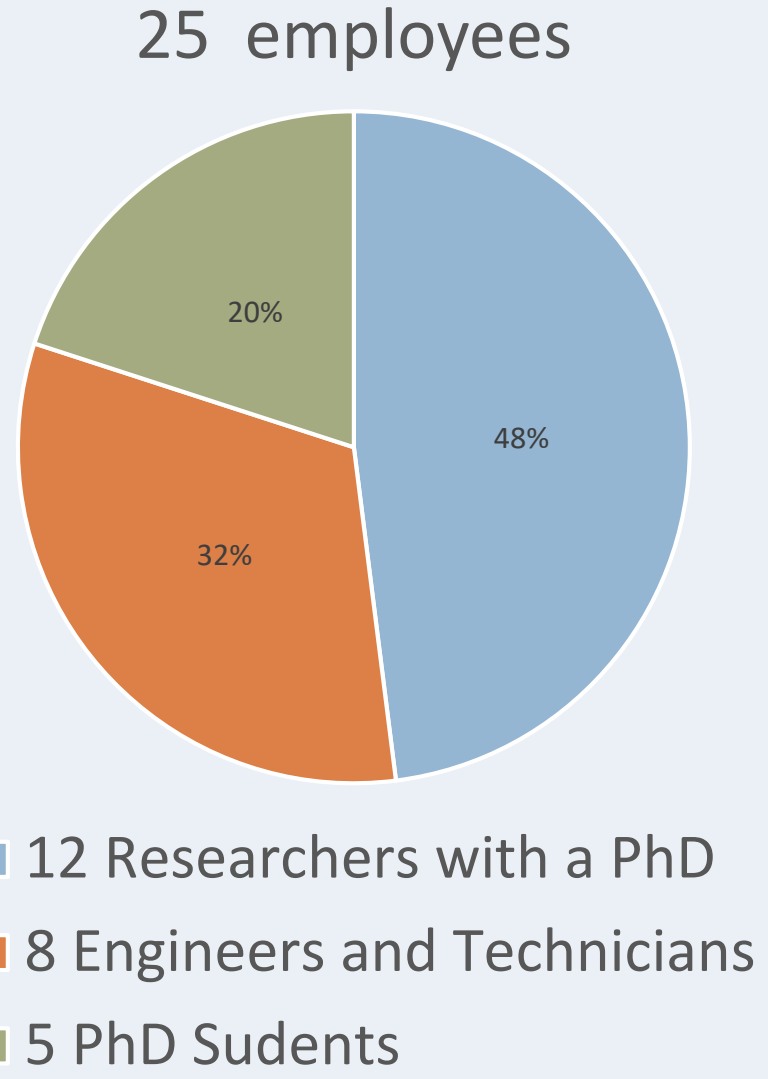
FREIA Laboratory
for Accelerator and Instrumentation Development at Uppsala University

Brief presentation of the FREIA Laboratory at the UU-CERN-RFR meeting for the DFH collaboration project for HL-LHC
Wednesday 20 June 2018

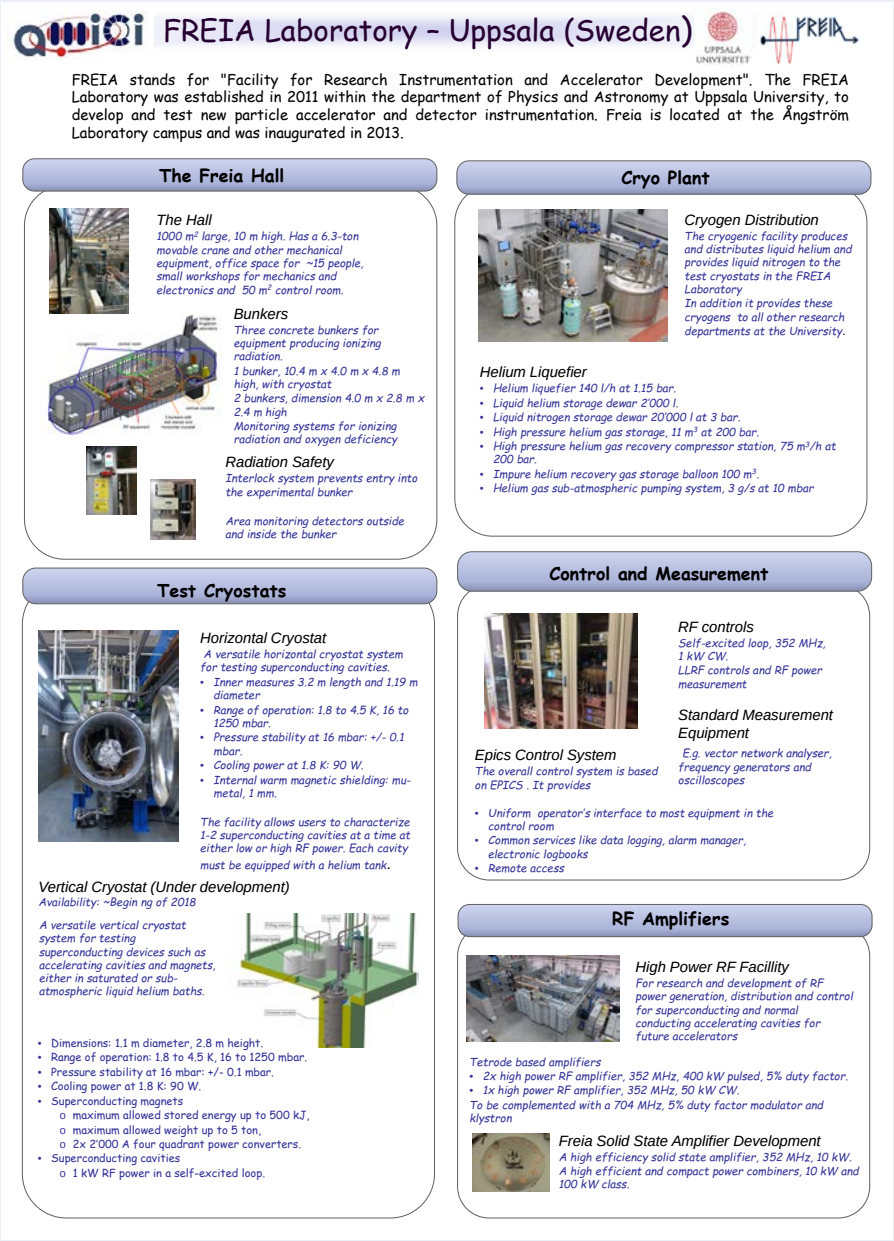
Personnel

- 8 **senior** staff have been recruited **from the former National Uppsala Accelerator Laboratory TSL**.
- New recruitments of mostly **younger** members of the personnel have been made through **wide international announcements**.
- Two out of the currently three recruitments made from outside Sweden (from China, Spain and Ukraine) are **women**.



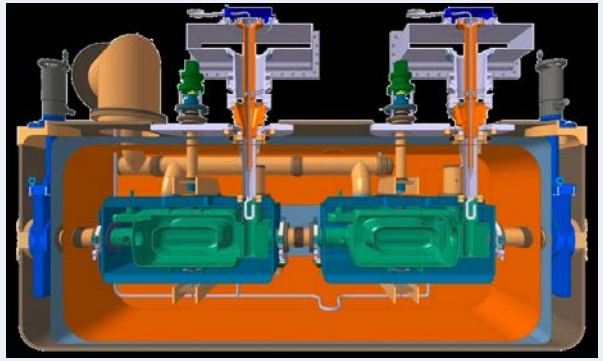
Infrastructure

- Major high-tech infrastructure for **accelerator and instrumentation** development and tests.
- The nearby **Ångström Mechnical Workshop** with its highly qualified workshop personnel and large set-up of modern numerical workshop machines is a significant asset for FREIA.
- The FREIA laboratory will have to **continuously develop and complement its infrastructure** when collaborations on new projects will be added to the current activities.
- **Funding** will be needed in future not only to cover the **operational costs** but also for **investments in new infrastructure**.

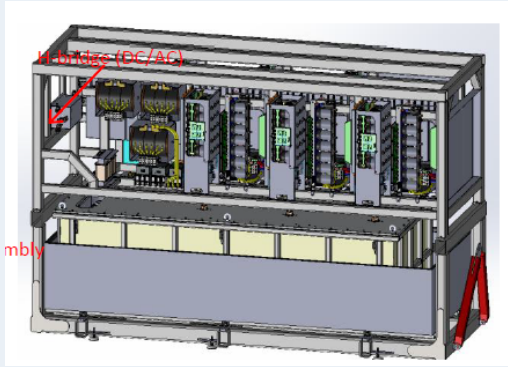


Research profiles

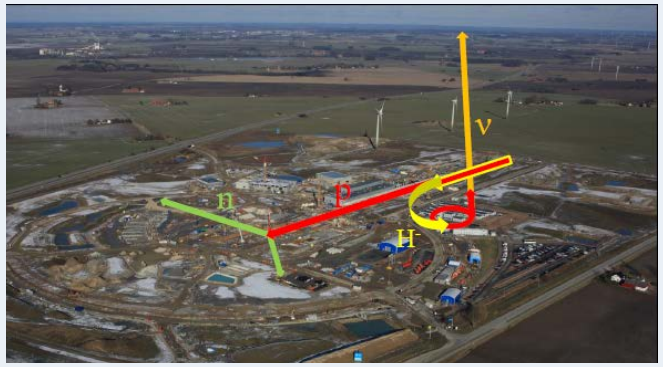
Characterization of superconducting cavities for the ESS Linear Accelerator



Test and development of Crab cavities for the CERN LHC Luminosity Upgrade

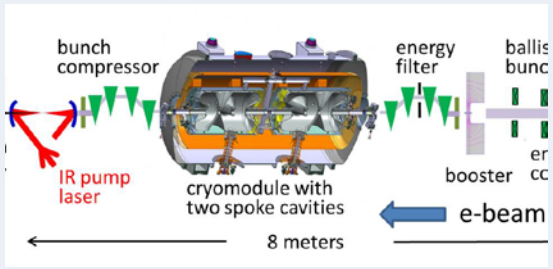


Development of Control system for ESS modulators

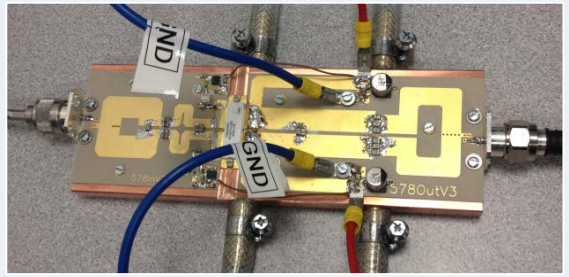


Doubling of the linac power and compression of the proton pulse for the ESS Neutrino Super-Beam (ESSnuSB) project

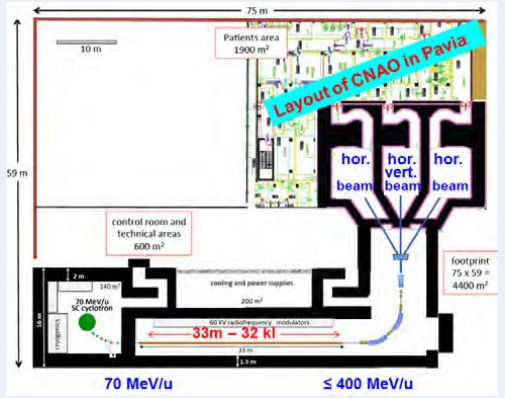
Commission the Laser Heater for X-FEL



Enabling technology of generation of single-cycle light-beams



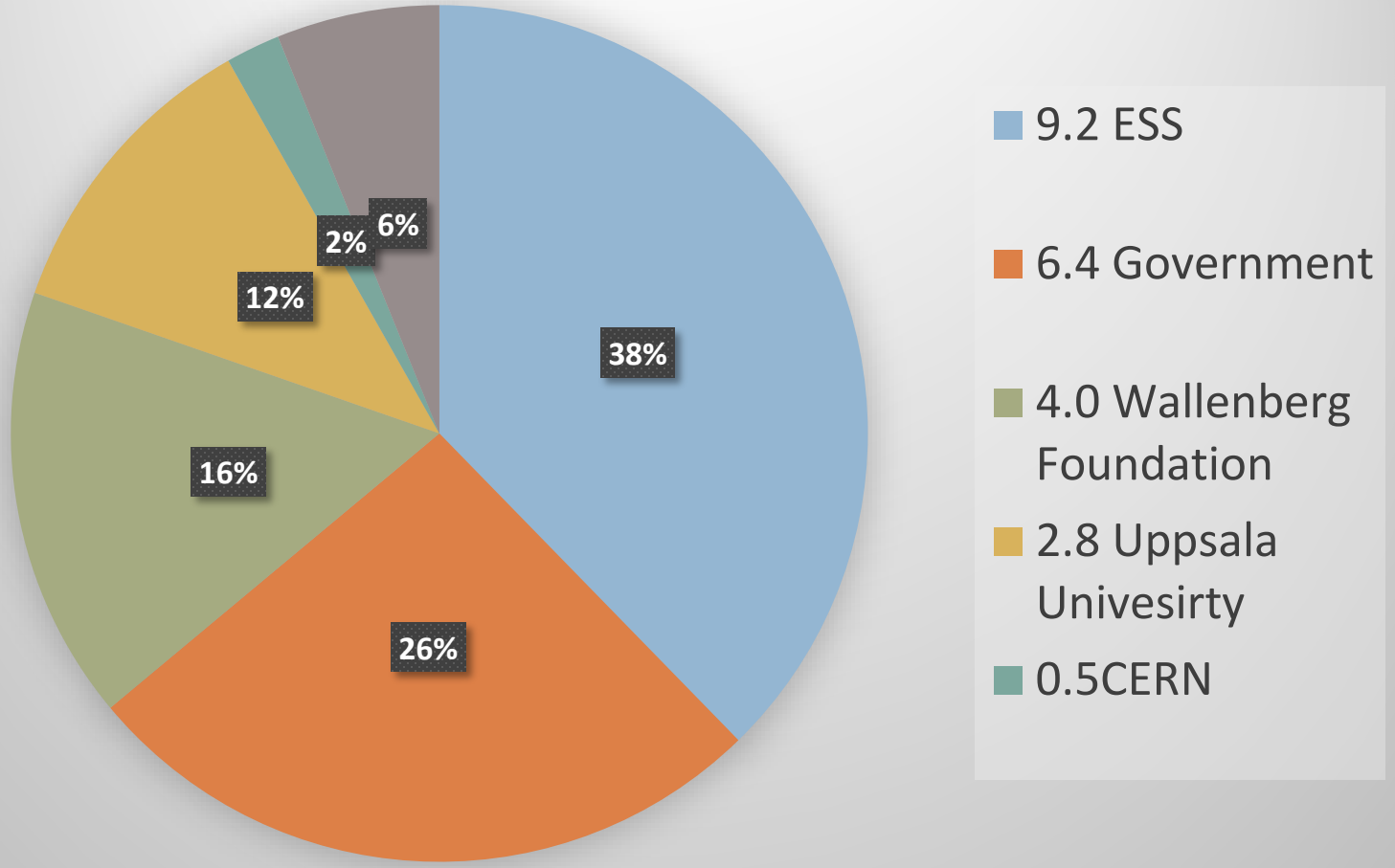
High-power microwave sources for scientific and industrial accelerators



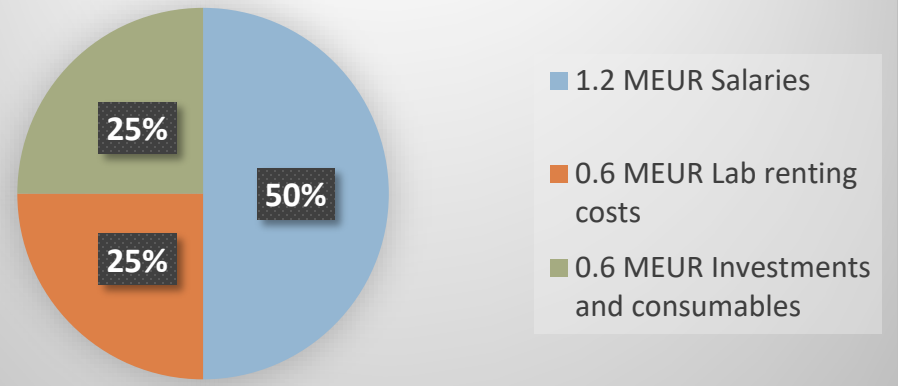
Superconducting Light Ion Haron Therapy Cyclinac

Finances

Contribution to total income 24.4 MEURO, period 2013-2020



Operation cost 2.4 MEUR per year



There are also contributions coming from several EU-projects in which FREIA is a partner:

- EUCARD2 40 kEURO,
- ARIES 337 kEURO,
- EuroNuNet 16 kEURO and
- AMICI 100 kEURO.

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The regular operations budget from the Faculty to FREIA is 0.1 MEUR/year.

Academic culture

- The FREIA research and development results are presented by FREIA scientists at **seminars and international conferences** and published in refereed journals, conference proceedings and internal reports.

- FREIA staff are contributing to the **teaching** to a variety of undergraduate and graduate courses at the University

- FREIA is **inviting external scientists to give seminars** at the Department of Physics and Astronomy (Carlo Rubbia of CERN, Ken Long of Imperial College and John Womersley of ESS are examples of renowned scientists recently invited to give FREIA seminars).

- The FREIA activities regularly reviewed at the **weekly meetings** of the FREIA Division.

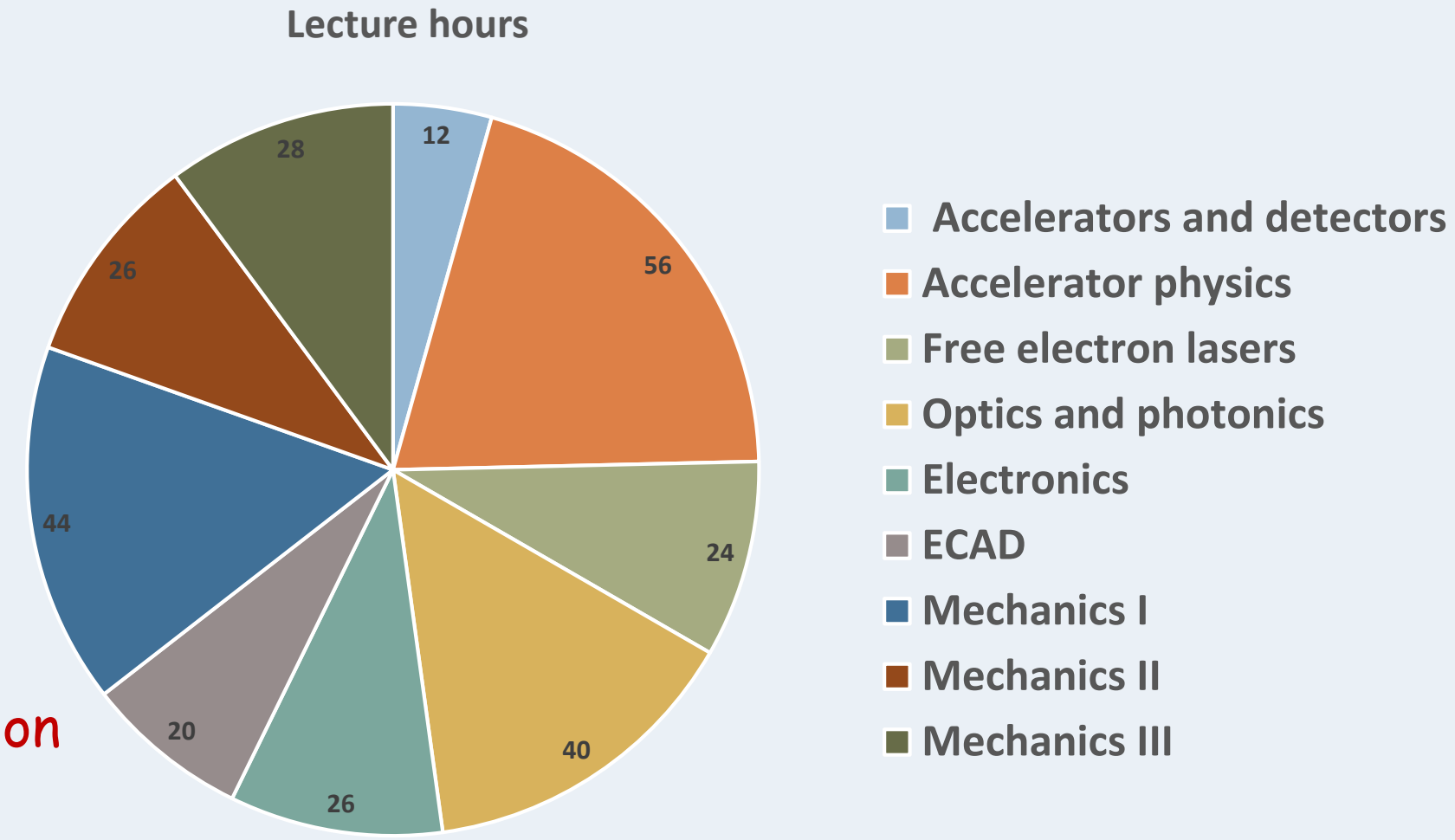
Teaching

8 FREIA lecturers giving

304 lecture hours

and

158 laboratory instruction hours



FREIA Vision

Pursue physics research and development on the national and international level in collaboration with large research infrastructure and industry of accelerators and instrumentation for the development of new research instruments for Neutron Physics, Particle Physics, Synchrotron Radiation Physics, Medical Physics, Nuclear physics, Fusion Physics, Astronomy and Space Physics.