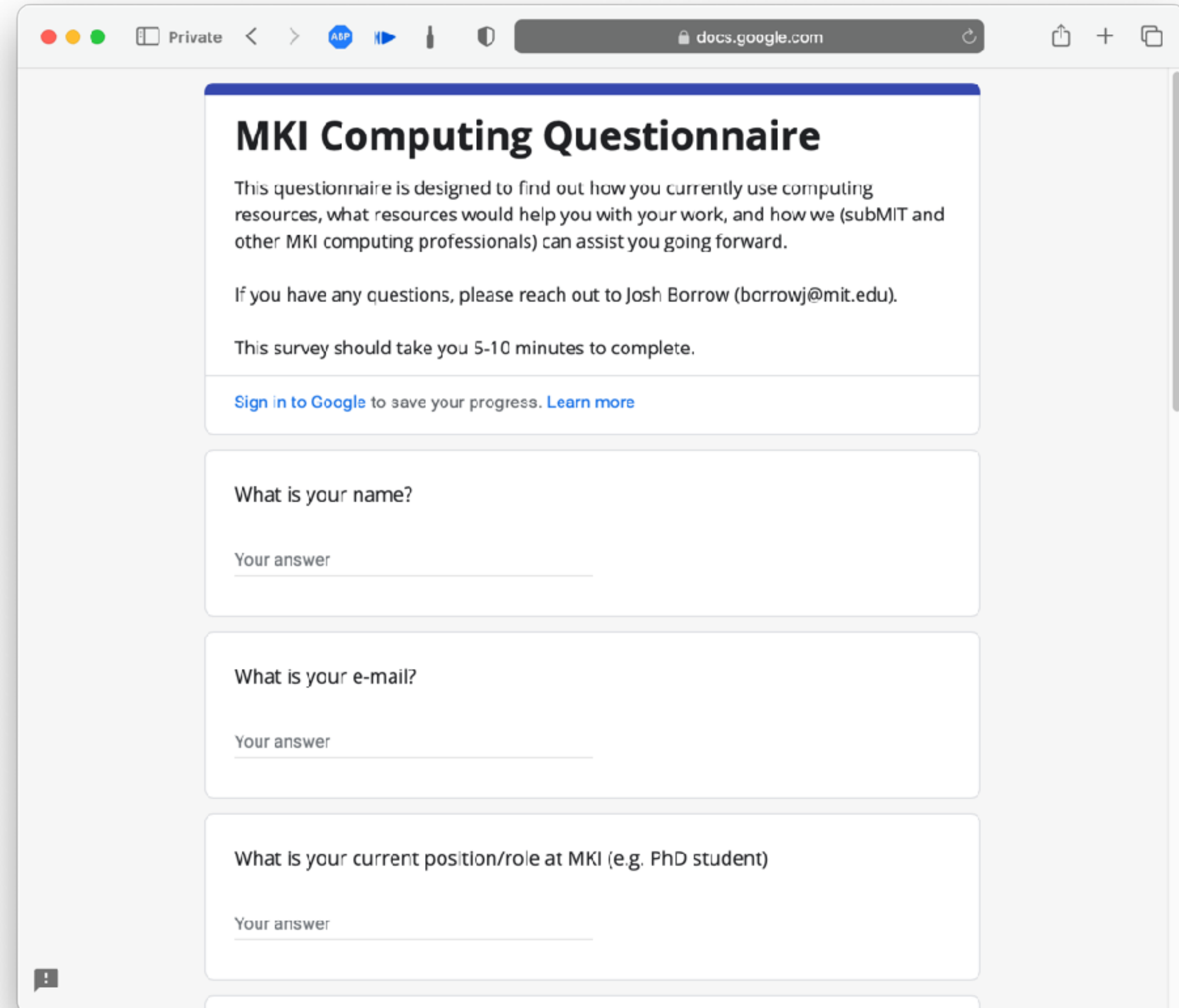 - Community building

  - User training

One-to-one user support

- Some users may need more than one-off e-mails.

- To assist with onboarding and to direct users to the most appropriate resources, within MKI I have been providing **longer-term one-to-one support for researchers**.

- Example: Javier Viana & Mariona Agusti in MKI setting up their GPU accelerated ML pipeline.
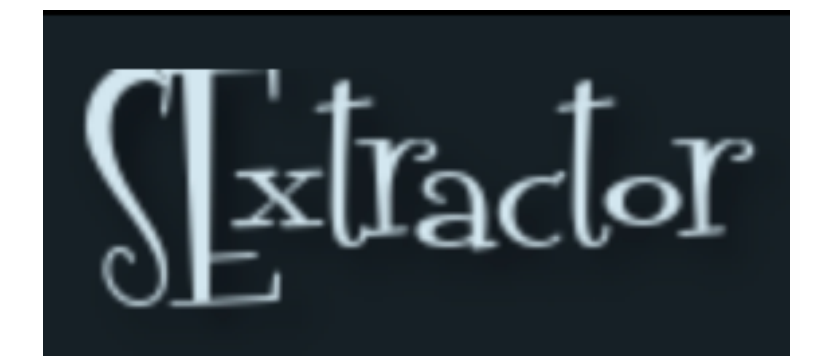
Surveying MKI

- Survey was sent out on Monday 3rd April 2023. Results were closed on the 28th April 2023. We received **22 responses**, with a **good spread throughout the hierarchy within MKI**:

  - 5 Graduate Students

  - 4 Postdocs

  - 11 Research Scientist/Other Senior Staff

  - 2 Faculty

- There was a wide range of research areas that responded, from instrumentation development to galaxy formation theory.

Key survey results

- Up to **90% of respondents work is appropriate for deployment on subMIT**. Despite this, **only 27% of respondents have actually used subMIT**.

- Users request **more training** (e.g. how to use Visual Studio Code with subMIT) and **education** on the system, and changes to the users guide.

- From an **ongoing resource acquisition standpoint**, it appears **many users are CPU and storage limited**.

What was your familiarity with subMIT before taking this survey?
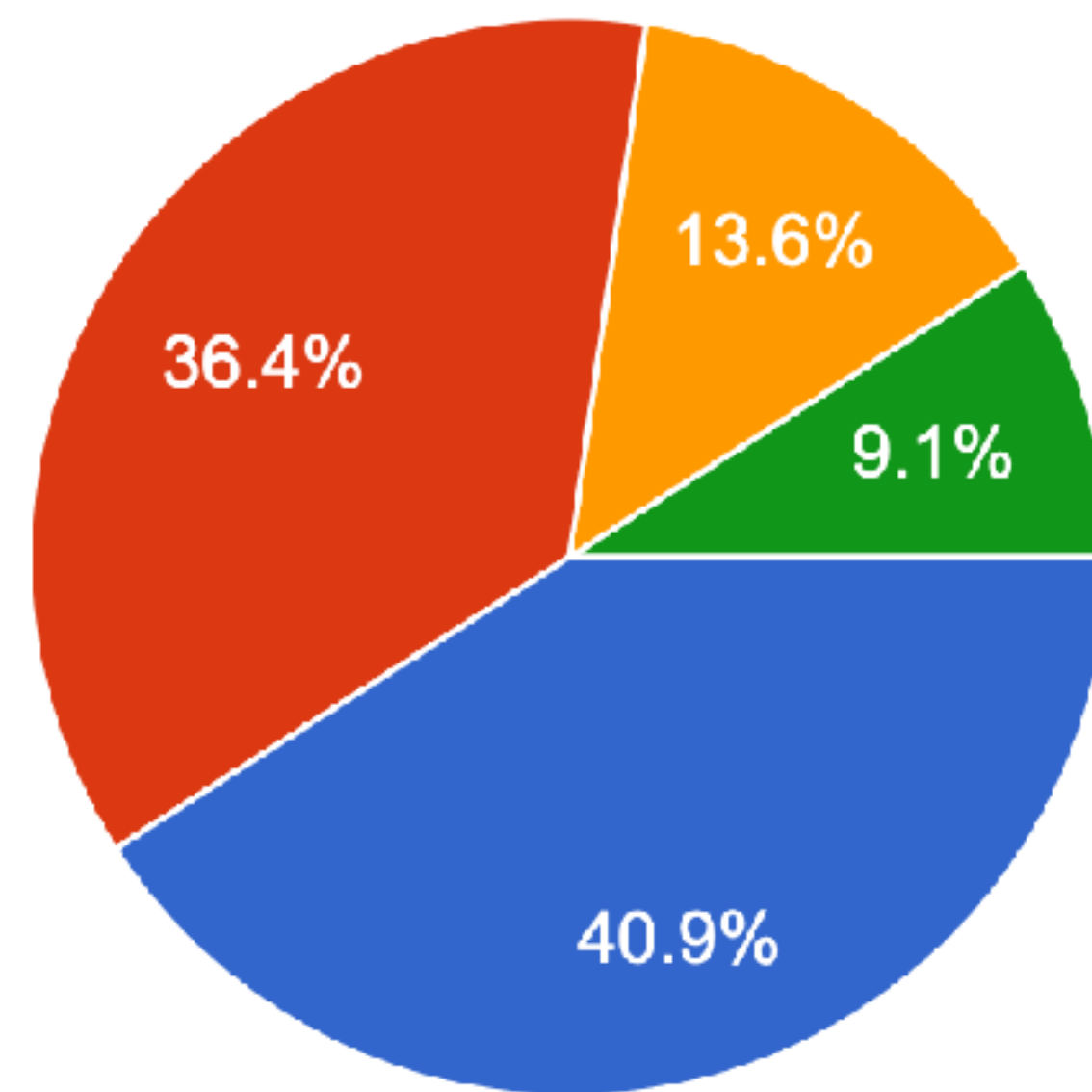22 responses
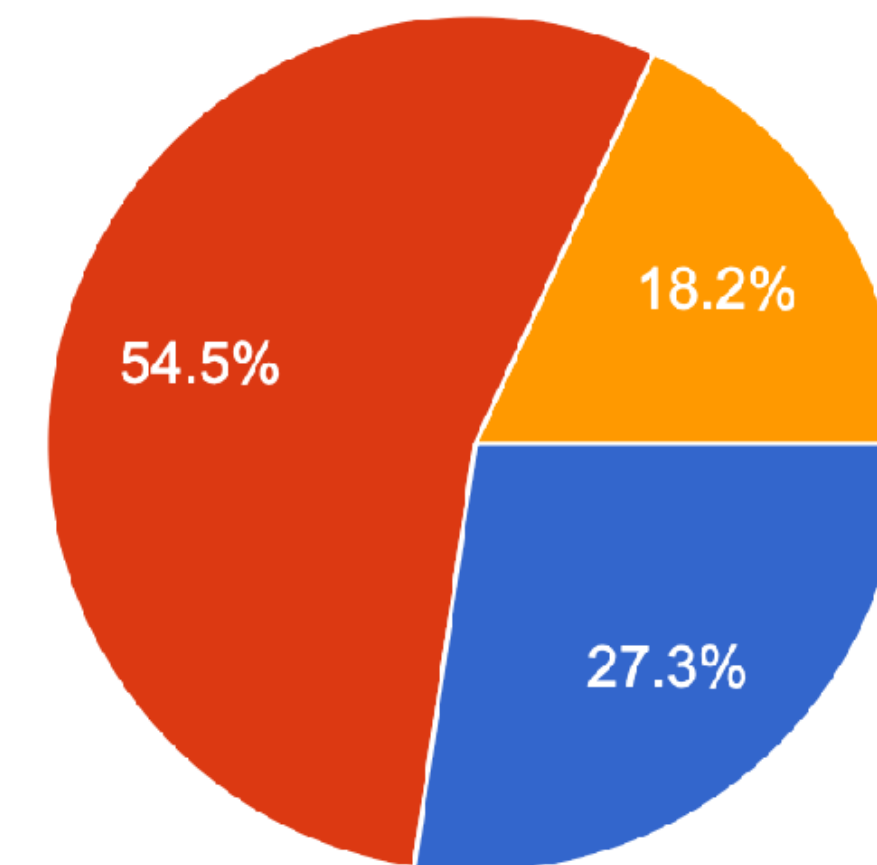
- I am already aware of subMIT & use it.
- I am already aware of subMIT & do not use it.
- I was not aware of subMIT

Major barriers to subMIT are mainly 'human', not hardware!

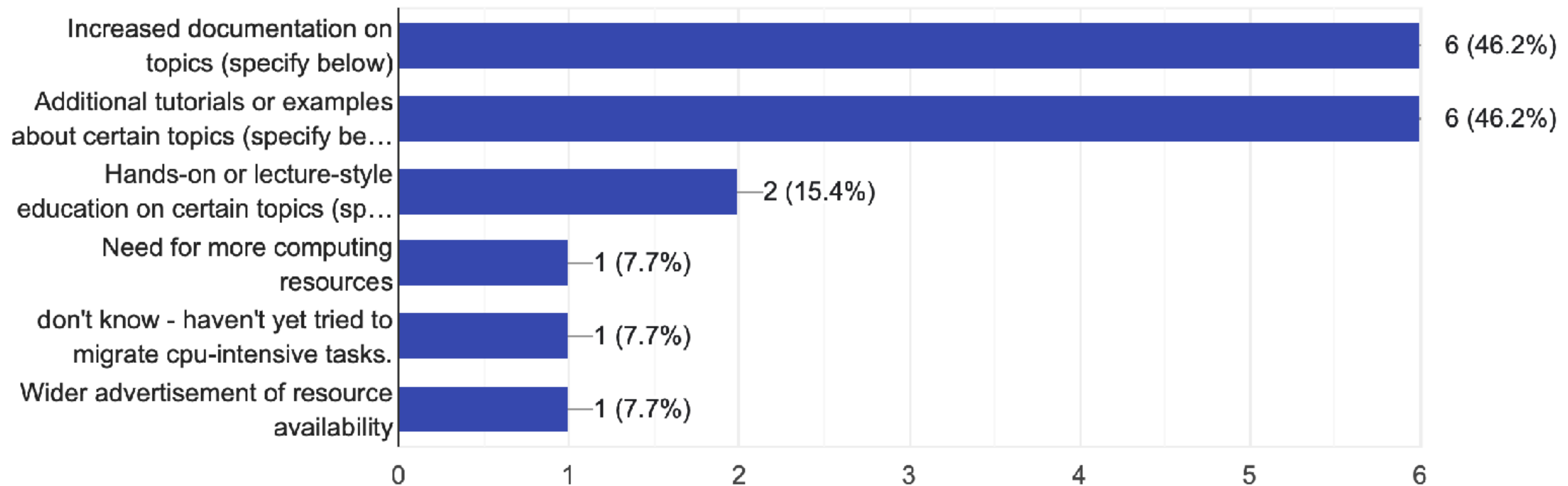How many cores do you use to perform your current work?

22 responses

Major barriers to subMIT are mainly 'human', not hardware!

Which of the following would make subMIT better suit your own needs?

13 responses

Category	Count
Increased documentation on topics (specify below)	6 (46.2%)
Additional tutorials or examples about certain topics (specify be…	6 (46.2%)
Hands-on or lecture-style education on certain topics (sp…	2 (15.4%)
Need for more computing resources	1 (7.7%)
don't know - haven't yet tried to migrate cpu-intensive tasks.	1 (7.7%)
Wider advertisement of resource availability	1 (7.7%)

User onboarding

- subMIT provided a **user support and onboarding IAP course** for MKI and the wider physics community in early February (around 2 hours).

- This was **very well attended** (40-50 participants in a hybrid mode) and **well received within the department**.

- Led to a number of **follow ups within MKI** for **additional onboarding** assistance.

From Laptops to High Performance Computing: Low-Hanging Fruit in Parallelization
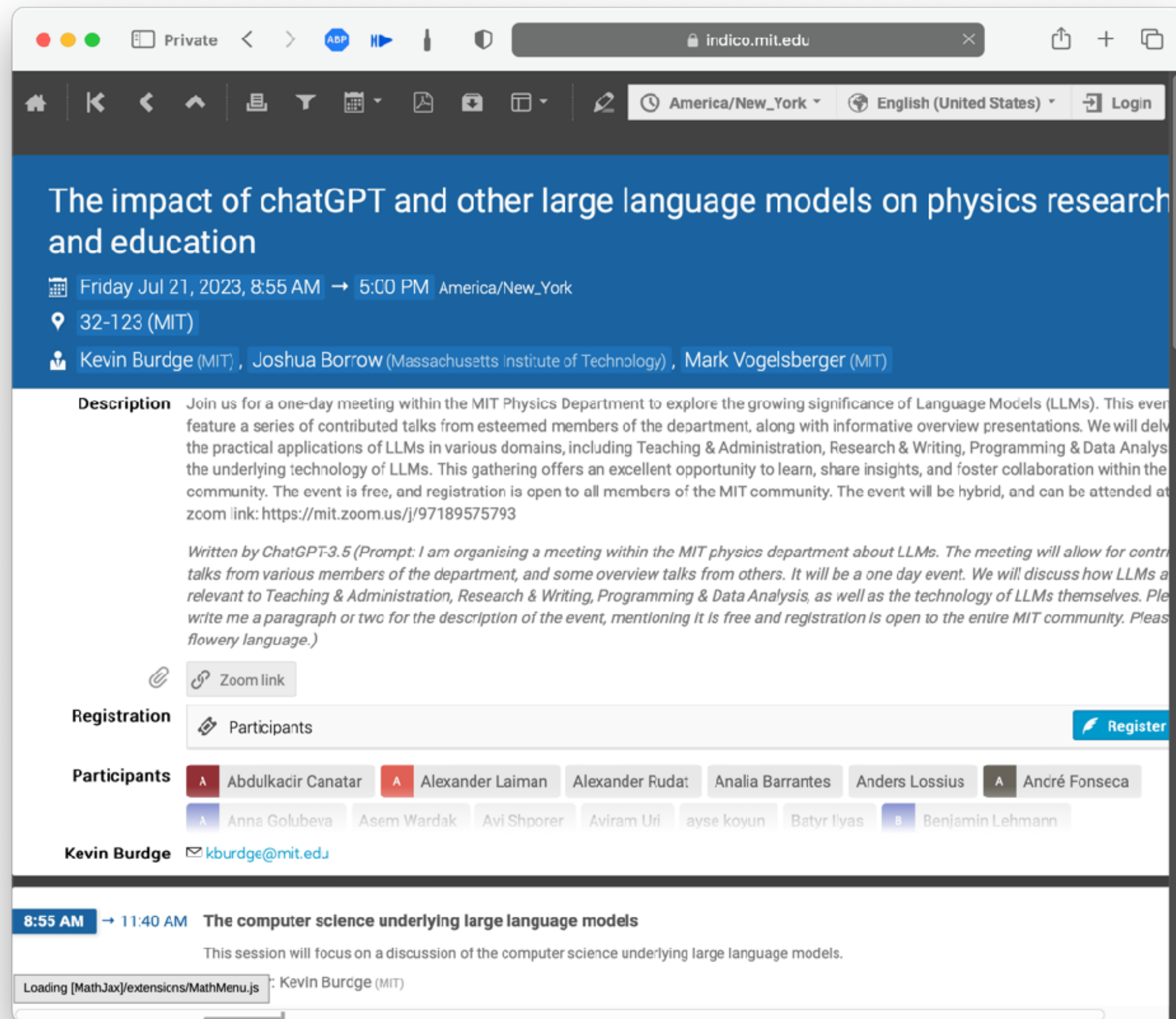
Matt Heine

mheine@mit.edu
37-410: Wednesdays (all day), Thursdays (afternoon)
submit.mit.edu

Community building
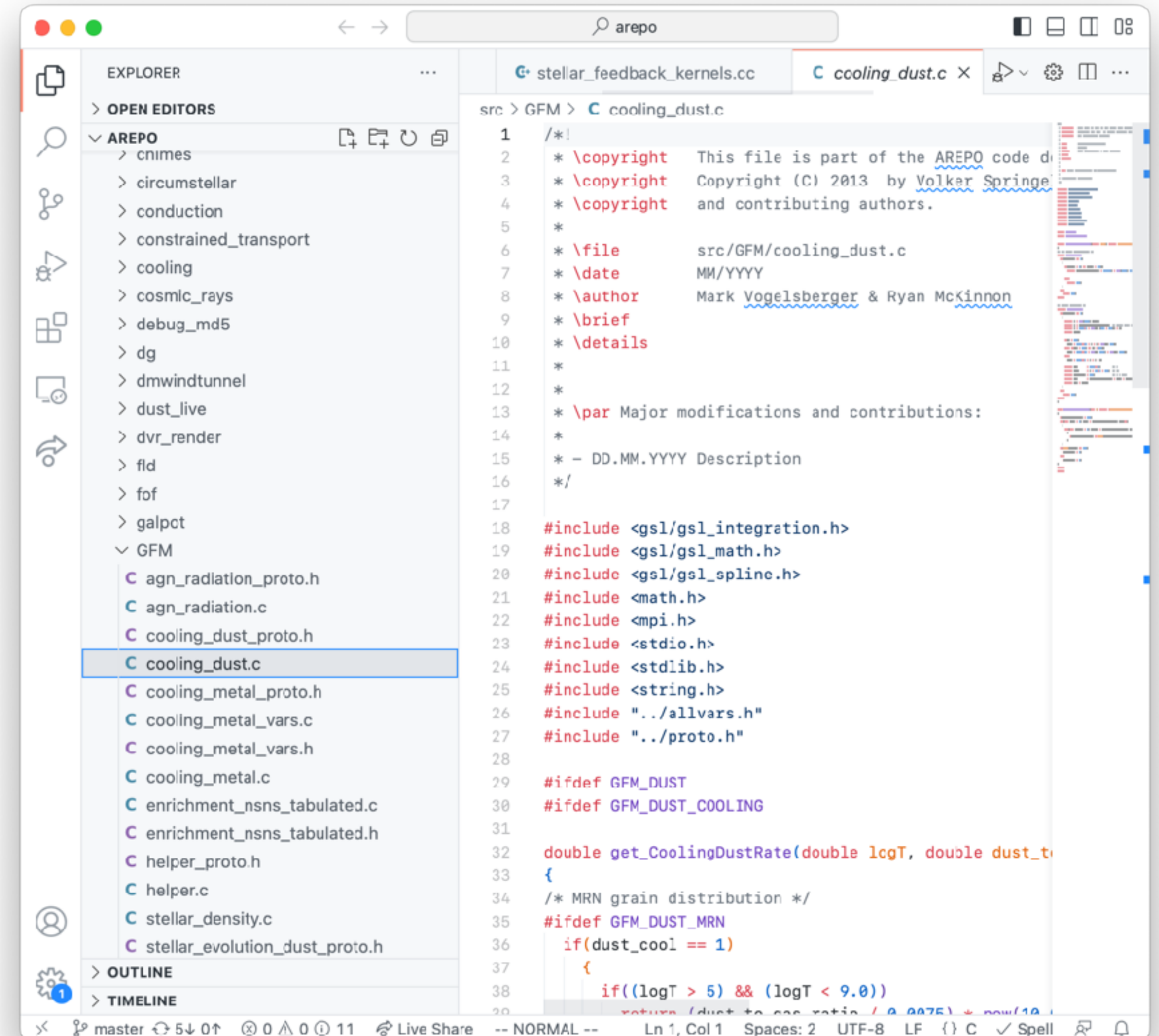
- MKI is leading a department-wide computing meeting on the use of **Large Language Models**.

- Looking forward to developing future user-focused computing meetings through subMIT.

User training

- Based upon **user feedback**, we are developing a **user training session** for the use of **Visual Studio Code** (VSC).

- The focus of the session will be both using **VSC locally** and **remotely through subMIT** and other MIT machines.

- **Training planned** for in **Sept/Oct** once new graduate students join.

Conclusions

- subMIT has been actively engaging with the MKI & wider Physics community, providing **direct user support**, **onboarding of users**, and **targeted training sessions**.

- **MKI's research activities** are **very suitable** for **subMIT's architecture**.

- **More community engagement is needed**, but the **future looks very bright** for **MKI research on the subMIT facility**.