A3D3 High-Throughput AI Methods and Infrastructure Workshop

Hackathon Challenge Introduction

Accelerated AI Algorithms for Data-Driven Discovery

July 12-14 2023

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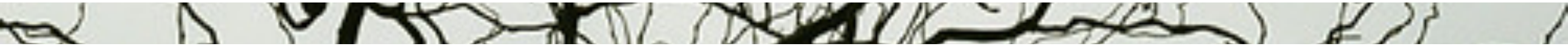
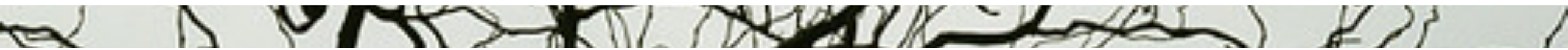
Motivation & Goals

- A3D3 is about fostering interdisciplinary collaboration and idea exchange
- This hackathon takes 3 active research challenges from Neuroscience, Multi-Messenger Astronomy, and High Energy Physics and challenges you to come up with solutions
- You will form teams from various carrer levels, research areas and institutions and brainstorm approaches to these challenges
- Goals:
  - Foster interdisciplinary collaboration
  - Innovate creative solutions to active research challenges
  - Learn about widely applicable ML tools & infrastructure
  - Have fun!



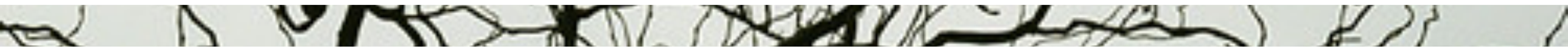
Projects

- We have 3 projects featuring current research challenges in their respective fields:
    - Neuroscience: Brain signal classification from touch stimulus in mice
    - MMA: Classifying astrophysical sources from the ZTF telescope
    - HEP: Real-time anomaly detection with CERN open data
- Will introduce projects in next presentations
    - You will be provided with datasets, code examples, and some ideas to get you started
    - Every team will include people who actively research the challenge topic!



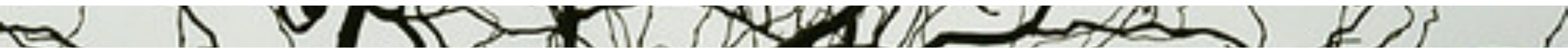
Team Formation

- 3 teams for the 3 challenge topics (Neuro, MMA, HEP)
- You can choose to participate in any one of these projects**
- All backgrounds, career levels, areas of expertise welcome!
    - We highly encourage you to join a project outside of your own field!!
- **We may ask you to switch groups in order to ensure roughly equal team sizes and mix of experience levels



Outcomes & Expectations

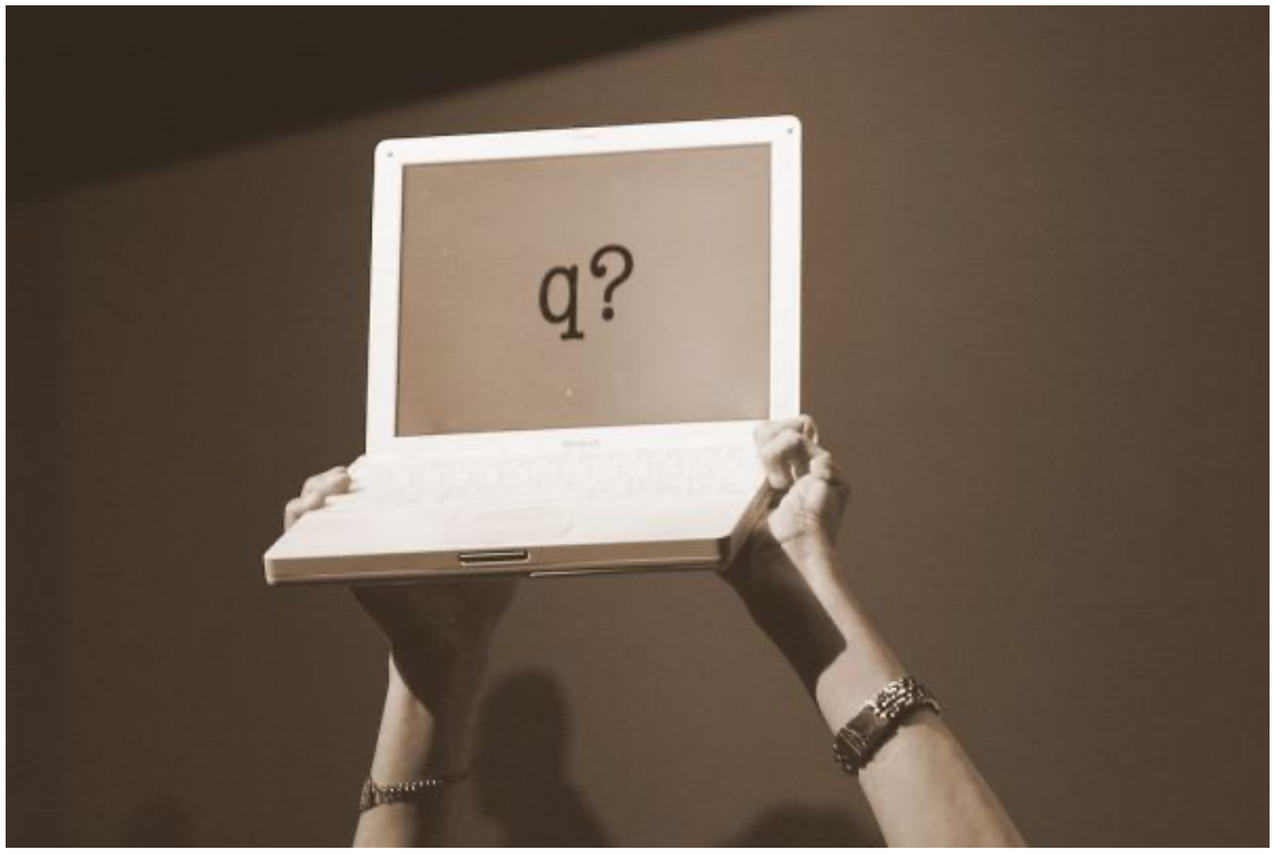
- You are NOT expected to finish your project by the end of this workshop
    - Goal: well defined project strategy and good start + good team communication
    - Tonight at banquet: select spokesperson from your team to give a brief overview of project and team members and any strategy you have managed to discuss today
    - Teams will present their project strategy and progress on Friday
- Idea is to meet semi-regularly with your team to continue your project
- Objective: Present projects next year at A3D3 meet-up!
    - award for best team
    - possibilities: publications???



Expert Consultants

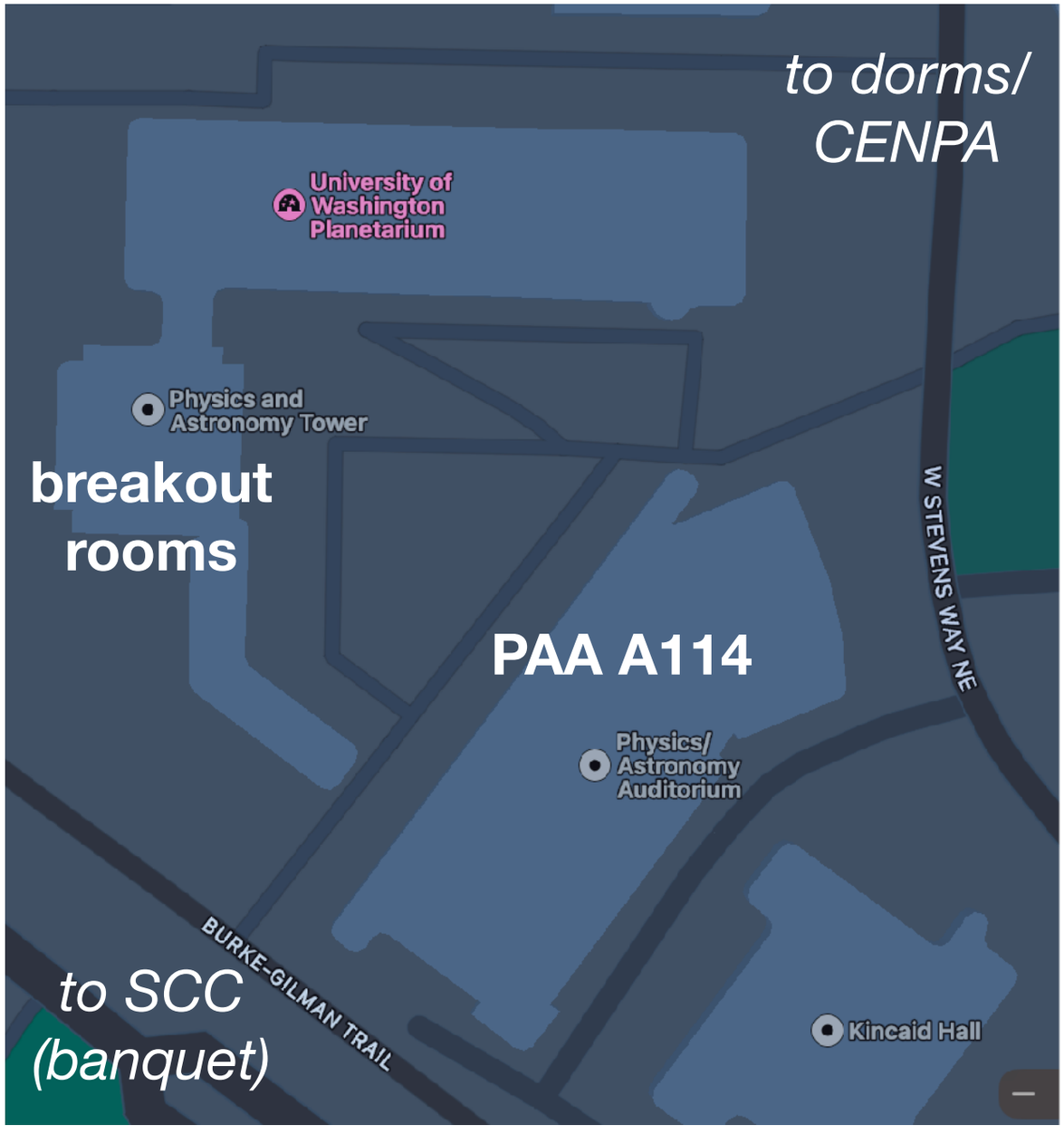
- Thank you to those who volunteered to help out all of the teams where needed as floating helpers!

- Please introduce yourselves, your position, and your area of expertise!!



Breakout Rooms

- Groups can pick among 3 available breakout rooms in the physics and Astronomy tower:
  - C520* - 5th floor, 40 people
  - C521 - 5th floor, 15 people
  - WRF Studio - 6th floor, 20 people
- *2 groups can share C520 if desired
- Consultants can float among rooms as needed



- We will be in these breakout rooms + PAA A114 for the rest of the workshop

Slack Channels

- We have created slack channels for the hackathon in the FastML workspace
    - a3d3-hackathon: general channel for everybody, asking questions of expert consultants
    - Join the channel here (all teams+experts):
- Group specific channels (team members)
    - neuro-hackathon-2023: join here after group formation
    - mma-hackathon-2023: join here after group formation
    - hep-hackathon-2023: join here after group formation

Github

- Each team is required to share their code in a git repo within the a3d3-hackathon git organization: https://github.com/a3d3-hackathon
    - You may choose to create your own fresh repo or fork an existing one (see project introductions)
    - Python/jupyter notebooks recommended
    - Share your github handle on the a3d3-hackathon slack channel so we can add you!

Today

You are here:

- project overview
- form teams
- choose breakout rooms
- start discussion

Today

Up to your team depending on availability

15:00

16:00

17:00

18:00

19:00

Hackathon: Introduction & Group Formation

PAA A114 14:25 - 16:25

Coffee Break

University of Washington 16:25 - 17:30

Special Event: CENPA nuclear physics lab tour (Prof. Alejandro Garcia)

University of Washington 16:40 - 17:30

Hackathon: Initial Group Meetings in Breakout Rooms

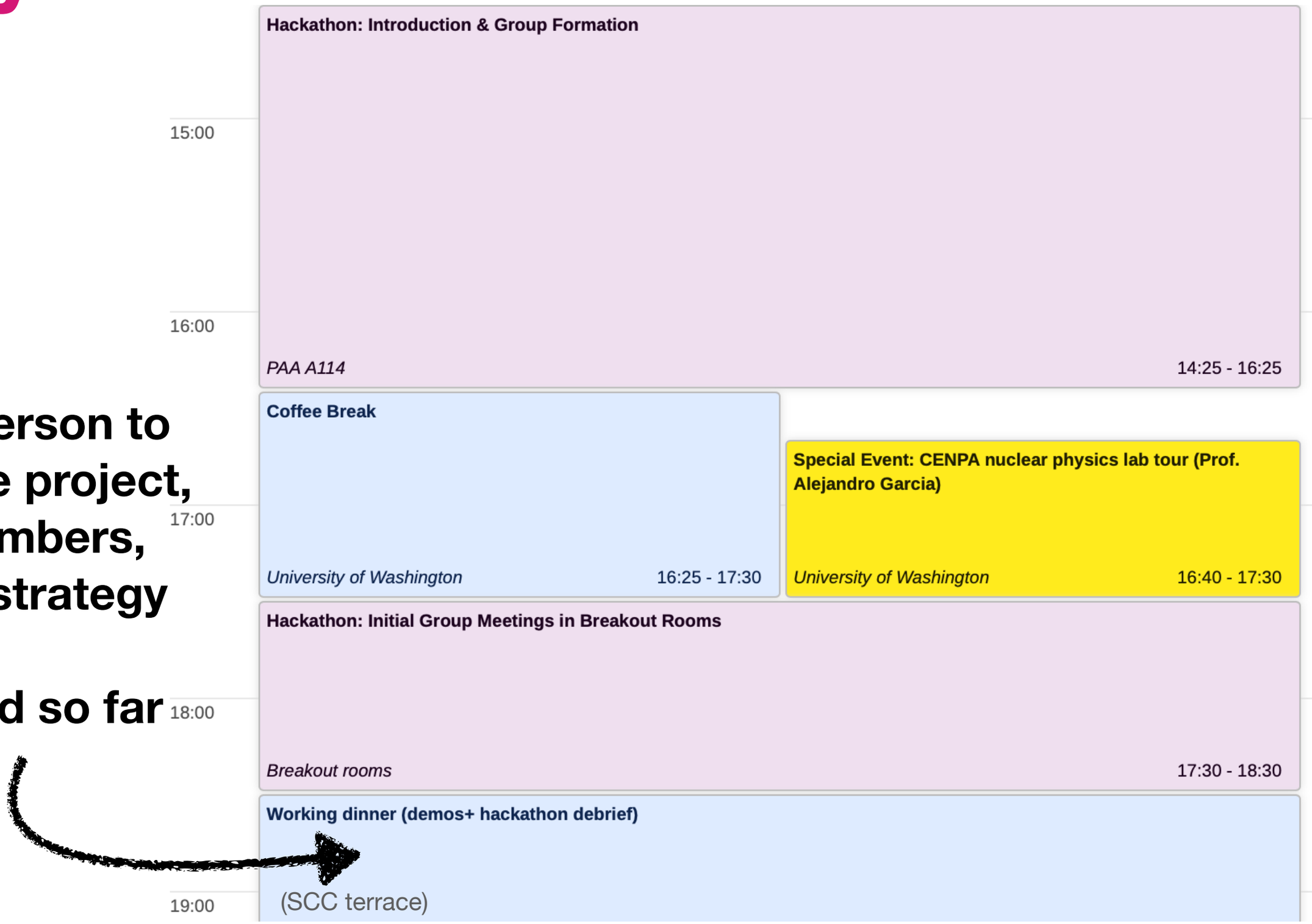
Breakout rooms 17:30 - 18:30

Working dinner (demos+ hackathon debrief)

(SCC terrace)

Today

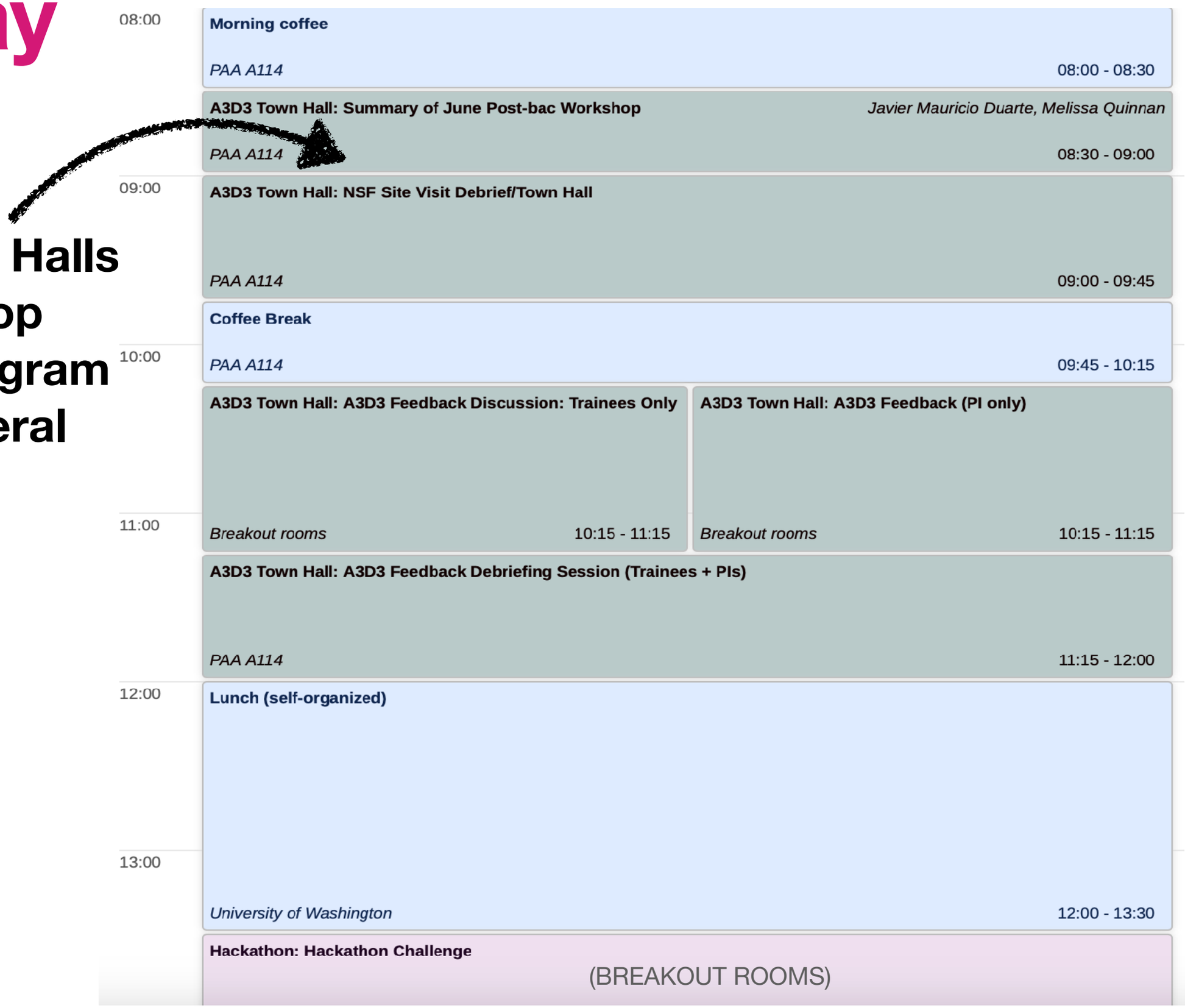
Select spokesperson to introduce project, team members, and any strategy you have discussed so far



Thursday

Morning Town Halls

- this workshop
- postbac program
- a3d3 in general



Thursday

Afternoon dedicated to hackathon!!

- **breakout rooms**
- **experts available**

08:00

Morning coffee

PAA A114 08:00 - 08:30

A3D3 Town Hall: Summary of June Post-bac Workshop *Javier Mauricio Duarte, Melissa Quinnan*

PAA A114 08:30 - 09:00

09:00

A3D3 Town Hall: NSF Site Visit Debrief/Town Hall

PAA A114 09:00 - 09:45

Coffee Break

PAA A114 09:45 - 10:15

10:00

A3D3 Town Hall: A3D3 Feedback Discussion: Trainees Only

Breakout rooms 10:15 - 11:15

A3D3 Town Hall: A3D3 Feedback (PI only)

Breakout rooms 10:15 - 11:15

11:00

A3D3 Town Hall: A3D3 Feedback Debriefing Session (Trainees + PIs)

PAA A114 11:15 - 12:00

12:00

Lunch (self-organized)

University of Washington 12:00 - 13:30

13:00

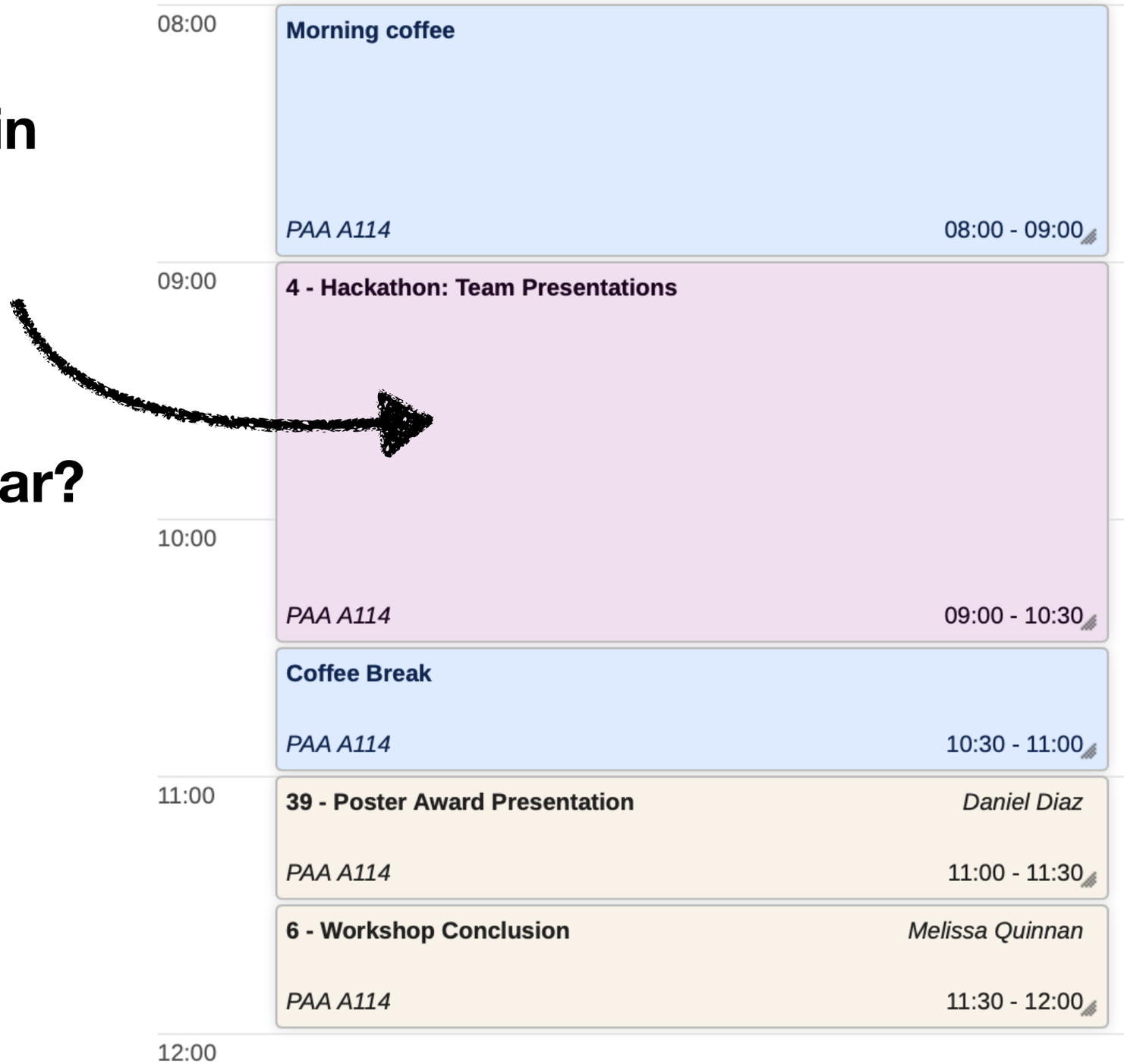
Hackathon: Hackathon Challenge

(BREAKOUT ROOMS)

Friday

Each team gives 20 min presentation:

- **team members**
- **project strategy**
- **major challenges?**
- **progress/status so far?**
- **plan for continuing?**



Conclusion

- Exciting opportunity to get to know A3D3 members from other areas, learn a lot, and make potential real impacts on current research!
    - Up to you to make the most of it
    - Encouraged to join team outside of your scientific discipline!
- Next: learn about projects, join teams, pick breakout rooms
- Don't forget to join github and slack!!!
- Use the experts this week while you have them!!