

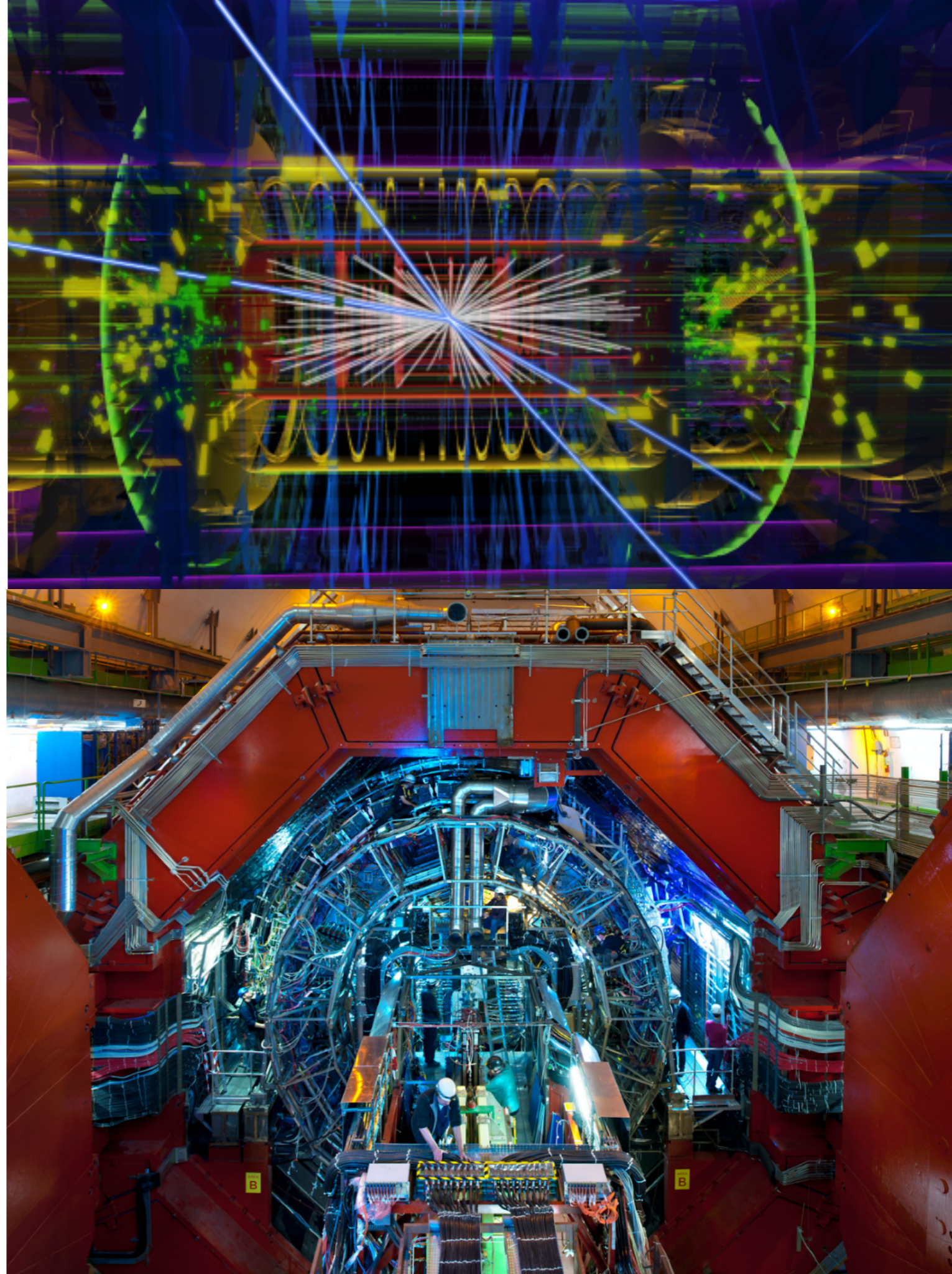
NorCC - Norwegian Centre
for CERN-Related Research

Heidi Sandaker

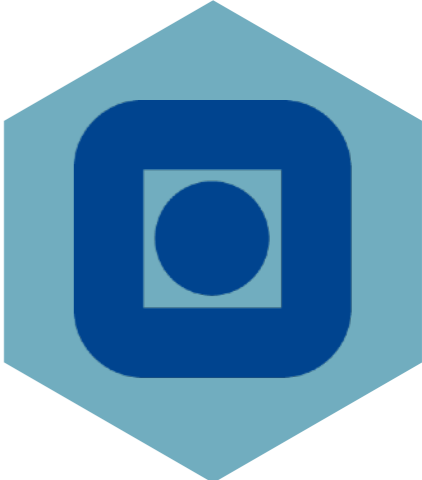
About NorCC

- Established in 2020, collecting several smaller projects in one centre
- 50% financed by RCN, 50% own contribution from the universities
- The funds from RCN are dedicated to long-term participation in experiments at CERN
- Host is UiO, the leader of the centre is from UiO, UiB leads the governing board. Two other institutes participate in GB, today this is NTNU and HVL
- Open for participation from other universities in Norway
- Funds also other work to better take advantage of Norwegian membership at CERN

28.06.2022 - HEIDI SANDAKER



NorCC members



© Vemaps.com

Core Funding goes to ...

*Long term research
at experiments at
CERN*
- frontier research in
particle and nuclear
physics and
technology

*For LHC and HL-
LHC Norway
participate in the
experiments ATLAS
and ALICE*

*Prepare for post-LHC
high energy
accelerator project
(CLIC/AWAKE)*

*Exploiting the low
energy program at
CERN (ISOLDE) and
participation in small-
scale experiments*

*Technology
transfer and
Industrial Liaison*

**... best possible exploitation of the
Norwegian CERN membership**

**Additional funding necessary to reach our research
goals**

- NorLHC- I & II, YTR, FriPro, ...

*Including
Technology
Research*

*Training new
generations of
scientist and
engineers*

Overall organisational structure

◆ 5 research activities

- A1 - Particle Physics
- A2 - Nuclear Physics
- A3 - Accelerator Physics
- A4 - Low Energy Physics
- A5 - Technology

◆ 2 supporting activities

- A6 - Education, Dissemination and Exploitation
- A7 - Management

◆ 2 networks enabling synergies across the research activities

- N1 - R&D Detector and Electronics
- N2 - R&D Computing, Machine Learning and AI

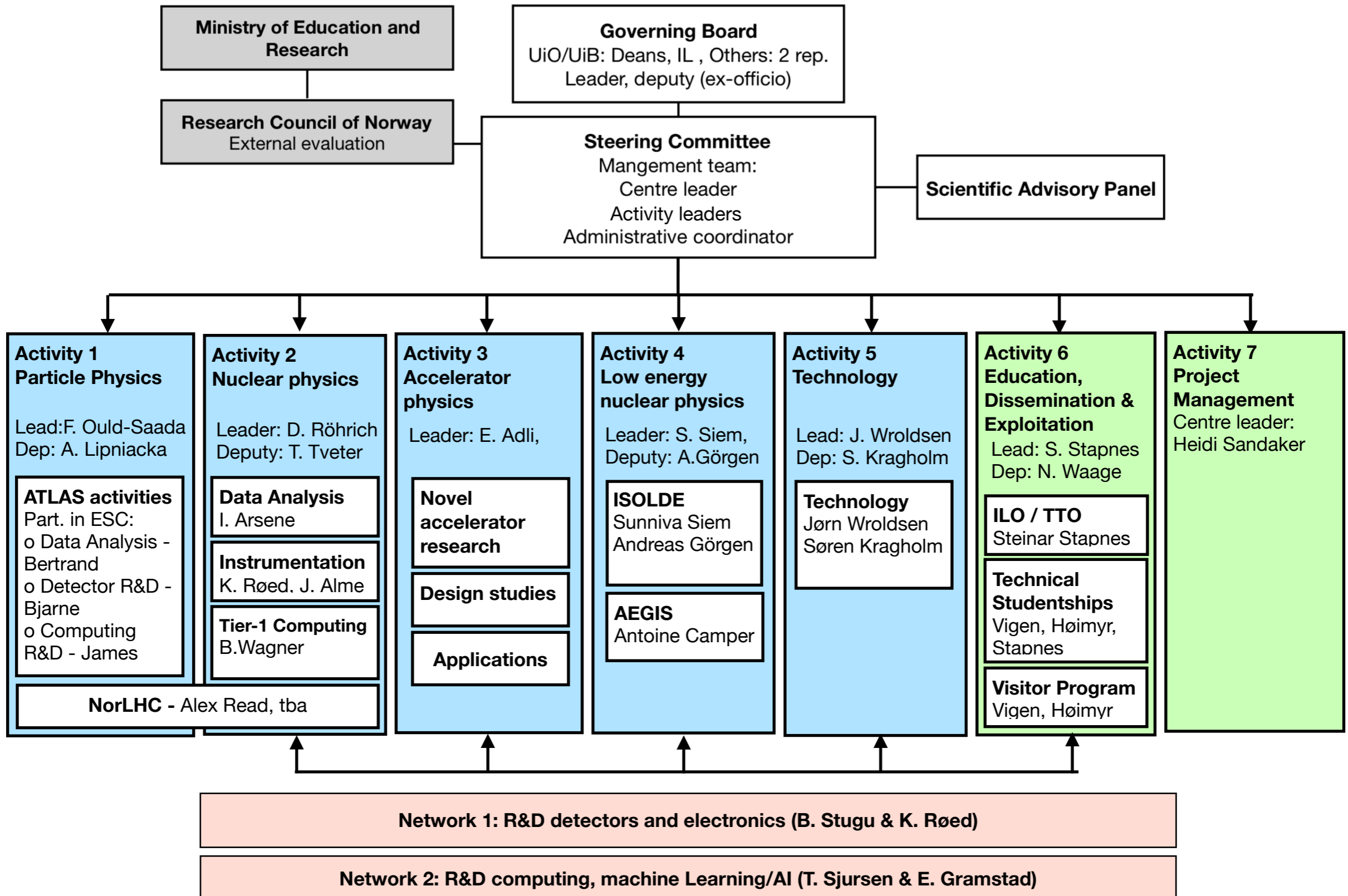
◆ Steering committee (weekly)

- Activityleaders +

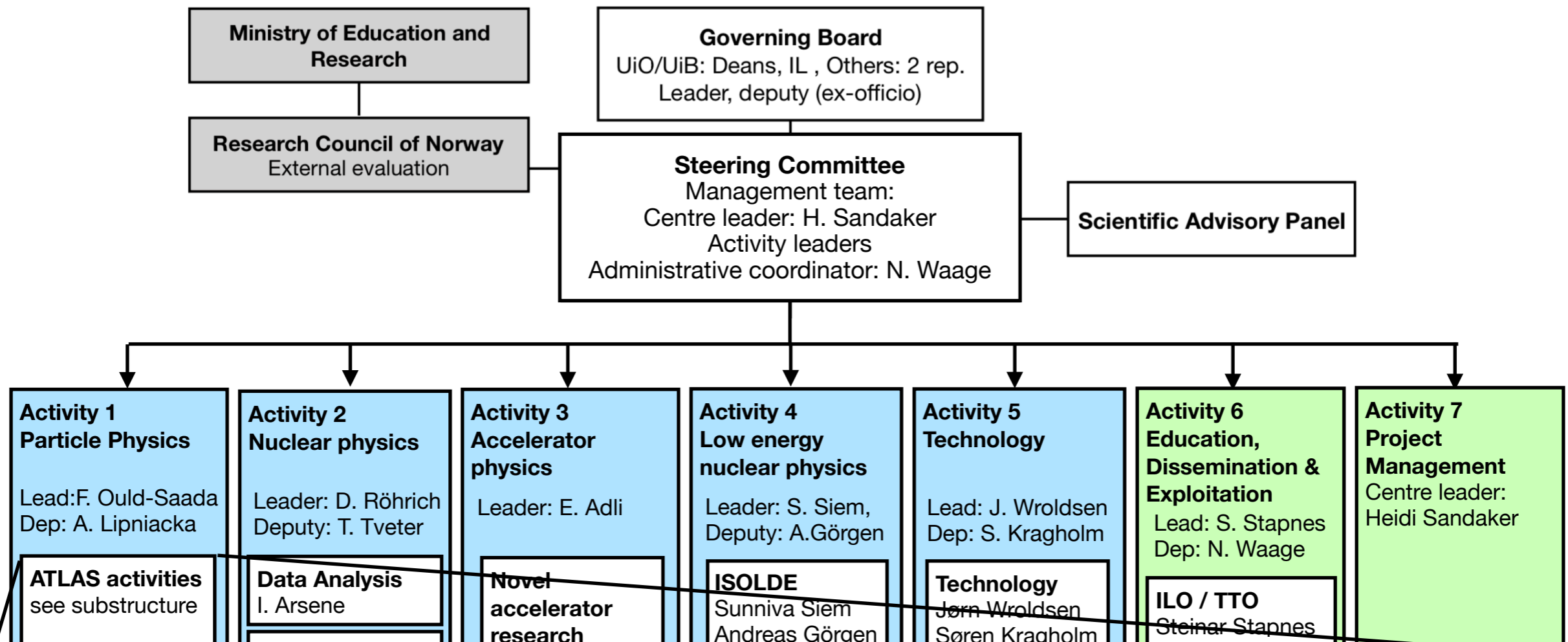
ORGANIGRAM



NorCC Organisation



NorCC organisation

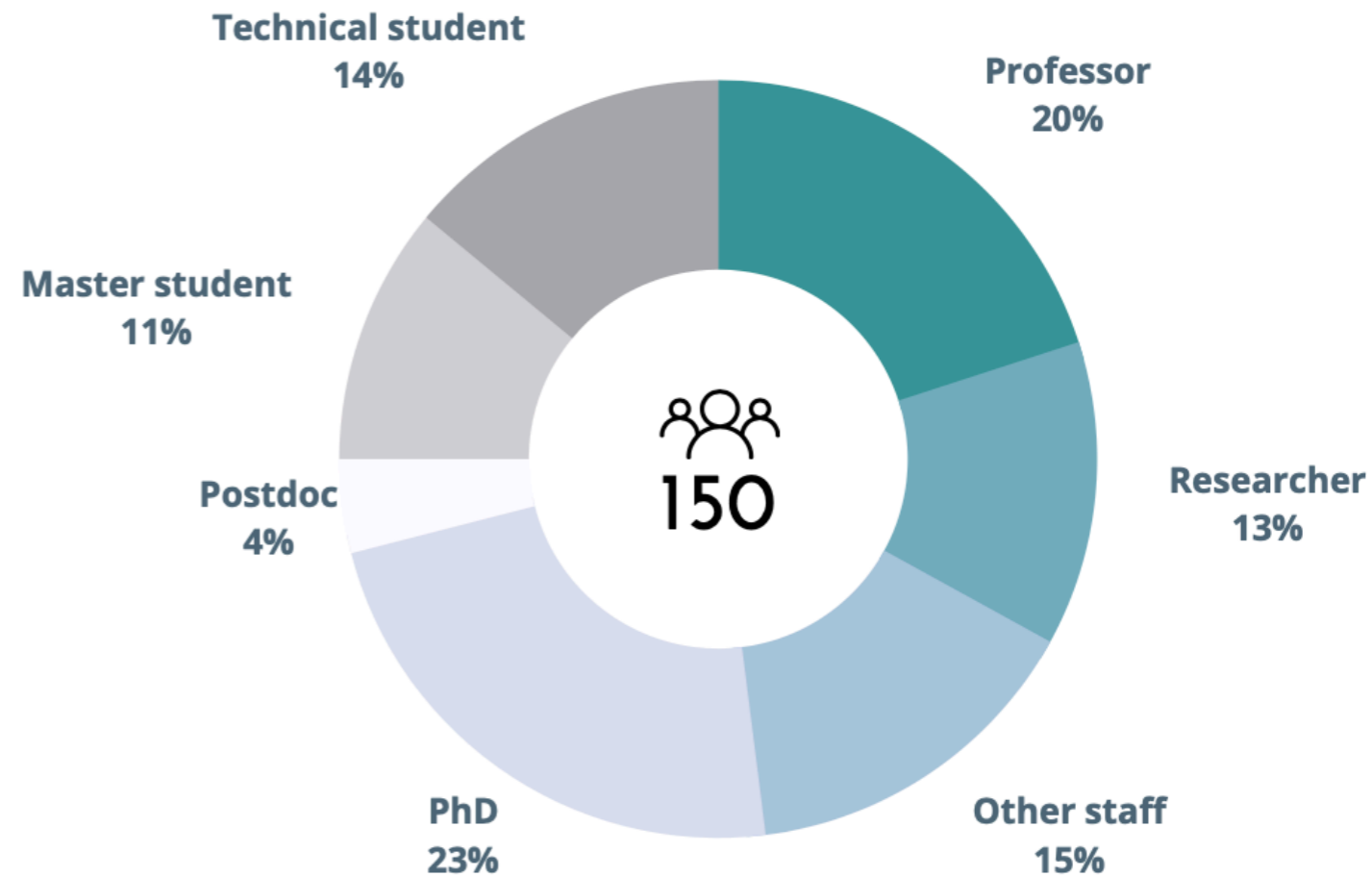
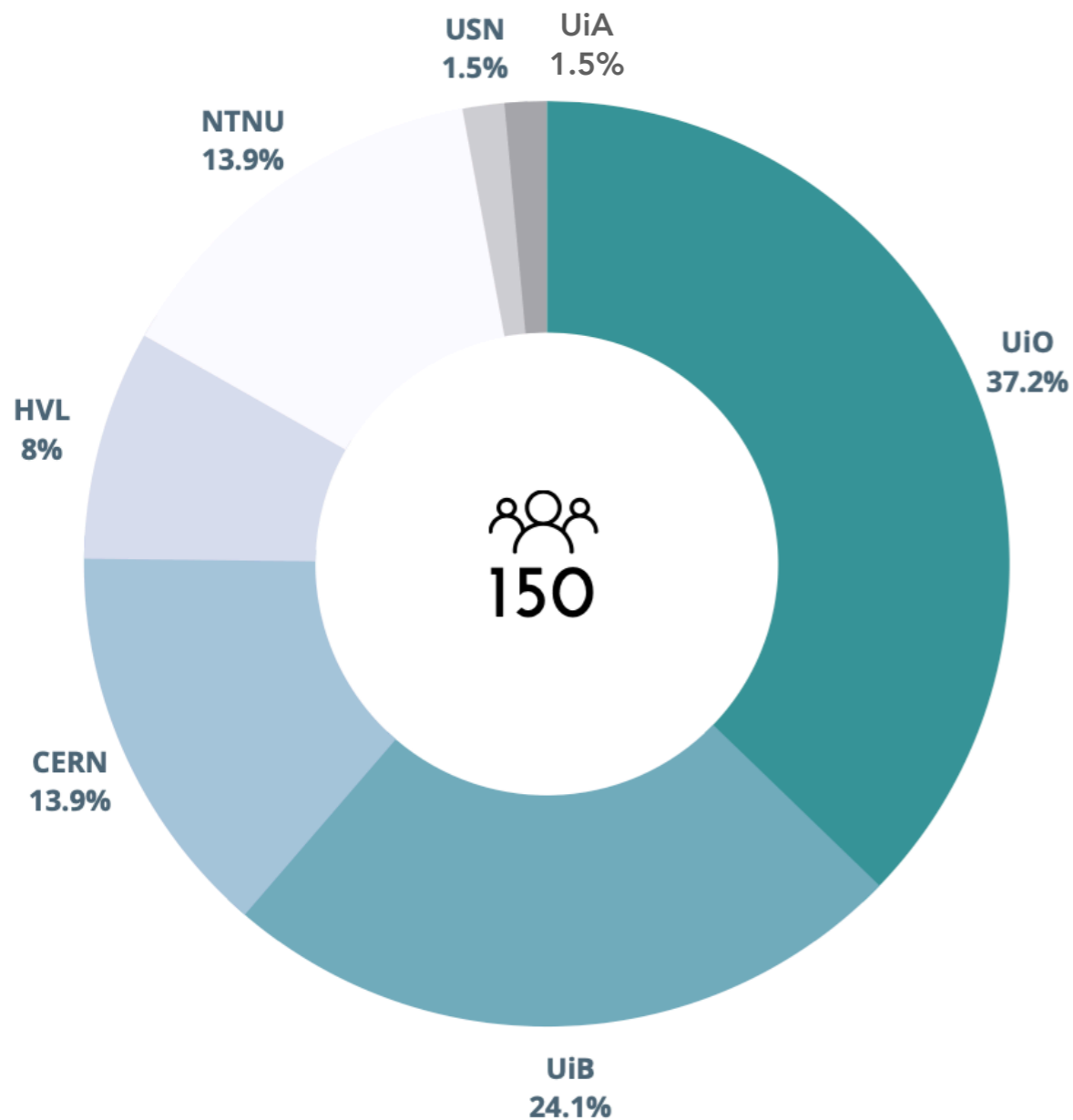


- A1.1 Upgrade: Bjarne Stugu (UiB), Heidi Sandaker (UiO)
- A1.2 Computing: David Cameron (UiO)
- A1.3 Software & Performance: James Catmore (UiO), Bertrand Martin (UiB)
- A1.4 Data exploitation (UiO and UiB)
 - A1.4.1 Higgs & Standard Model: Alex Read (UiO), Gerald Eigen (UiB)
 - A1.4.2 Beyond the SM (SUSY, Exotics, Dark Matter): Eirik Gramstad (UiO), Bertrand Martin (UiB)
- A1.5 Operation Tasks and Qualification Tasks: Farid Ould-Saada (UiO), Anna Lipniacka (UiB)
- A1.6 Education & Outreach: Farid Ould-Saada (UiO), Anna Lipniacka (UiB)

PEOPLE

◆ NorCC is growing in number

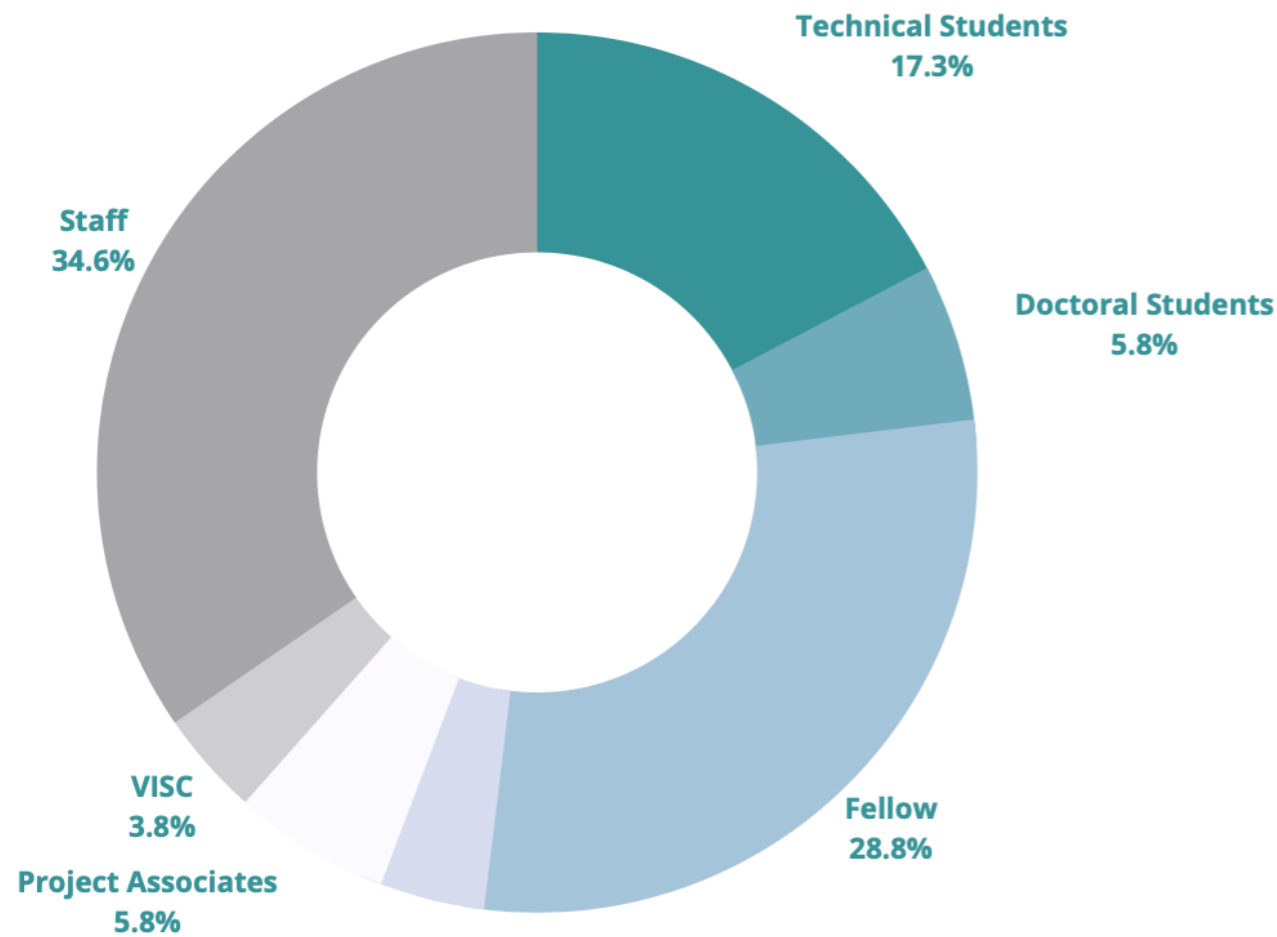
- ◆ Fastest growing NTNU and HVL
- ◆ UiA is expected to follow



◆ Composition

- ◆ About 1 PhD per professor
- ◆ **Obs: Too few master students !**

Snapshot people at CERN

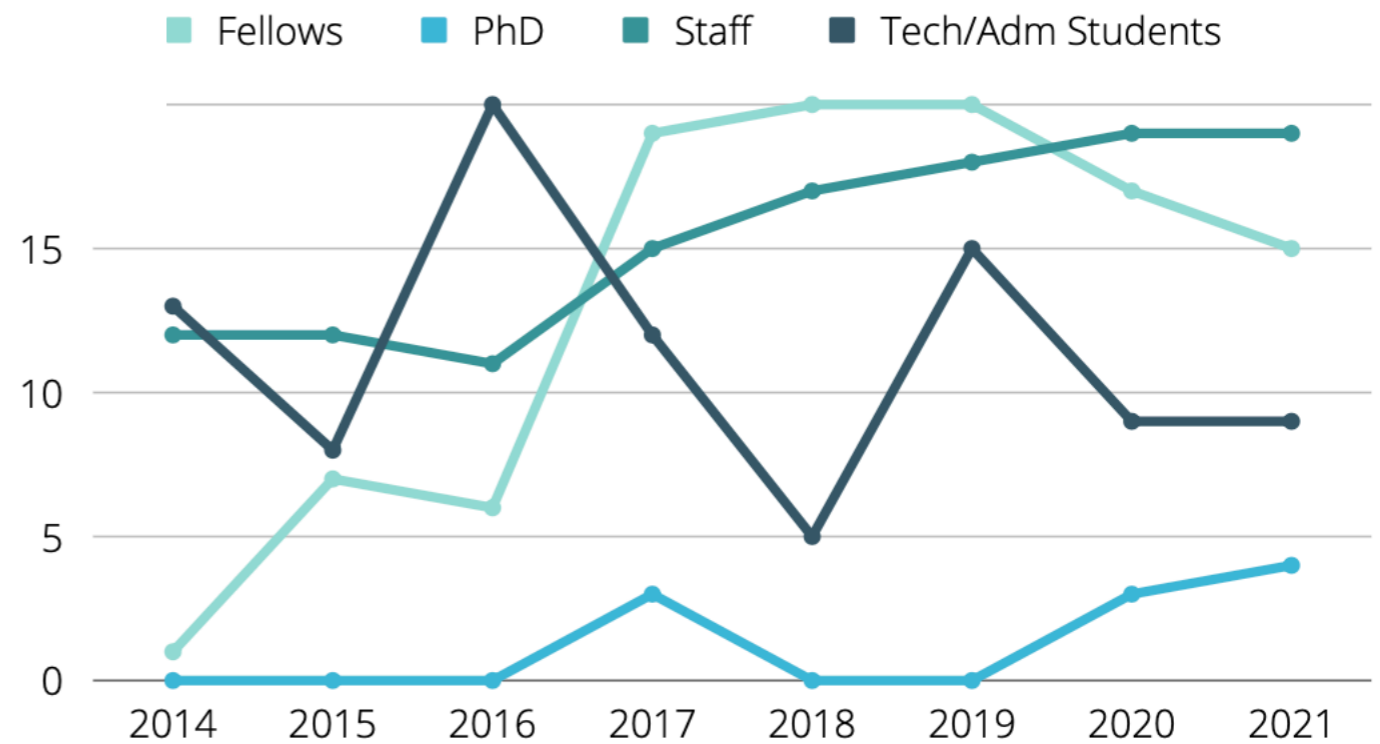


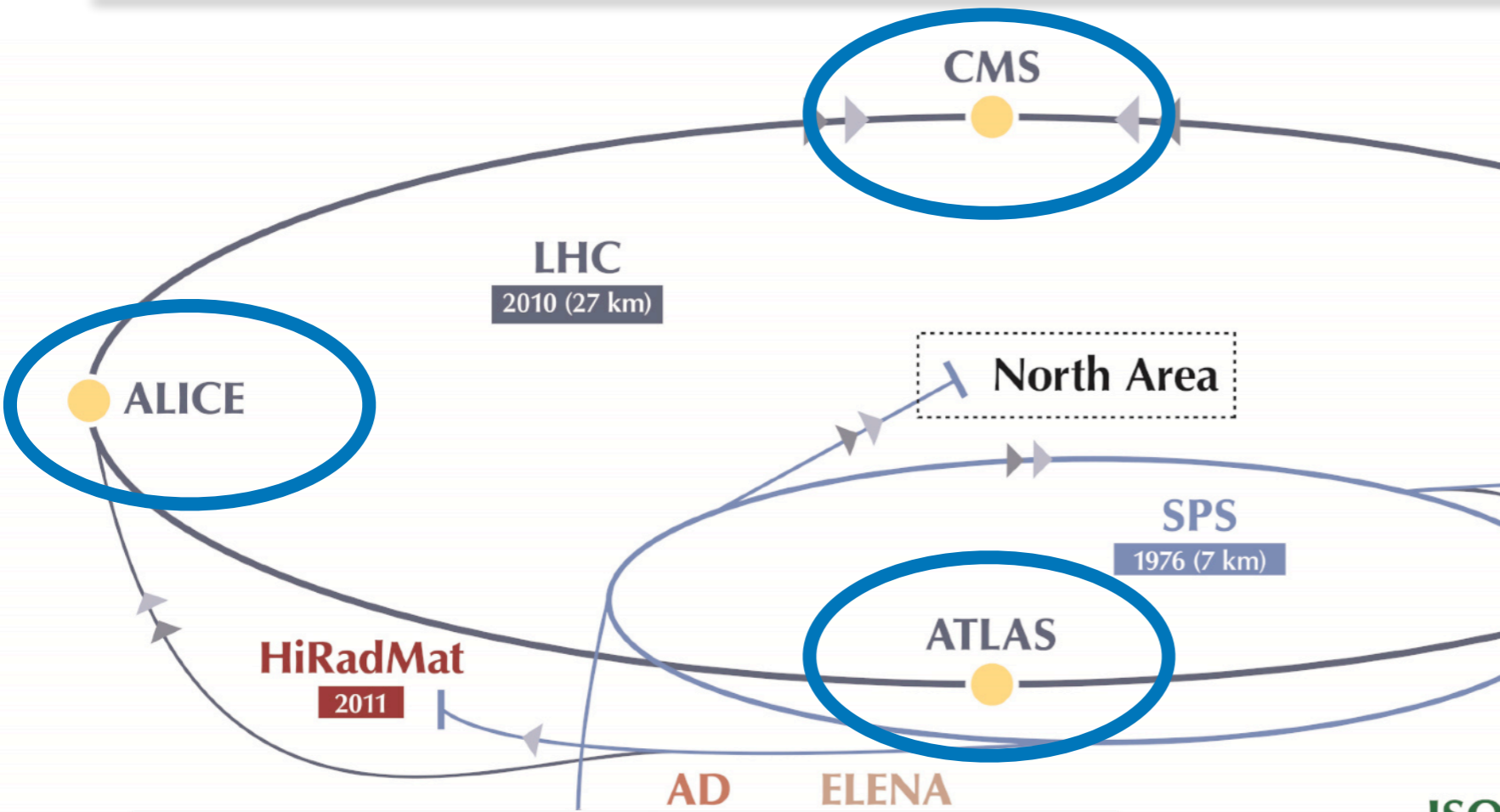
◆ Compositions

- ◆ Largest group is staff, followed by fellows and technical students
- ◆ Typical recruitment path for Norwegians at CERN

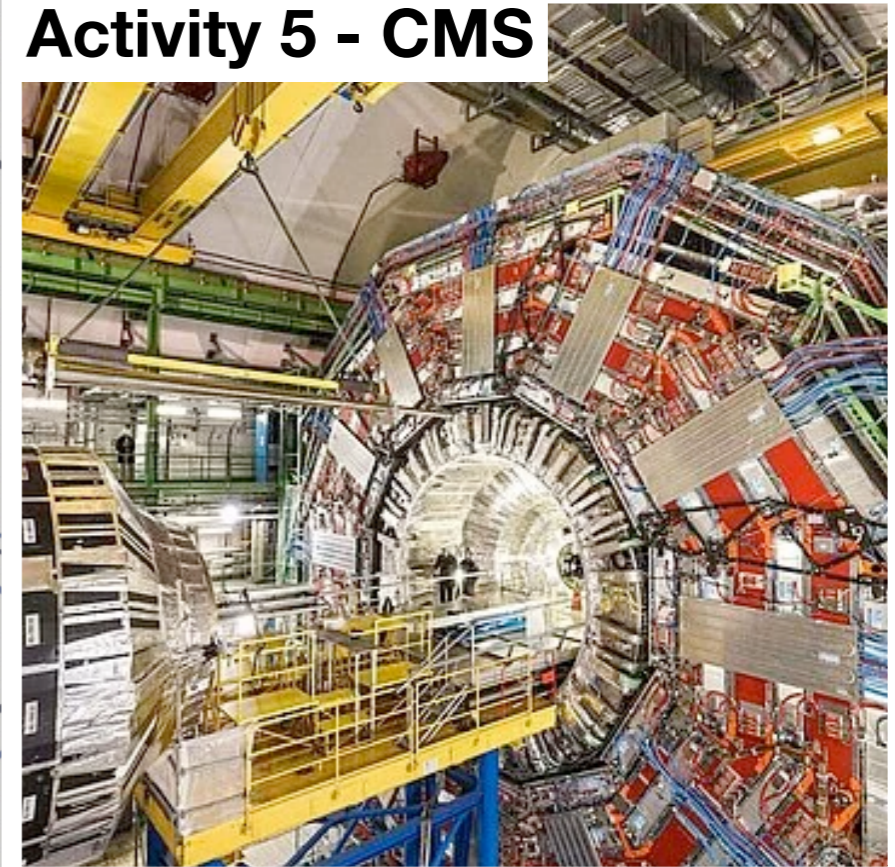
◆ Evolution in time

- ◆ Number of PhDs at CERN increases
- ◆ Fellows go down
- ◆ Staff is increasing towards 20 persons, should be higher





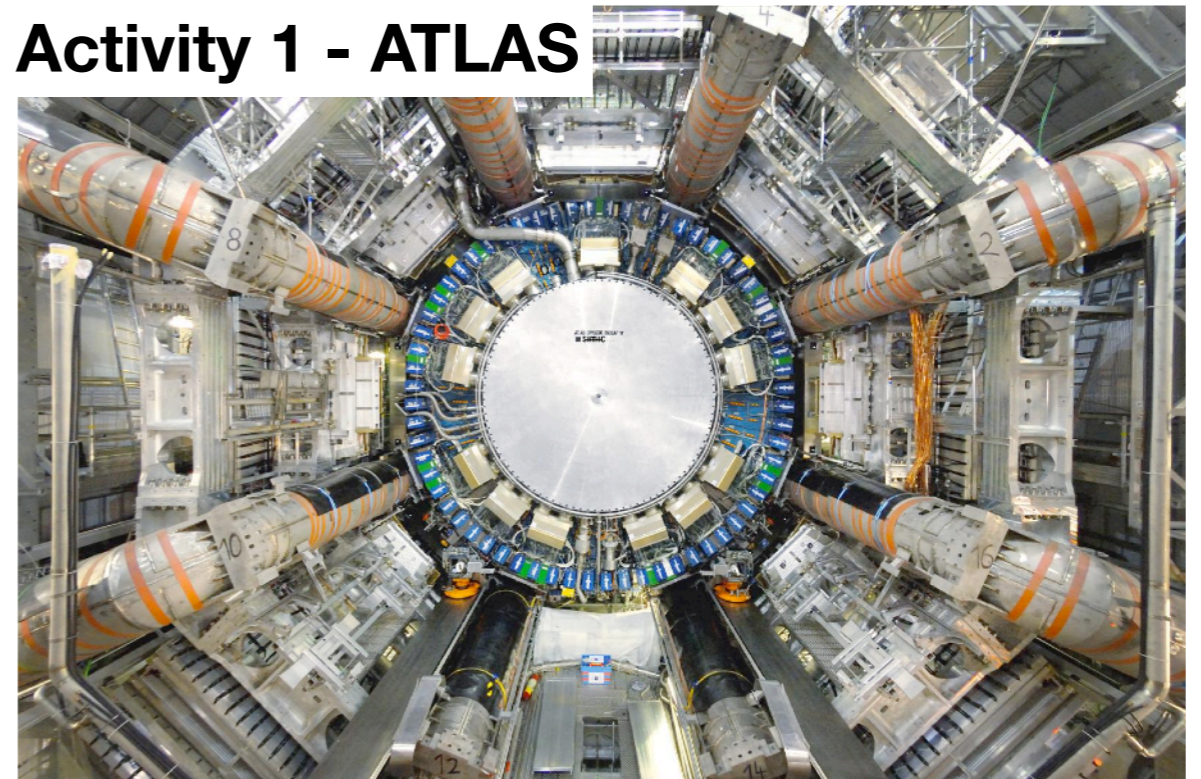
Activity 5 - CMS



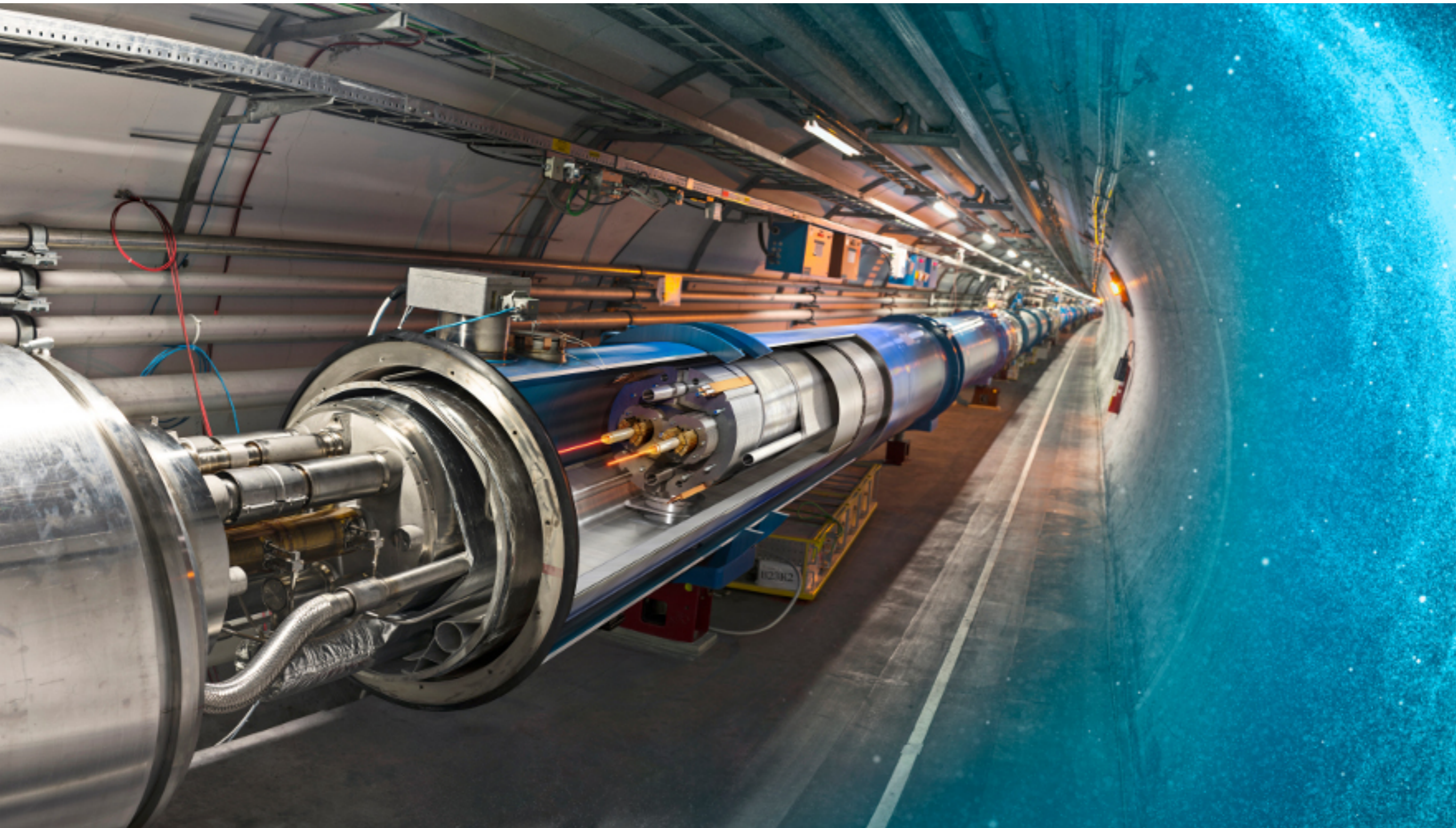
Activity 2 - ALICE



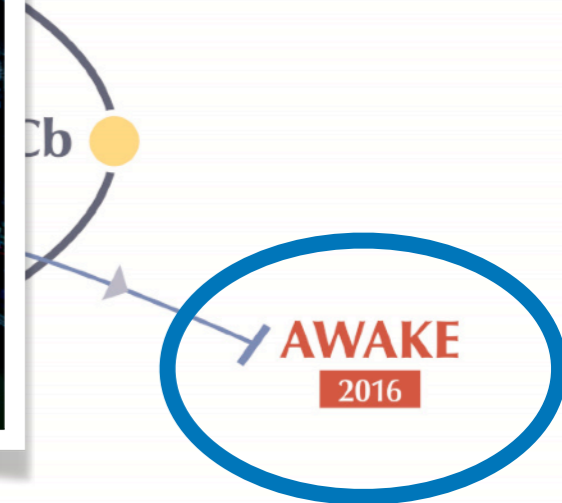
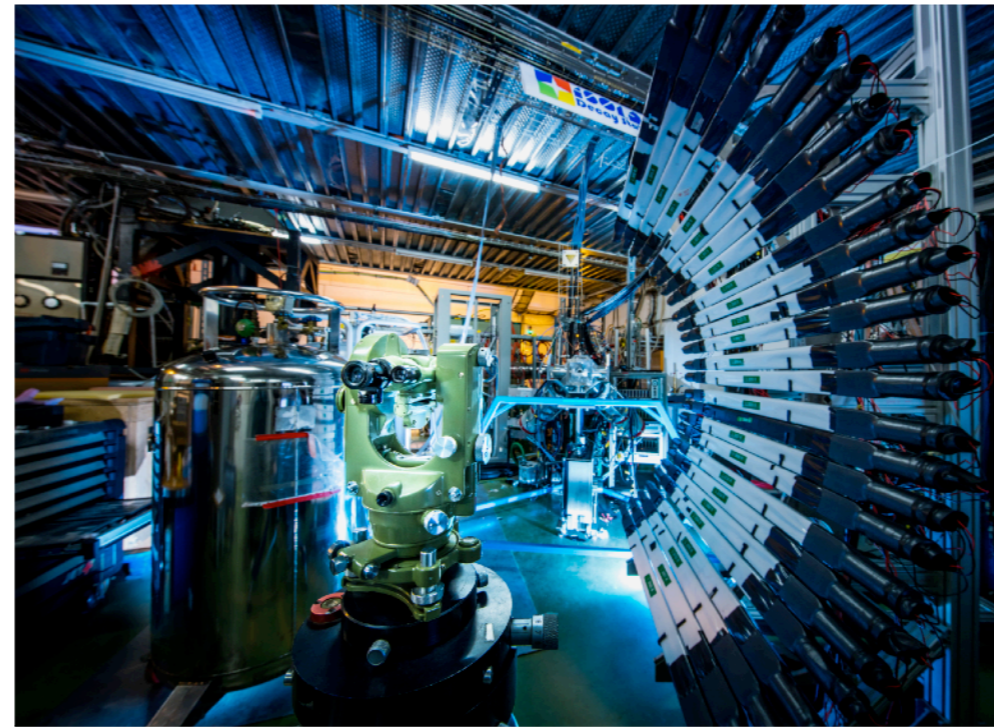
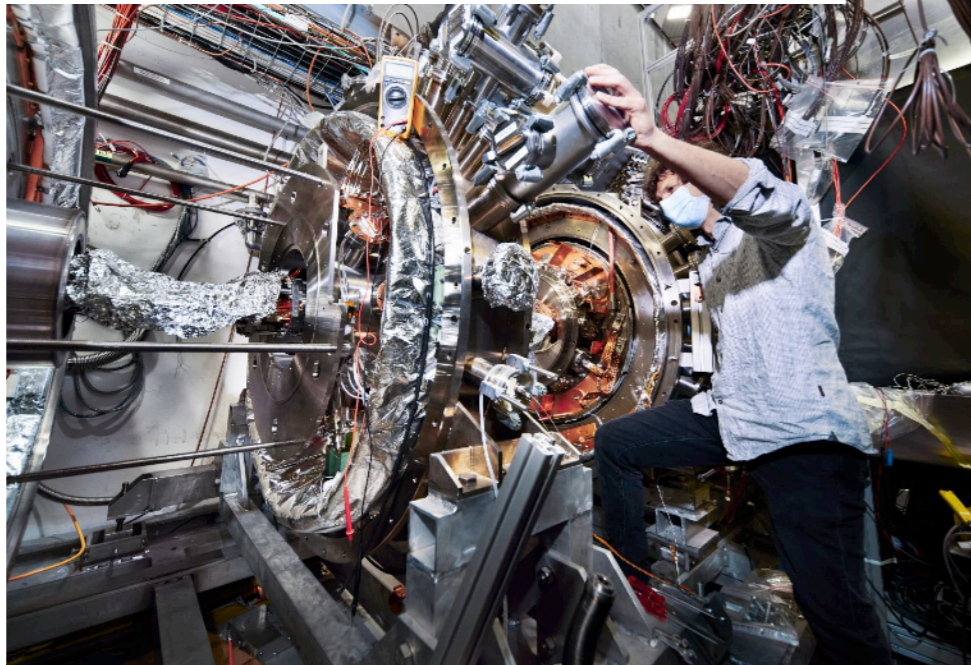
Activity 1 - ATLAS



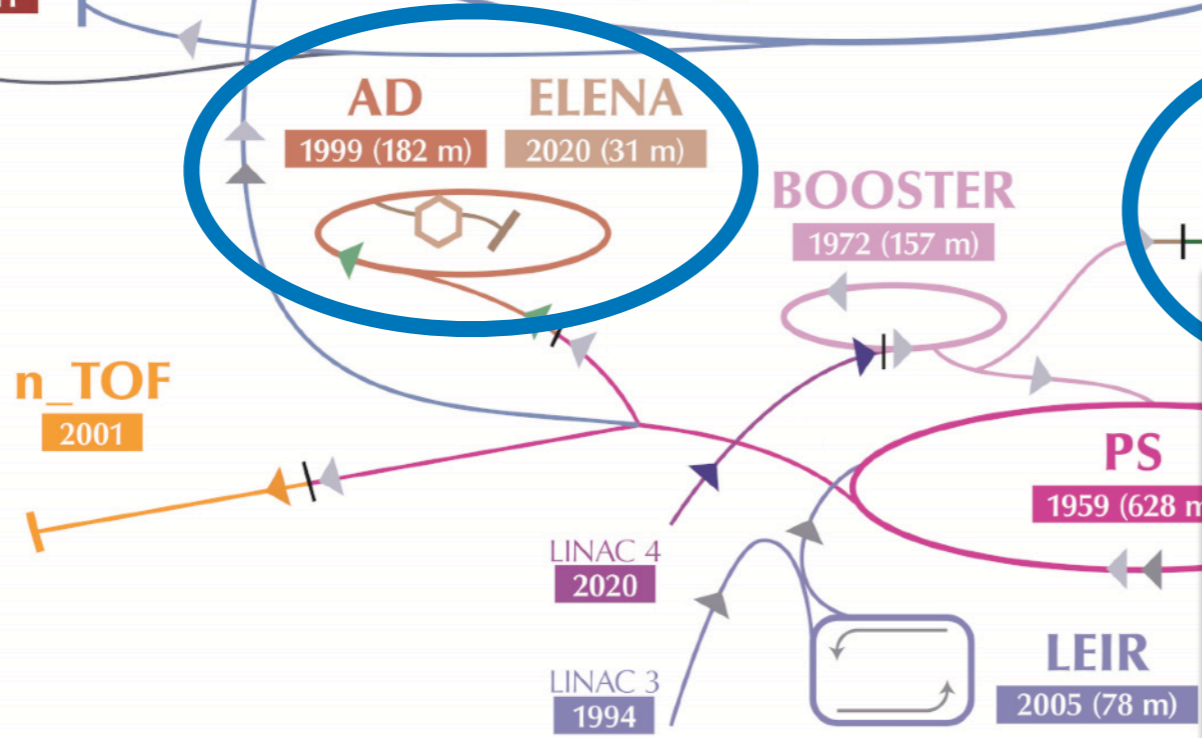
Large Hadron Collider



Activity 4 - ISOLDE, AEGIS



2011



Activity 3 - CLIC, AWAKE



Physics Research

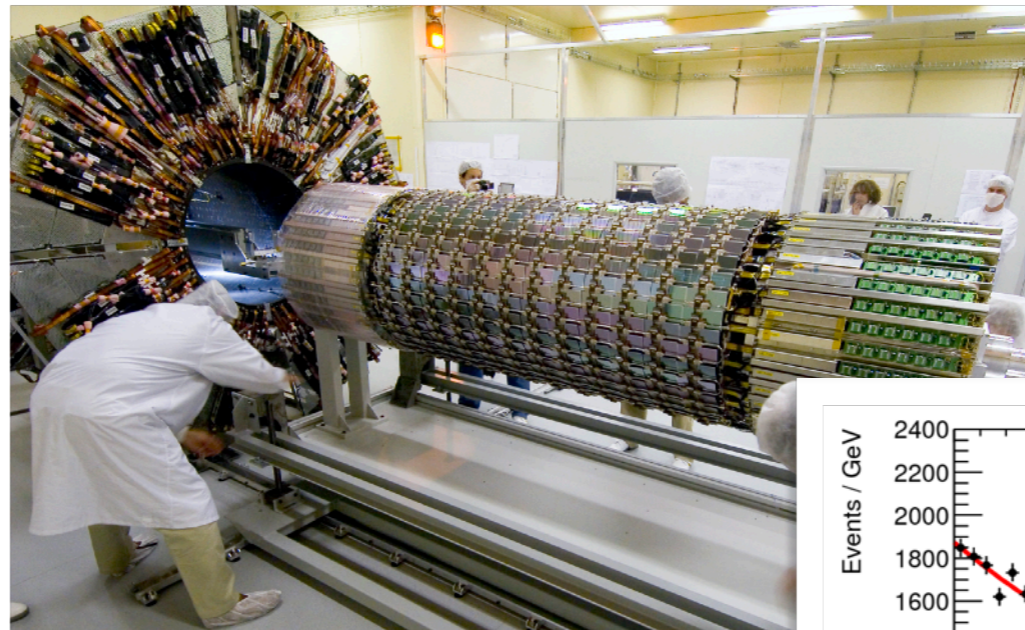


OTP, Service work

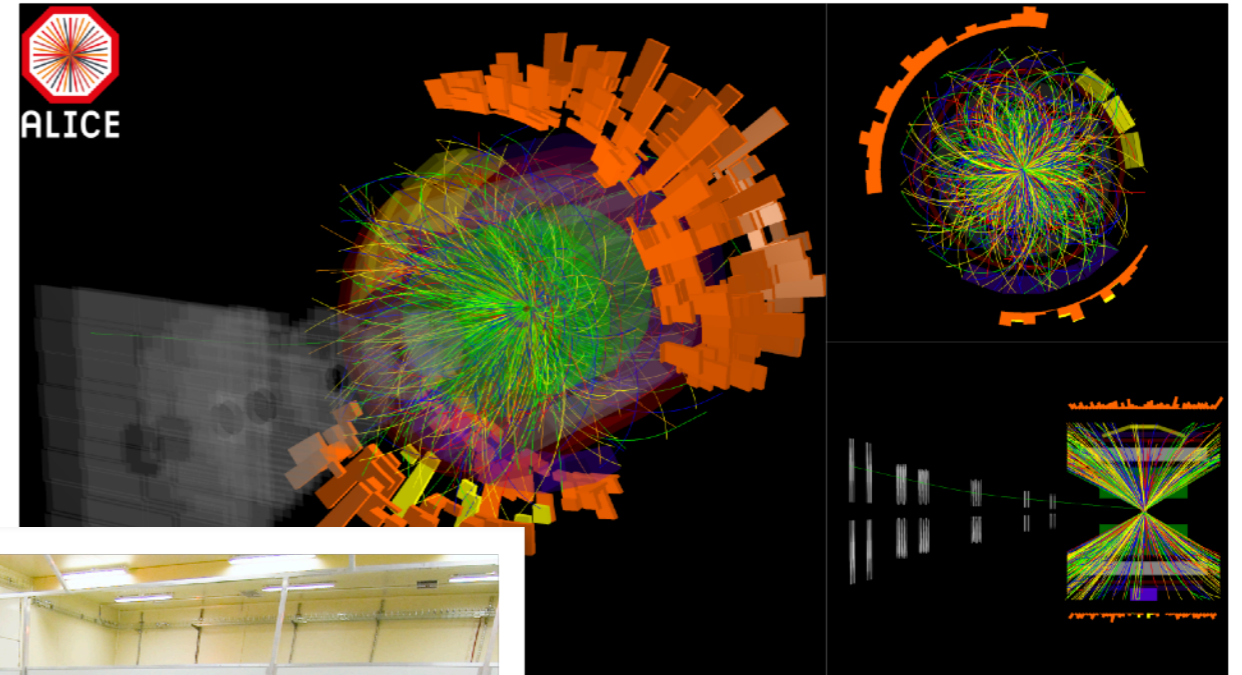
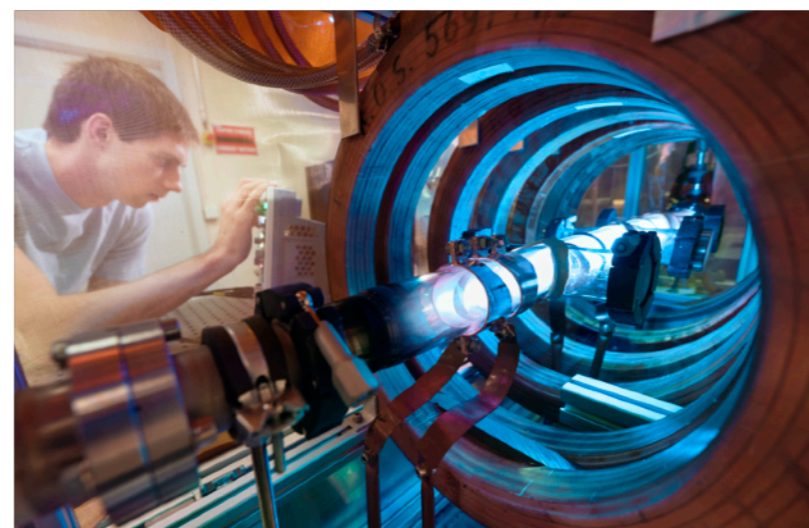


Computing R&D

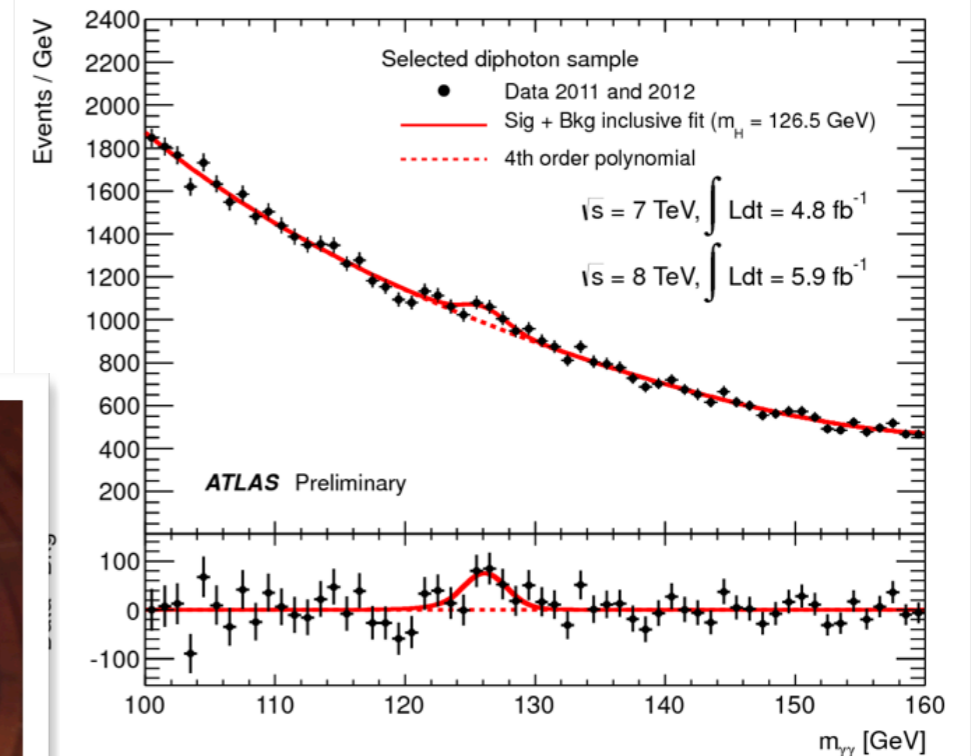
Detector R&D



Accelerator R&D



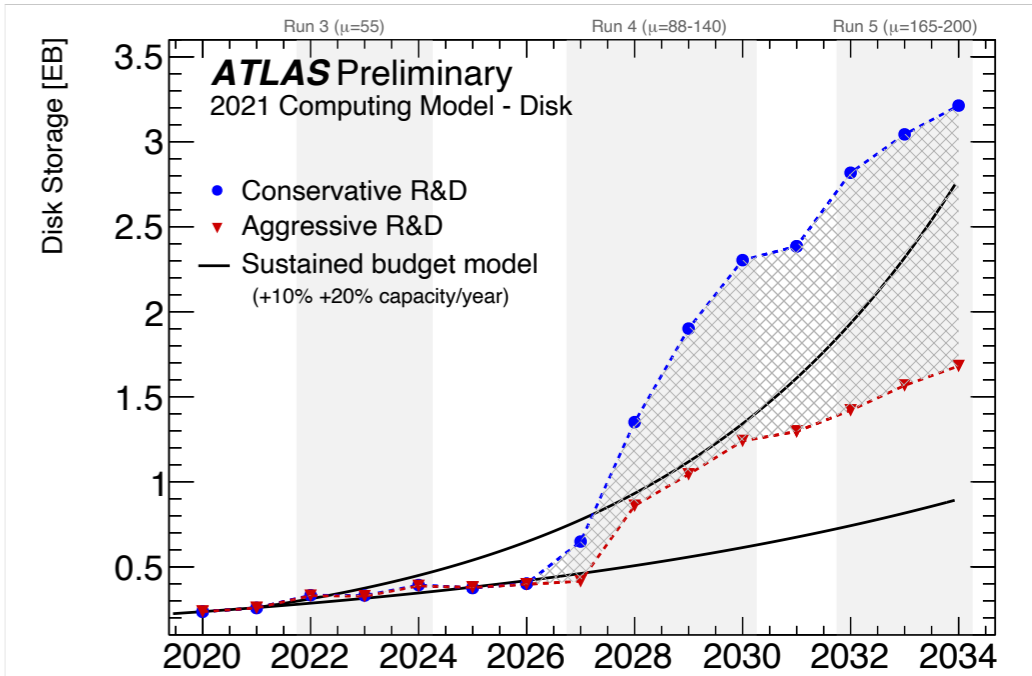
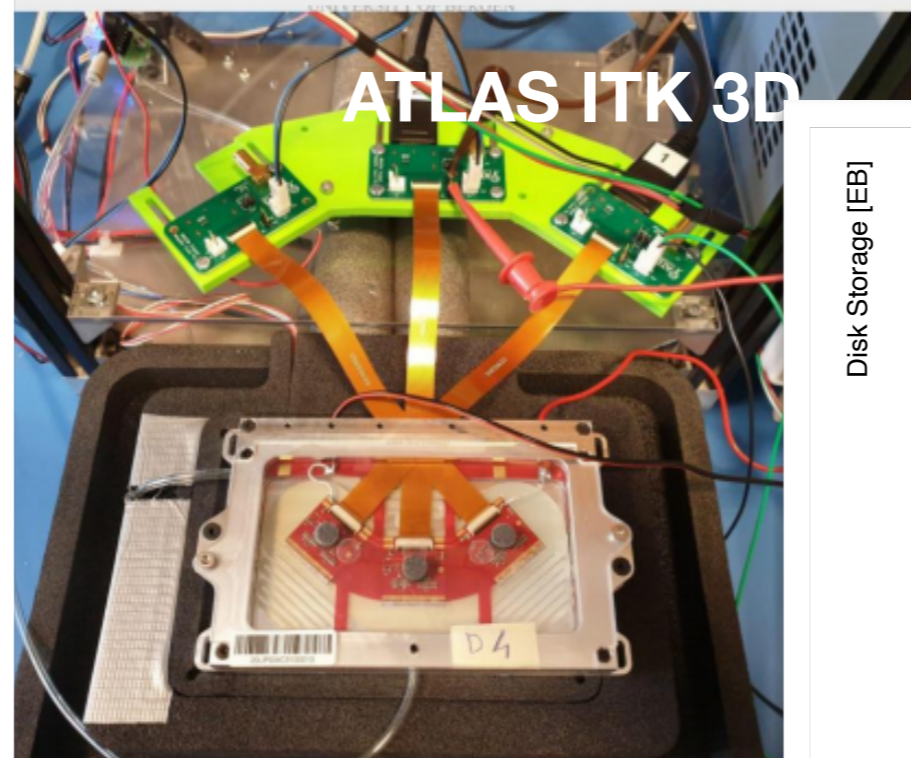
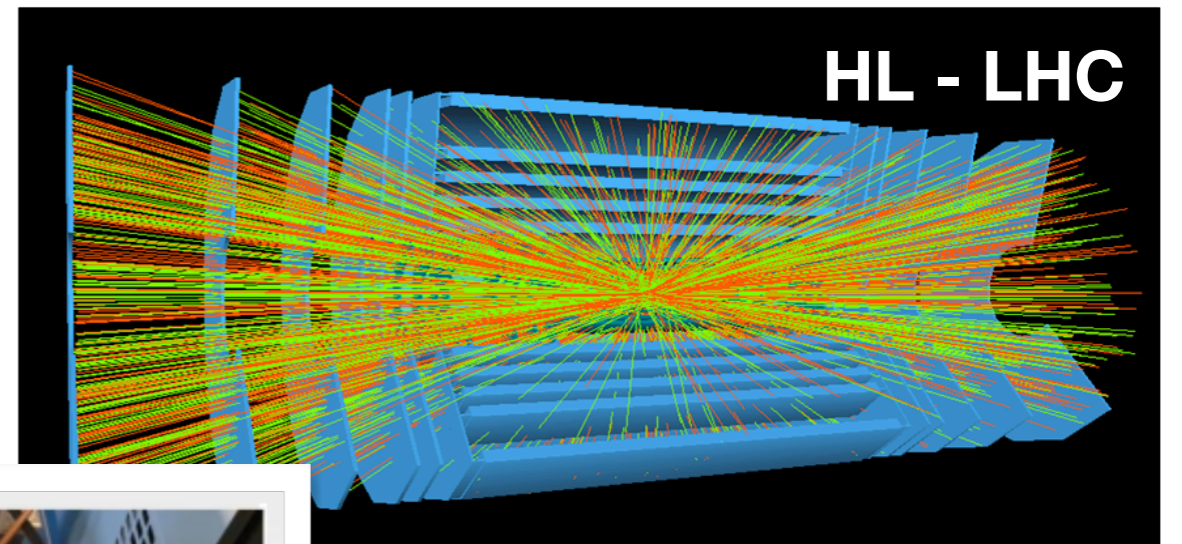
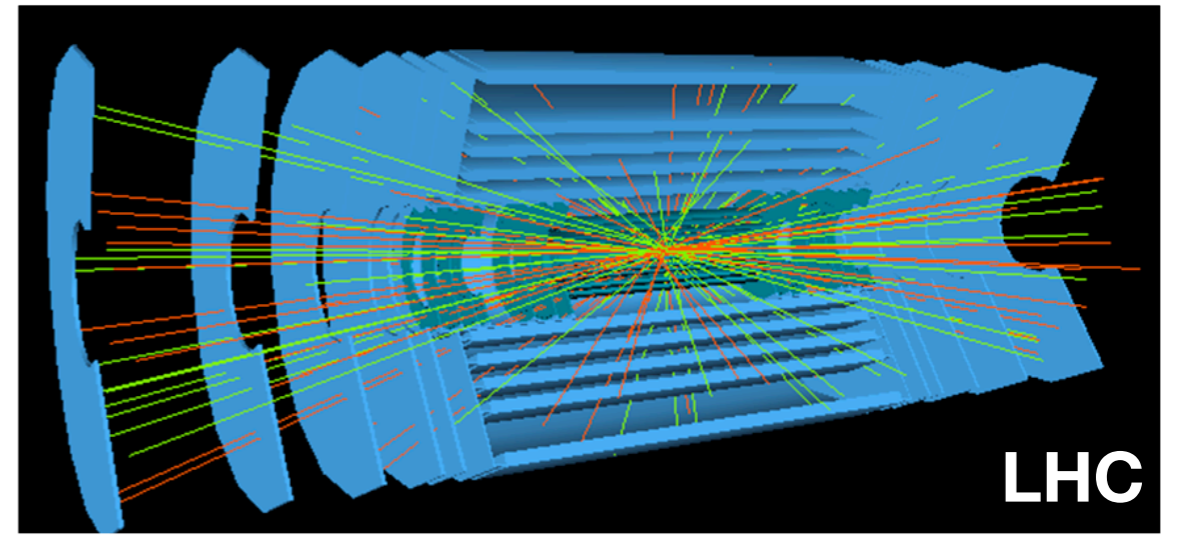
Operation of the experiments



Data Analysis

Upgrade to High Luminosity LHC

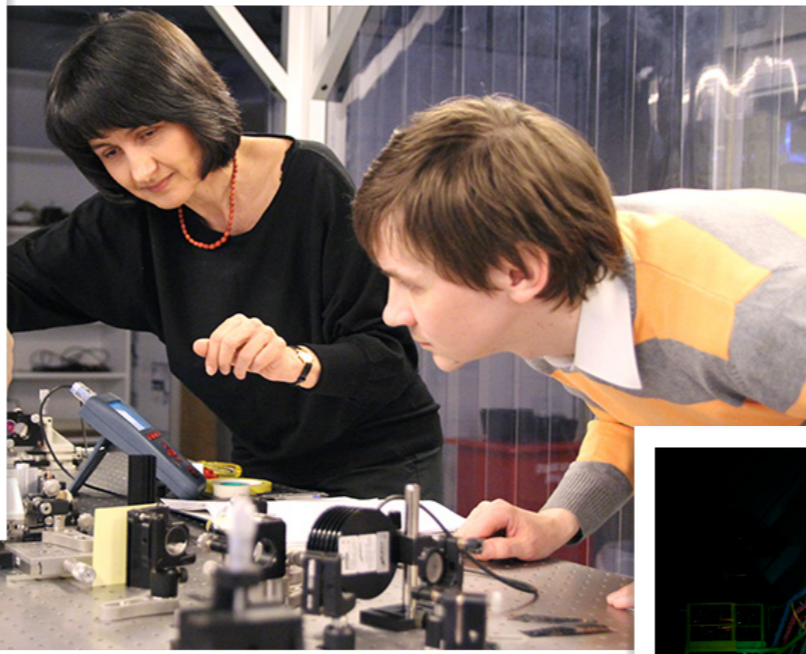
- Collision rate 5 times bigger than LHC
- More statistics needed to find rare phenomena (BSM, dark matter)
- **Norway participates in the upgrades of ATLAS and ALICE**
- Collaborates in Norway with SINTEF (NorFAB), NEIC, (Sigma2/Uninett)
- Part of the ESFRI - roadmap
- Financed by RCN infrastructure (NorLHC og NorLHC-II)



Technology Research



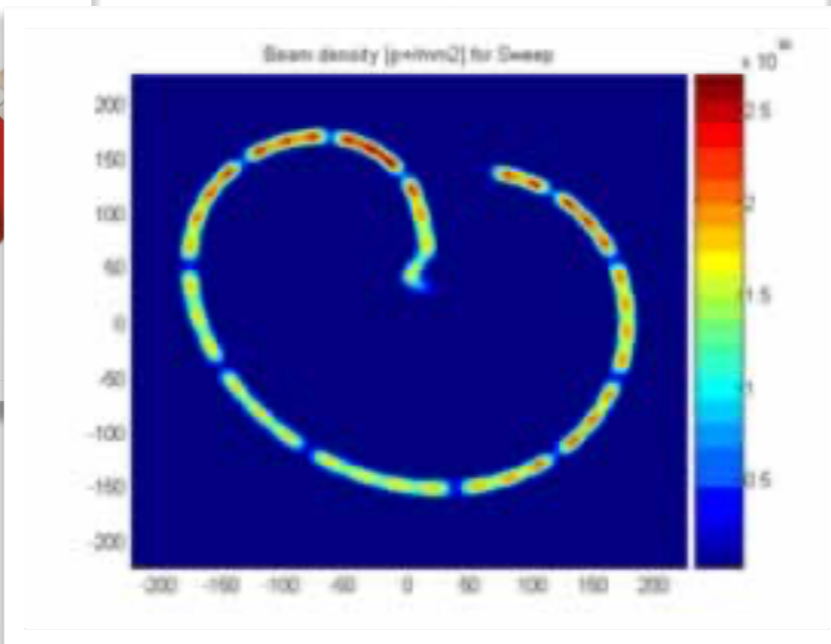
Lasers



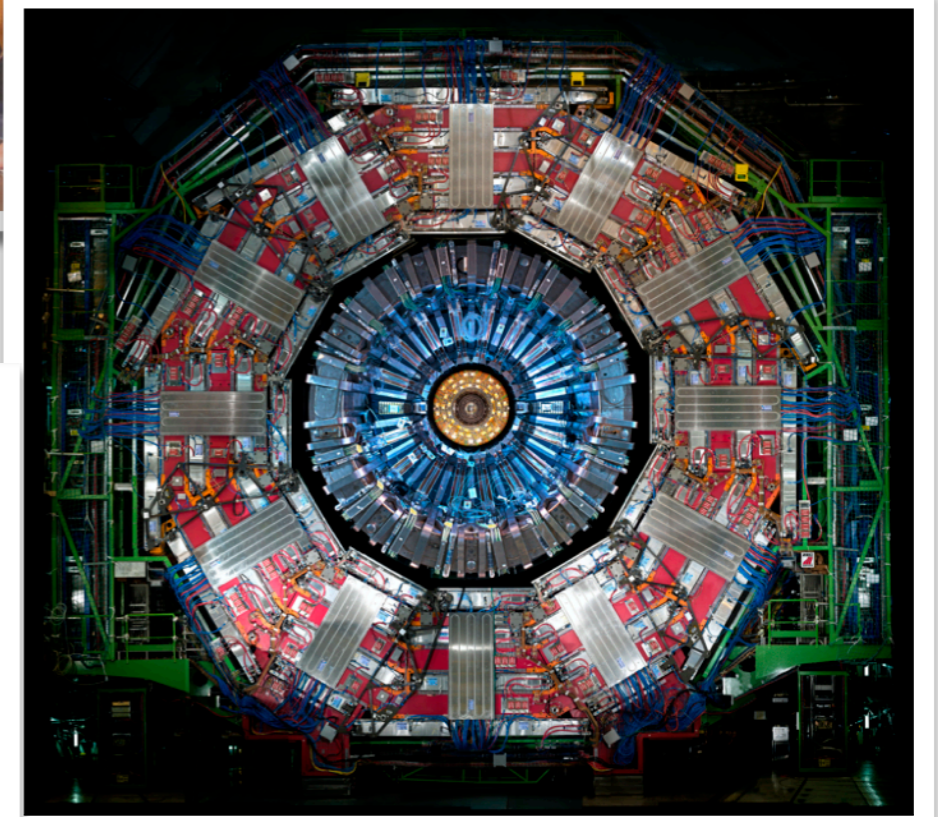
Material Science



Robotics

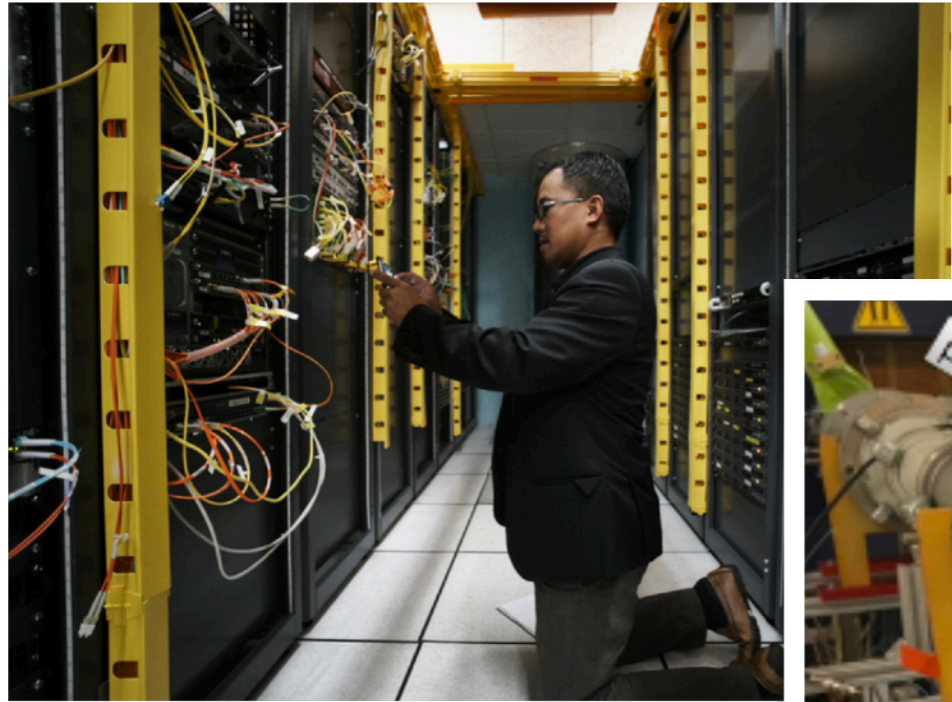


Entrepreneurship



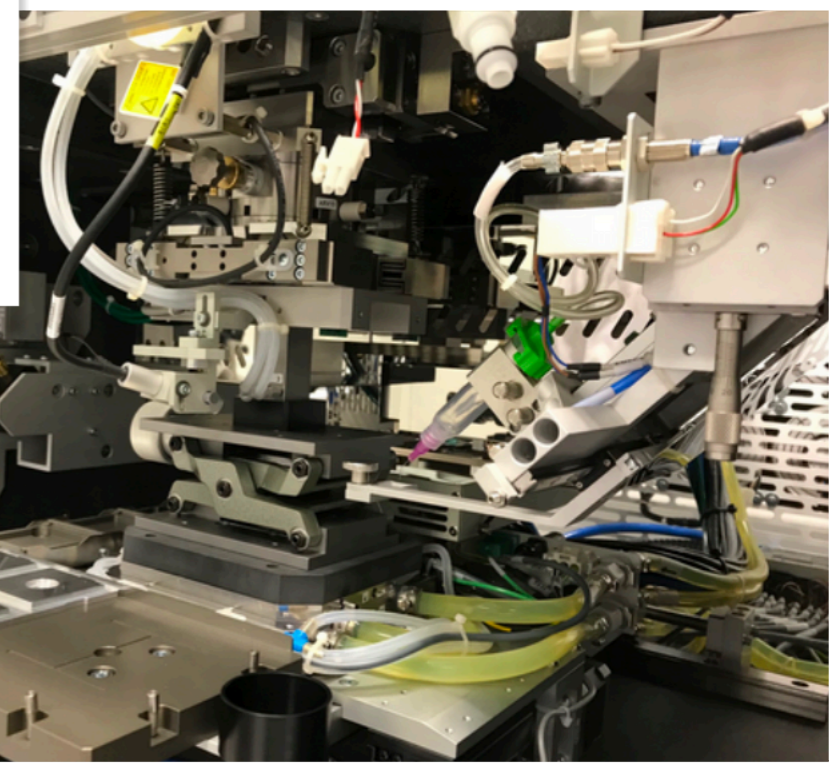
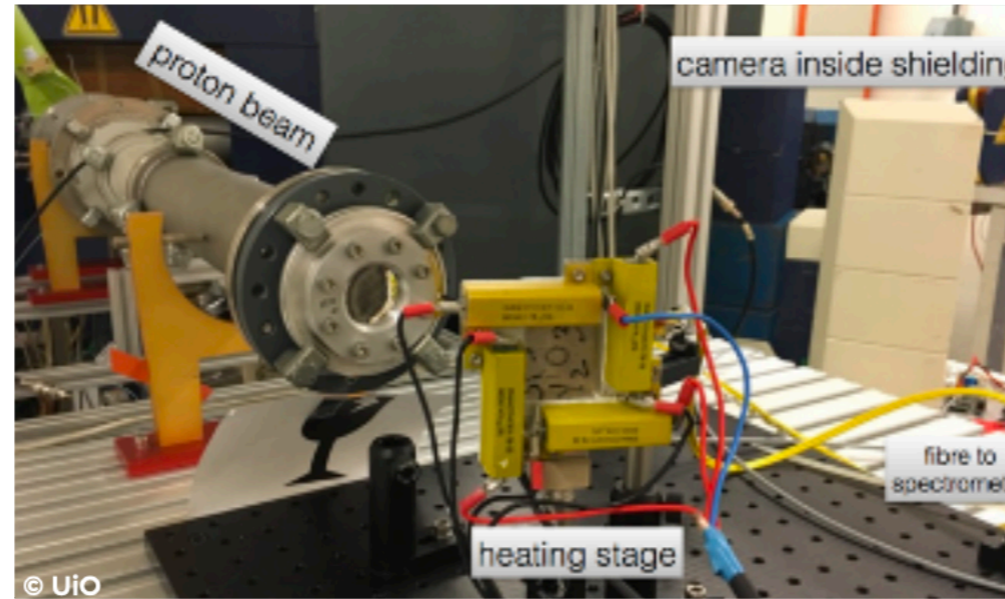
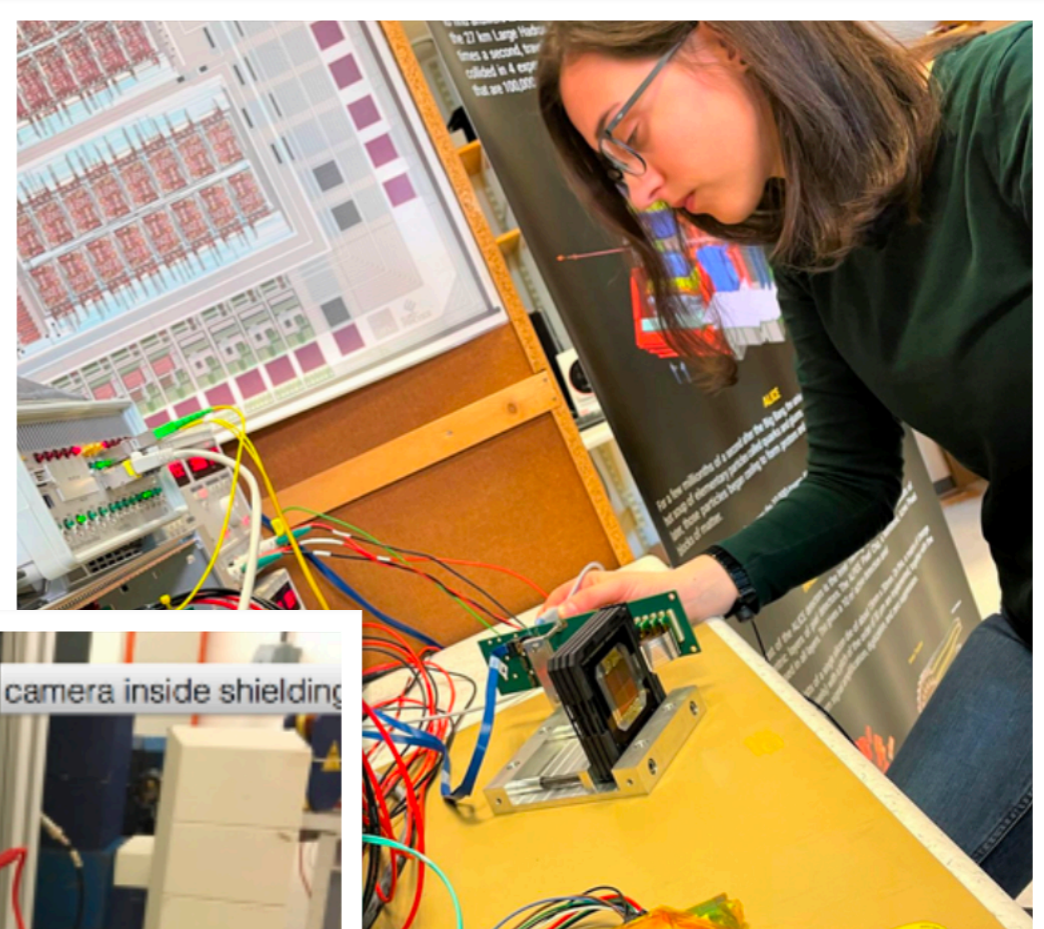
UiA and CMS

Laboratoires and computing facilities



WLCG Tier-1

Oslo
Cyclotron
Laboratory

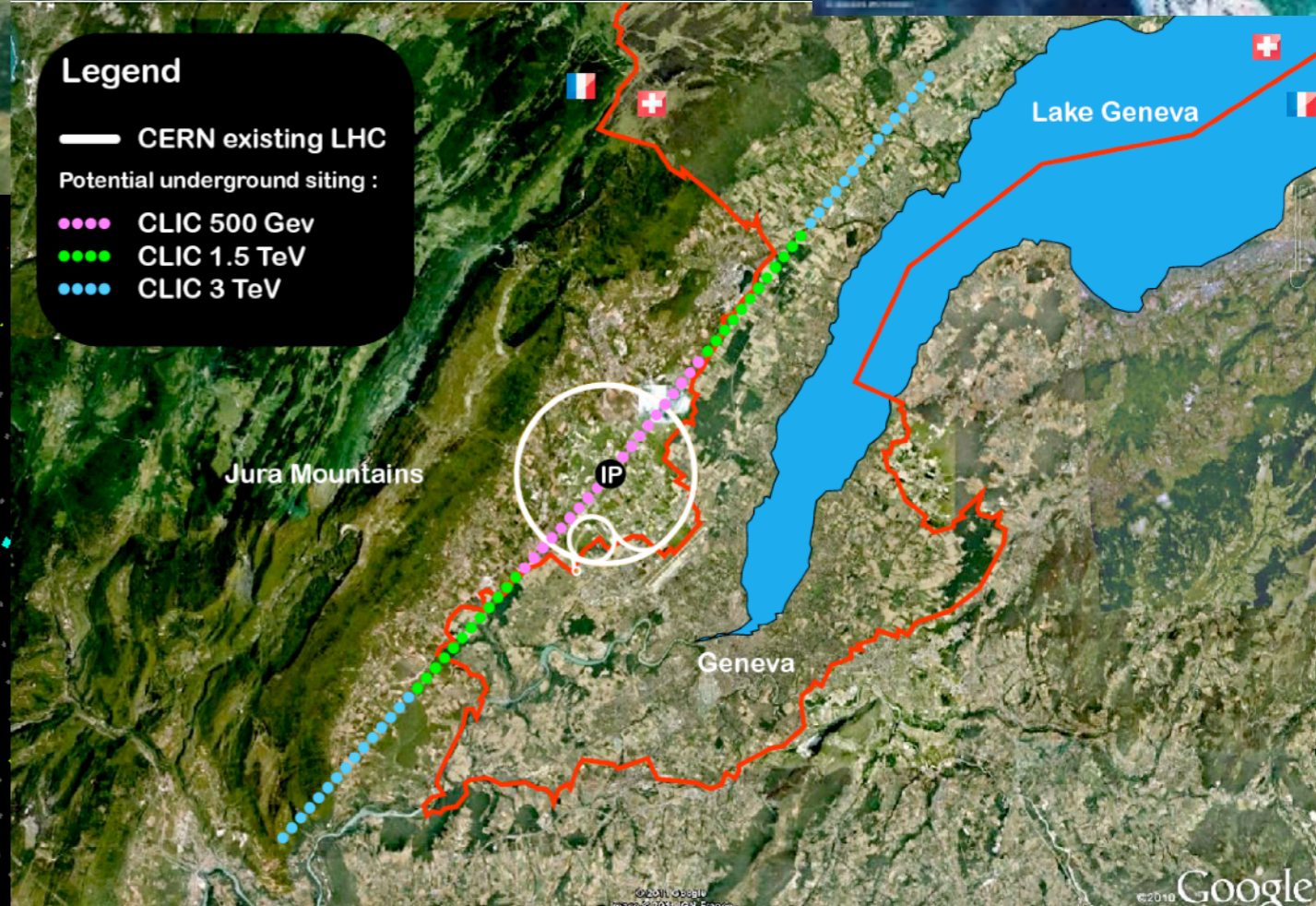
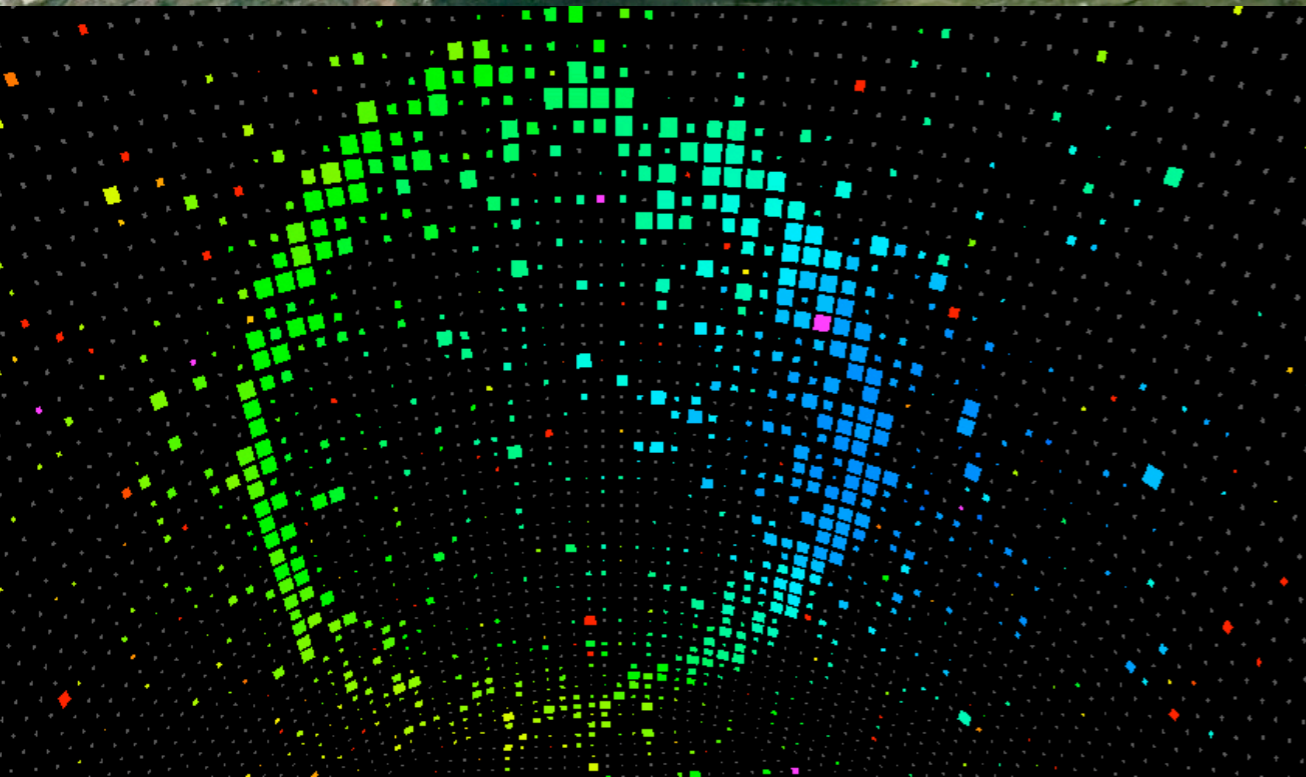
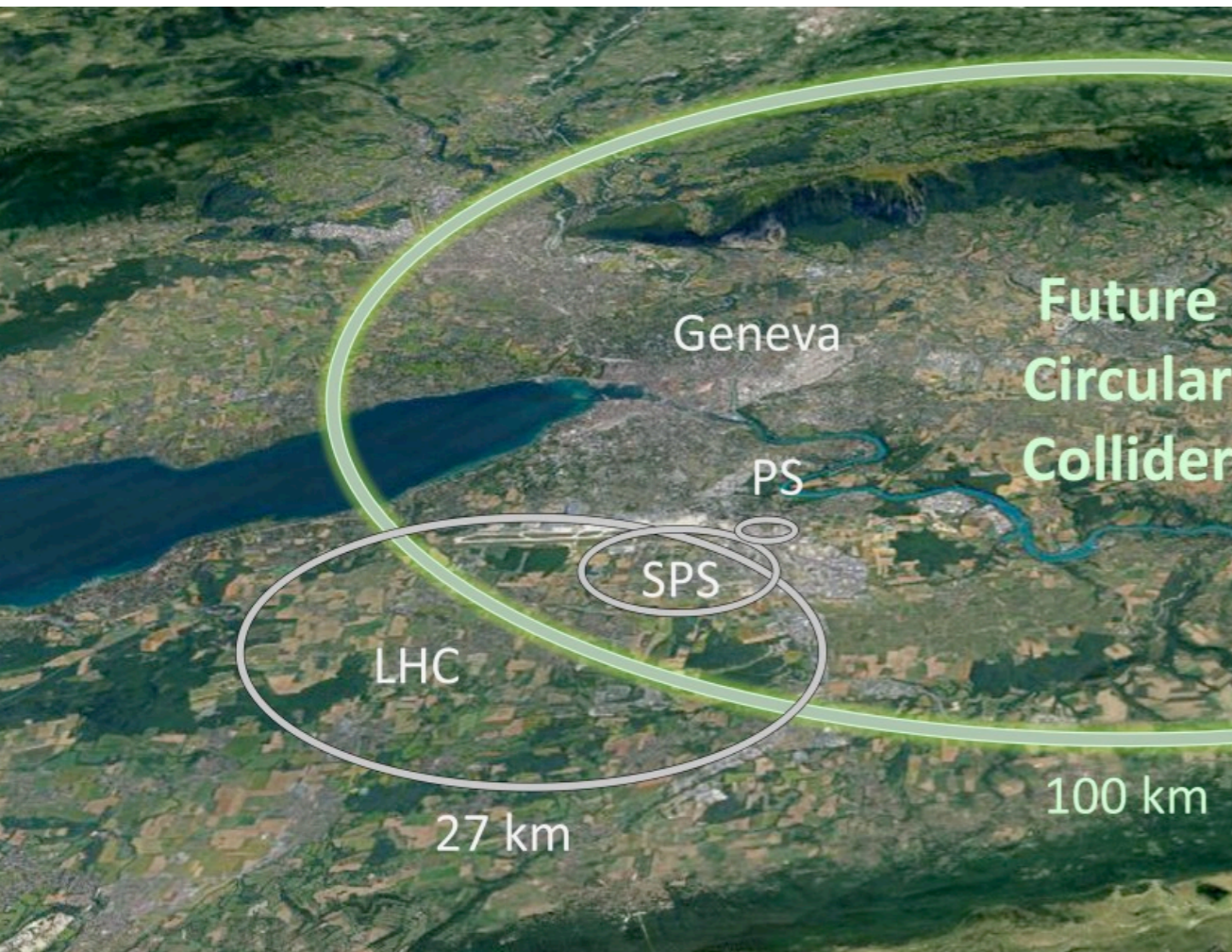


NorFab USN

++

Laboratory of electronics and instrumentation UiO

Future of Norway@CERN

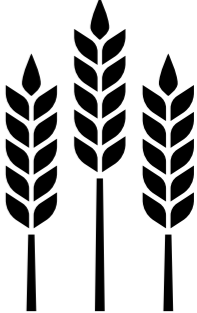


The NorCC year

Biannual Conference
Spåtind - 2023



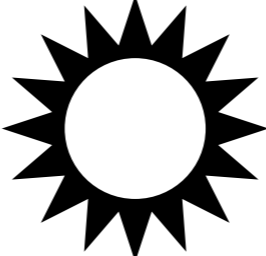
Annual report GB
Economic report NFR



Seminars
activity events

1.October
RCN report

Yearly
workshop
14-15. September
in 2022



Summer@CERN
27.6 - 8.7.2022

Seminars
activity events



A6 - Education, Dissemination and Exploitation

◆ NorCCs students program

- ◆ **Common courses** for NorCC students - posted on web-page: <https://norway.cern/open-courses-norwegian-universities>
- ◆ **Seminar series** (students + general), Tuesdays at 12:00
- ◆ **Summer @ CERN** - 2 weeks event at CERN, 2022 between 25-30 participants.
- ◆ **NTNU screening week** - Since 2008 NTNU has been sending their students NTNU School of Entrepreneurship to CERN, 1 week, total 300 students so far and 52 technologies screened.
- ◆ **Norwegian teachers program** - will be arranged 2022/2023, typically 20 Norwegian teachers, one week at CERN, lectures and activities presented by Norwegian scientists
- ◆ **Norwegian visits to CERN** - Over 1000 visiting high school students from Norway every year
- ➔ ***On our todo list: Mentor system for students***

Call for guides !

[https://
indico.cern.ch/event/
1164217/](https://indico.cern.ch/event/1164217/)



A6 - Education, Dissemination and Exploitation

◆ NorCC and CERNs students programs

◆ Summer students program

- Quota is 3 students
- From 2023 NorCC will finance additional 2

◆ Technical student program

- *6-8 Norwegian students yearly, some co-financed by NorCC.*
- *Typically from NTNU, Agder, Narvik, HVL and Stavanger.*
- *10 new in 2021.*

◆ CERN PhDs

- *2-3 students from open applications, either by Norwegians applying to CERN or international students doing work for Norway*
- Special program with NTNU, 8 PhD students co-financed with CERN started 2021/2022

◆ Fellow

- Open applications to the fellowship program
- Previously typically 1+2 in the technology transfer group at CERN

<https://careers.cern/join-us/students>



Are you studying physics, computer science, engineering or mathematics?

Are you taking a bachelor's or master's degree?

Do you want a practical summer at CERN?

With some of the world's greatest experiments?

CERN SUMMER STUDENT

Attend lectures, visit the CERN facility, take part in discussions and workshops with people who are frontiers in their fields.

This will be an experience of a lifetime!

Application deadline
January 31, 2022



Images: CERN

TECHNICAL STUDENT

@CERN

Are you a bachelor or master student within Applied Physics, Engineering or Computing? Do you want to spend 4 to 12 months at CERN during the course of your studies?

Then this is the perfect opportunity for you!

As a technical student you can work at the cutting edge of technology within one of the worlds most famous organisations, CERN. Apply now for a place on the programme to learn and contribute your knowledge in any of the following disciplines: applied physics, electrical or electronics engineering, general or civil engineering, IT, mathematics and robotics, material and surface science or mechanical engineering.

Application Deadline
21st of March



♦ **We would like for the students to have a strong voice in the centre, proposal:**

- About half of the persons in the centre are students !
- We have long term projects, long R&D and construction periods of new experiments
- Ensure good communication within the centre, but especially with the students
- Get feedback to the steering committee if what we do works as it should
- Take advantage of excellent ideas from the students !

♦ **Proposal:**

- Student Council - all students are welcome participate
- 1-2 selected students leads the student council and represents the students when needed
- Or alternatively 1 student per university/institution
- 1-2 meetings per year, for instance around our workshop and in the winter

♦ **Strategy for Norwegian CERN-related research 2022/2023**

- We have started work on a longer term strategy plan 10 year - student involvement needed
- Clear goals for the centre
- Beyond LHC - way forward

Thank you !