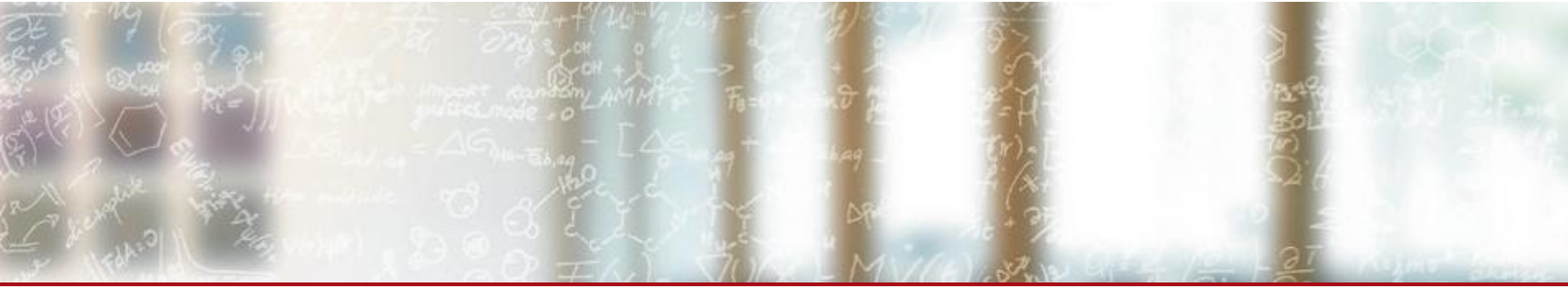
CSCS
Centro Svizzero di Calcolo Scientifico
Swiss National Supercomputing Centre

ETH zürich



SKA & CSCS

Swiss SKA kick-off, 1st December, 2021

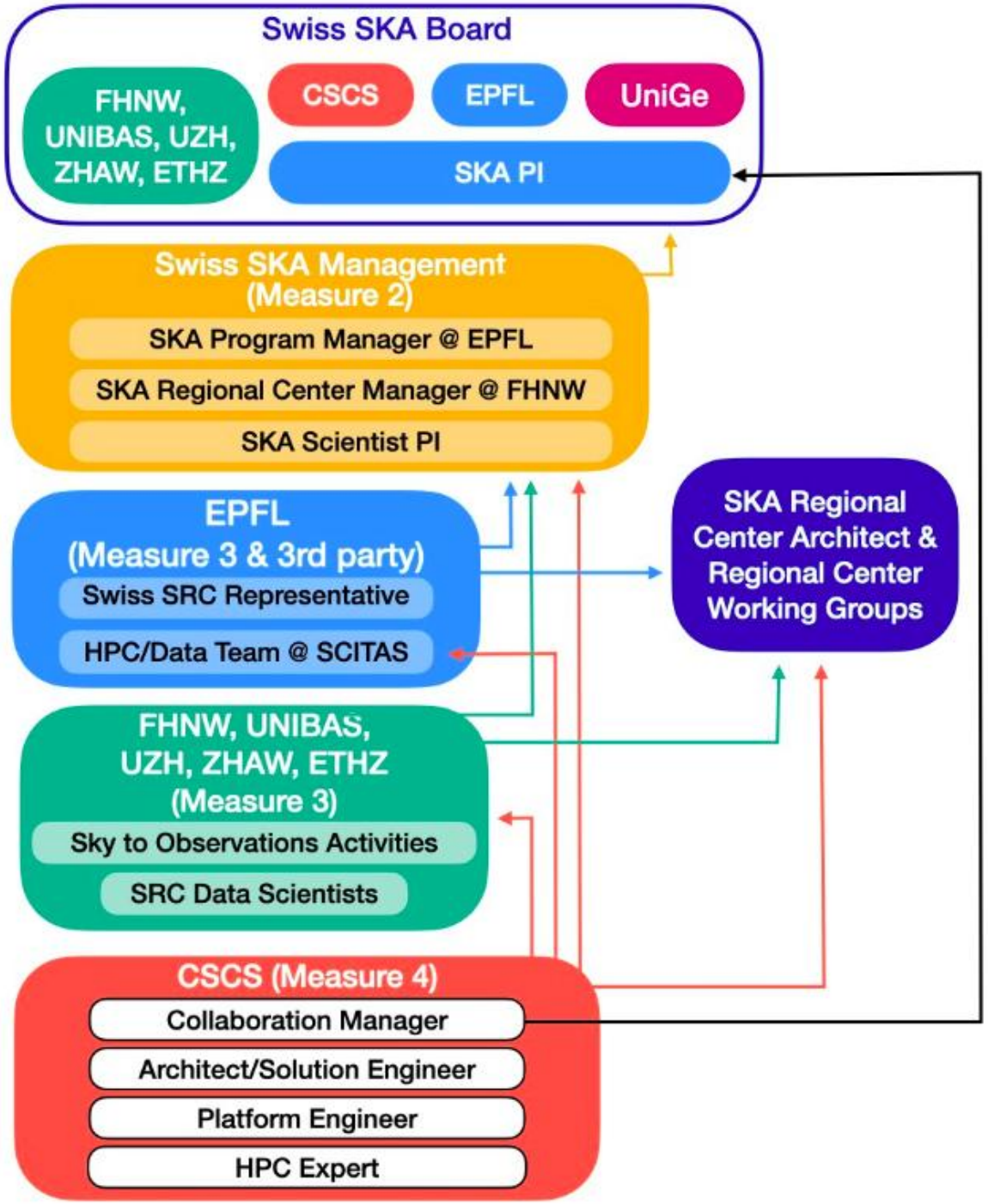
Pablo Fernandez

Summary

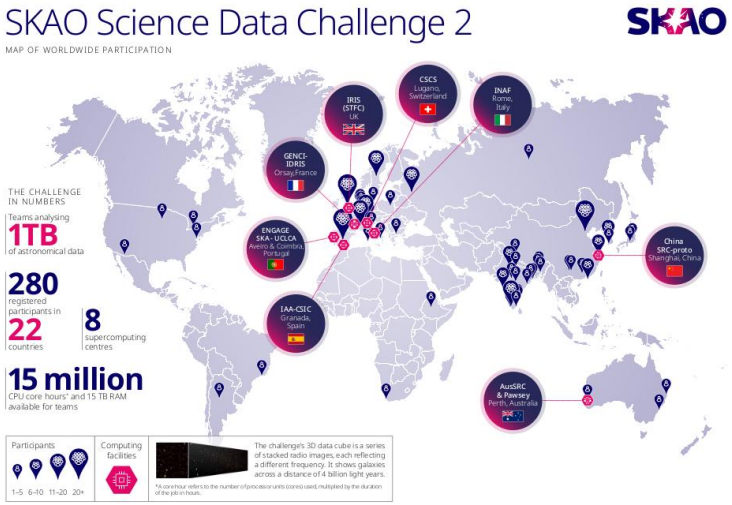
- Present and future activities between SKA and CSCS
- Goals of the collaboration, resourcing
- Our new Alps infrastructure

Goals

- Enable SKA first science use cases, data analysis, and data management projects in Switzerland
  - Through the existing CSCS HPC Platform
  - Preparing existing software to run on resources at CSCS or elsewhere
  - Support writing computing/production proposals.
- Develop and provide a virtual cluster for the first prototype SRC
  - That can connect to the international SRC network
  - Participate in SRC network prototyping activities



Recent activities



- SDC2 data challenge
  - 4/5 projects made it into the leaderboard
  - 180’000 node-hours and 25 TB were distributed, most with GPUs
- 2 PASC software development proposals accepted
  - Overarching goal is to position Swiss computational sciences in the emerging exascale-era. See https://pasch-ch.org
  - To improve scalability of SKA imaging codes
    - https://www.pasc-ch.org/projects/2021-2024/next-generation-radio-interferometry/
  - To develop simulation code for cosmology and astrophysics
    - https://www.pasc-ch.org/projects/2021-2024/sph-exa2
- Negotiations with CTA & SERI (almost) finished
  - Still pending signatures

Platform for Advanced Scientific Computing

SKA WG 5 update

- Helped defined requirements for future SRC
  - Mostly user-centric, L1 requirements
- Joined the Cloud Team
  - Participating in the discussions about the hardware/software testing
  - Following the activities related to the system requirements
- Shown interest in two prototypes
  - Prototype 1: Data products replication, distribution, and synchronization across multiple locations
  - Prototype 2: Federated Authentication and Authorization API

Next steps

- Start meeting with SKA-CH individuals and teams
  - Understand role of Regional Center manager & Swiss SRC representative
  - Science teams (e.g. sky-to-observation, data science, digital twins)
  - Get architects to start talking together
- Engage with teams for software development
  - PASC & more
- Hire engineers
  - Important to find synergies with CTA
- Participate in international activities
  - Next data challenges
  - WG5 prototypes
- Understand how to distribute granted compute/storage resources
  - Use resources that are funded but mostly peer-reviewed

Future of Swiss SRC

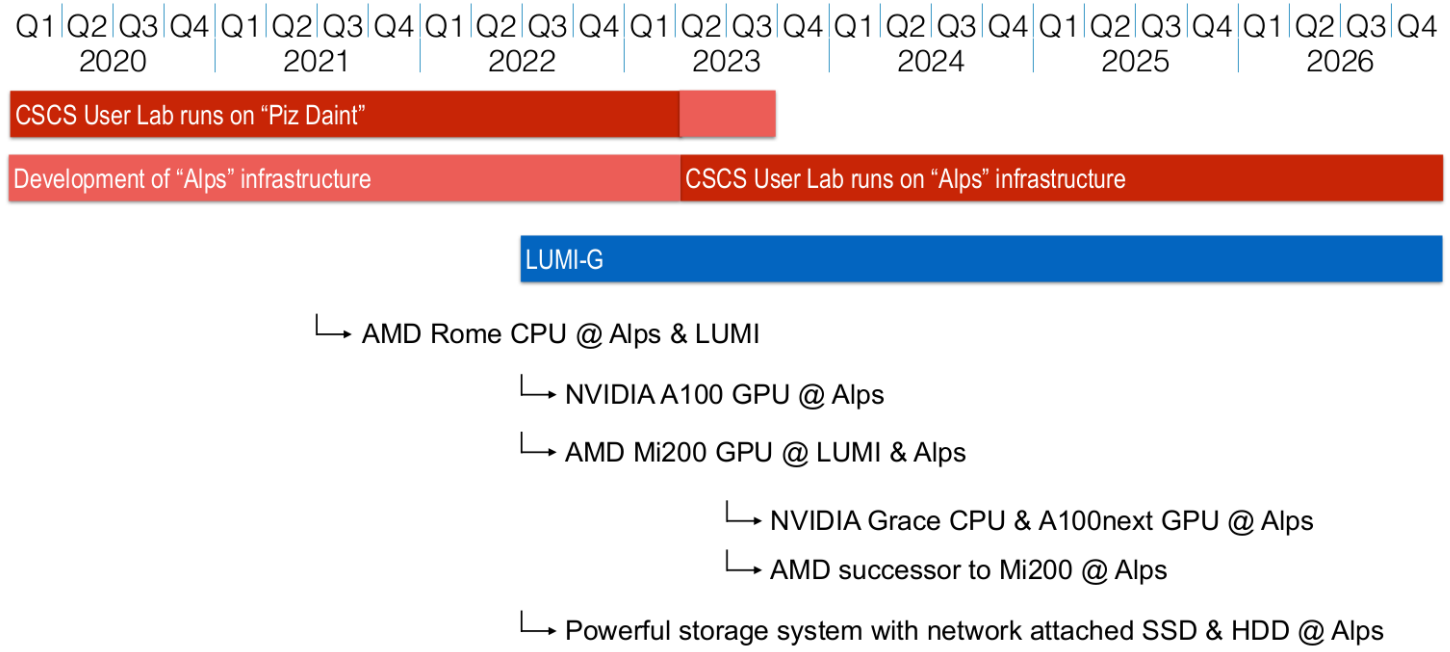
Alps Infrastructure

- Hardware/Infrastructure layer
  - Compute nodes
  - Storage media
  - Network

- Software/Platform layers on top
  - Services (e.g. Slurm, file transfer)
  - User accounts
  - Middleware

  SDC2 challenge ran on the HPC Platform on Piz Daint

- Scientific codes go on top

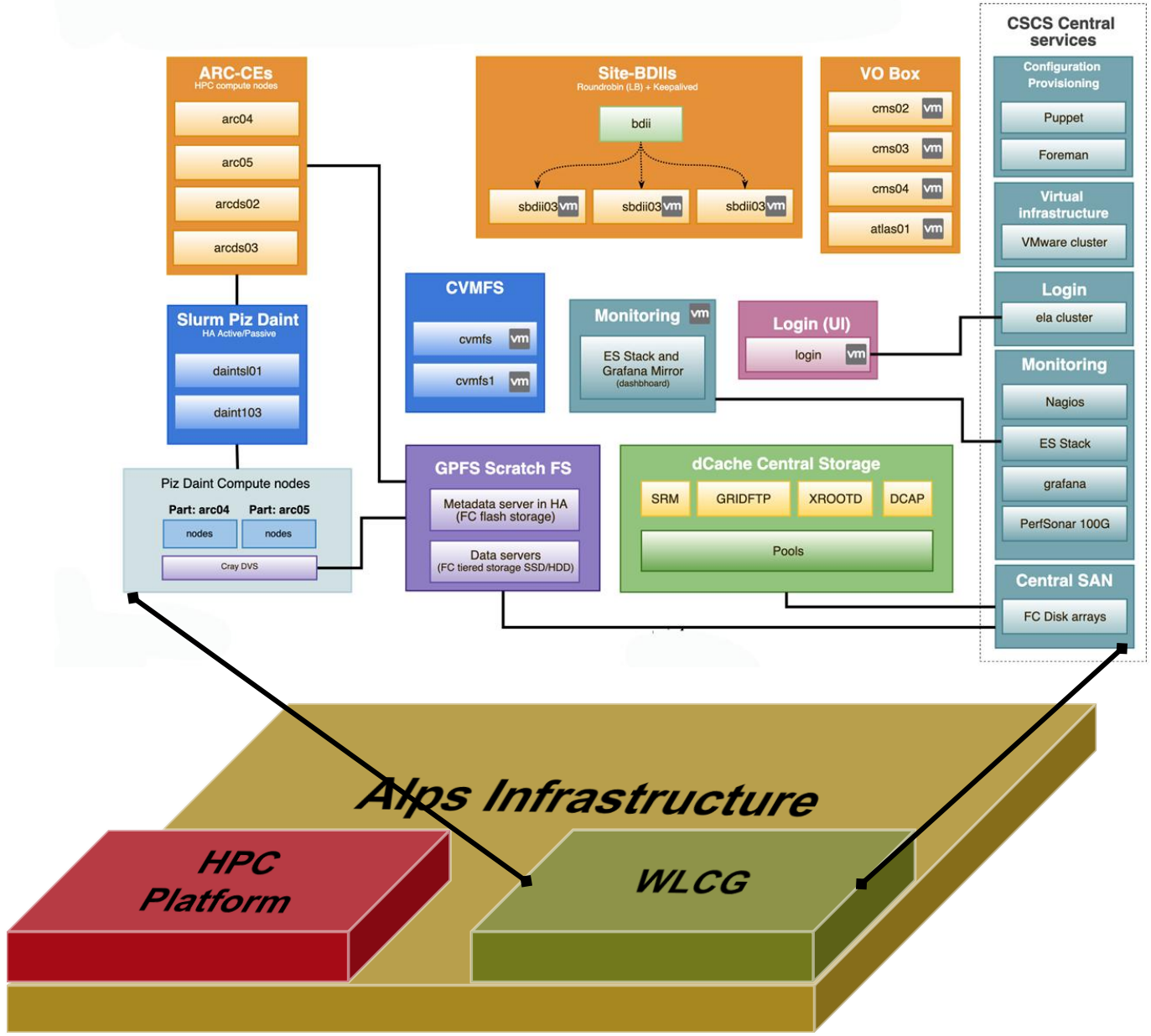


Alps is designed to be extensible with other types of nodes (e.g. Intel CPU & GPU, Fujitsu A64FX, etc.)

We continue to operate a testbed system with all sorts of architectures

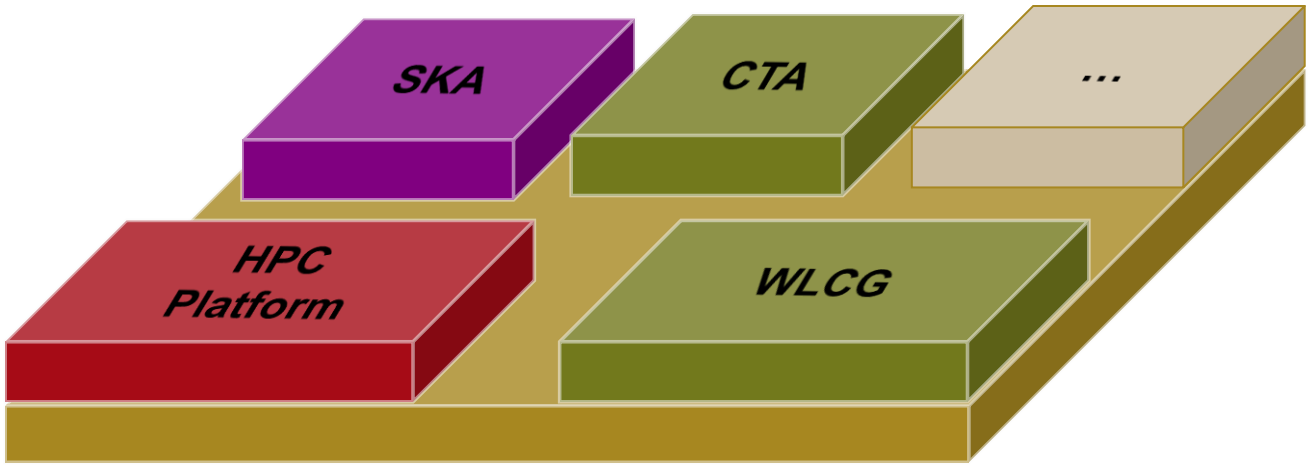
WLCG Grid Middleware layer

- Lots of services to “seamlessly” connect to the WLCG federation
- Collaboration between 4 organizations in order to make things work

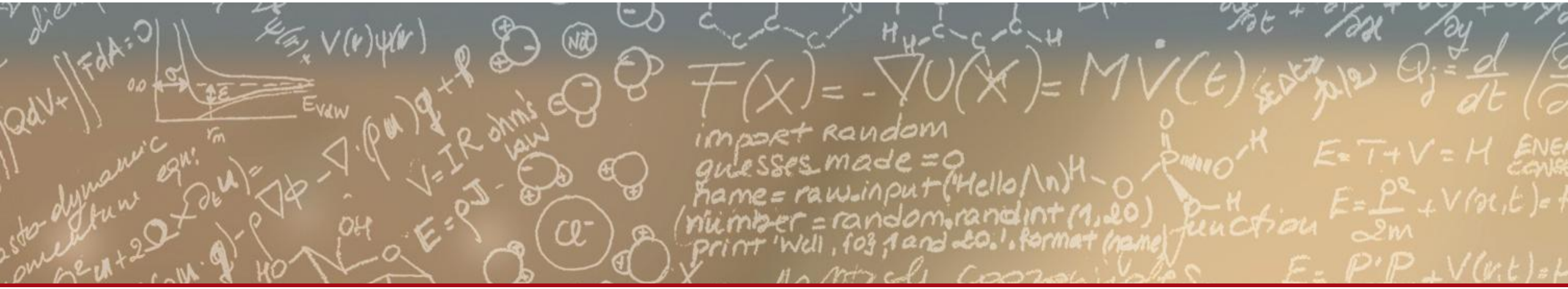


Taking platforms further in Alps

- Very flexible infrastructure that allows for plenty of customization
  - CTA will look very similar to WLCG
- Customization comes at a cost
  - Similar platforms are easier to maintain
- Still early to understand how SKA platform looks like
  - Like WLCG and CTA?
  - Or more IaaS like OpenStack?



Potentially, the SKA virtual cluster could run also elsewhere!



Thank you for your attention.