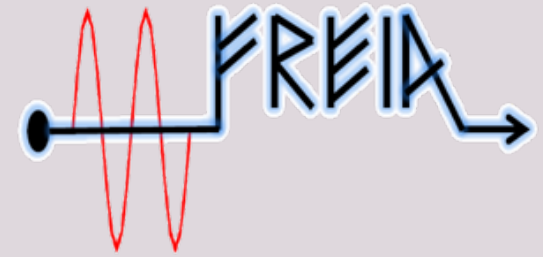




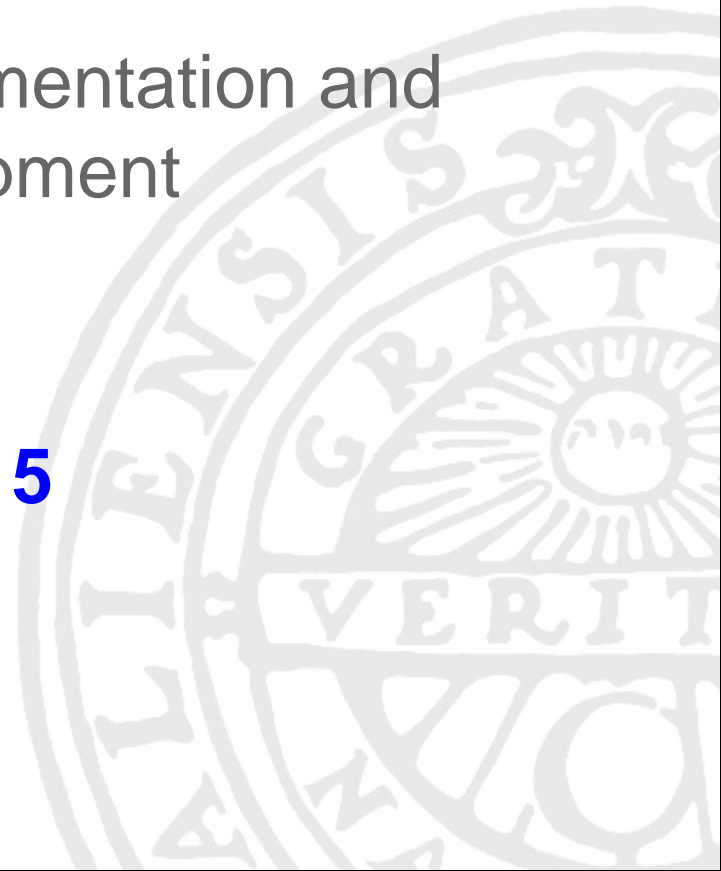
UPPSALA  
UNIVERSITET



## FREIA Laboratory

Facility for Research Instrumentation and  
Accelerator Development

**Visit ABB**  
**2 February 2015**



## Facility for Research Instrumentation and Accelerator Development



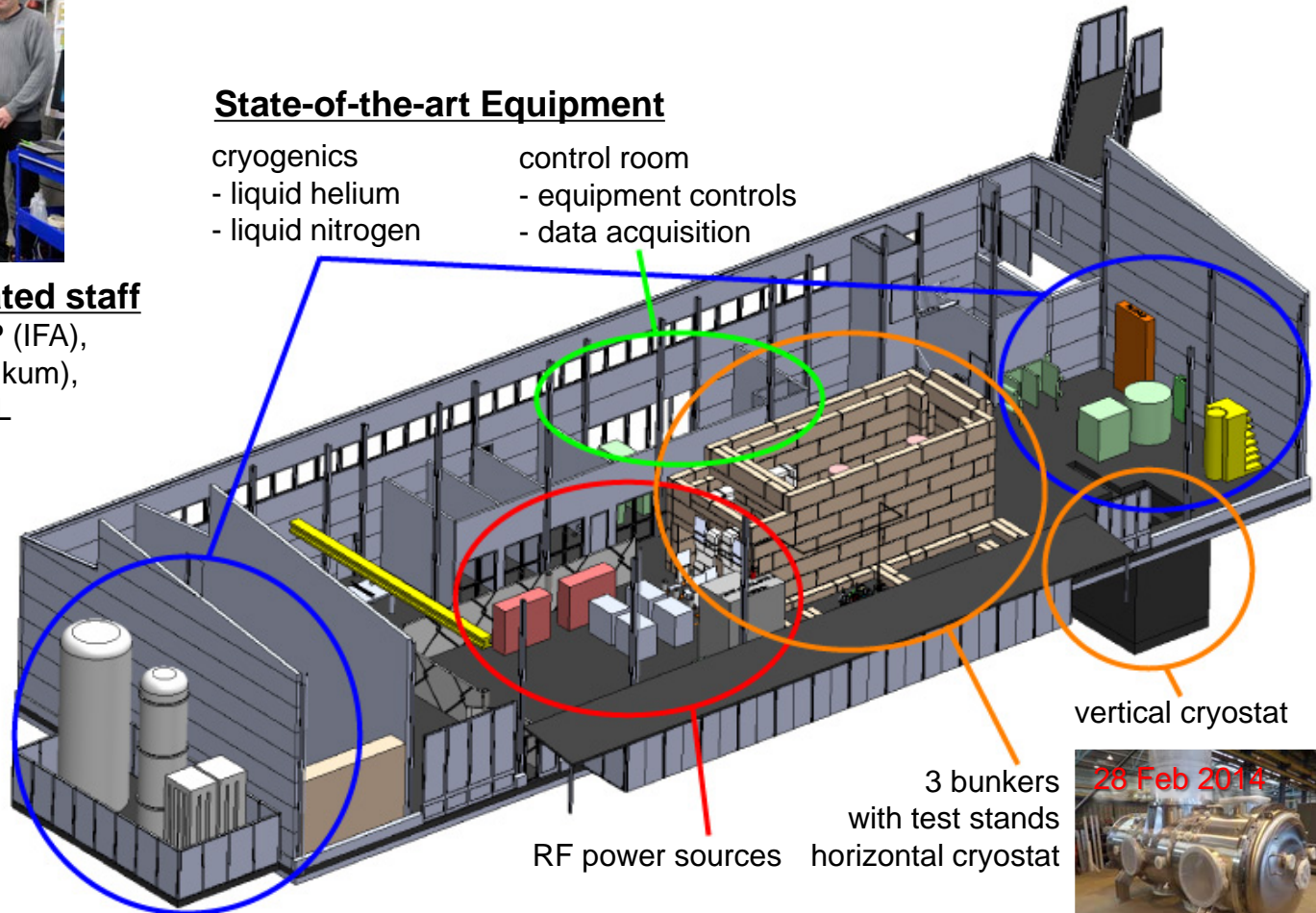
### State-of-the-art Equipment

- cryogenics
  - liquid helium
  - liquid nitrogen
- control room
  - equipment controls
  - data acquisition

### Competent and motivated staff

collaboration with HEP & NP (IFA),  
solid-state electronics (Teknikum),  
Ångström workshop and TSL

Funded by  
KAWS,  
Government,  
Uppsala Univ.



# The New FREIA Laboratory



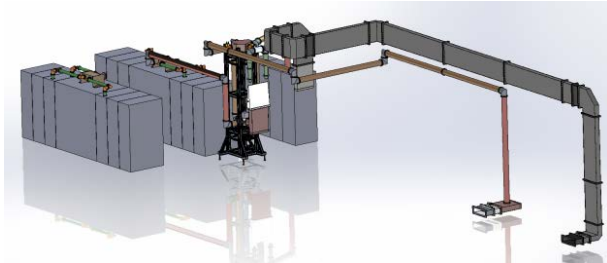
**2K  
9 Dec. 2014**



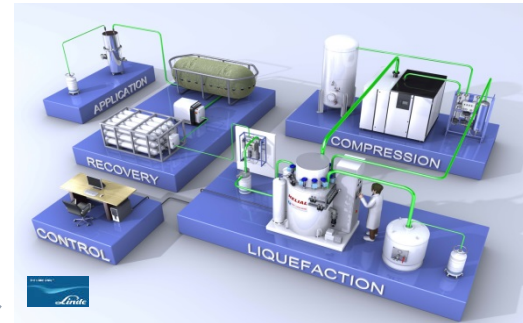
**First Liquid Helium  
14 March 2014**



- Three main subsystems needed



**RF Power Source**

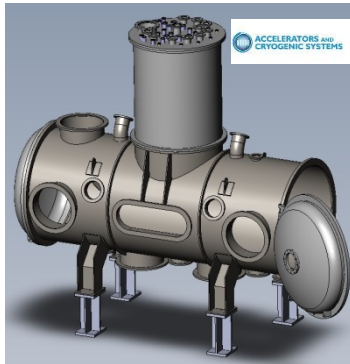


**Cryogenics**

Courtesy of P. Duthil

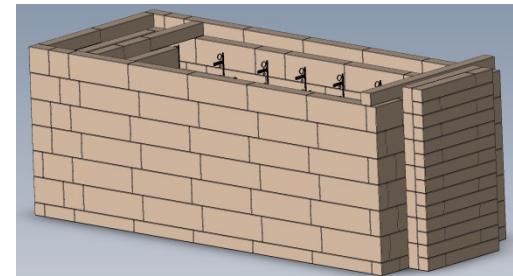


**Spoke Cavity  
(superconducting)**



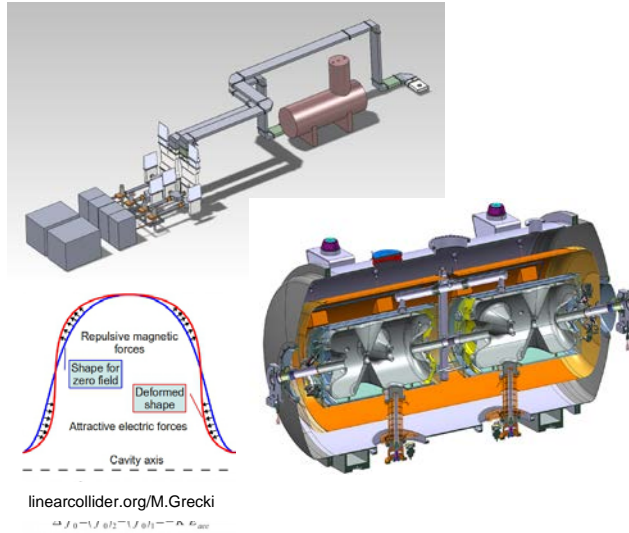
**Cryostat**

To avoid radiation in public areas:



**Bunker**

## SRF Spoke Cavities & Linac



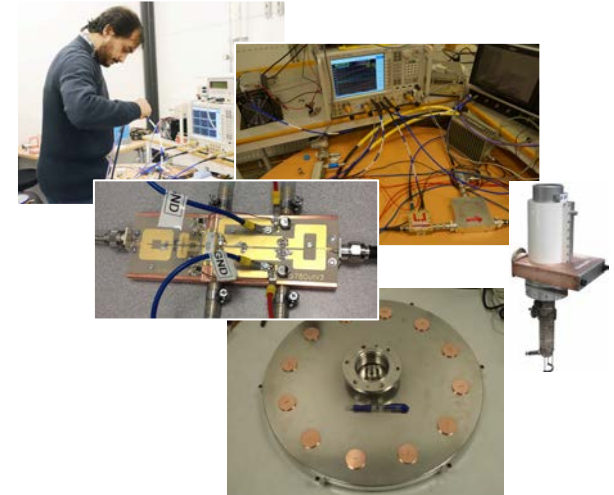
## Cryogenics



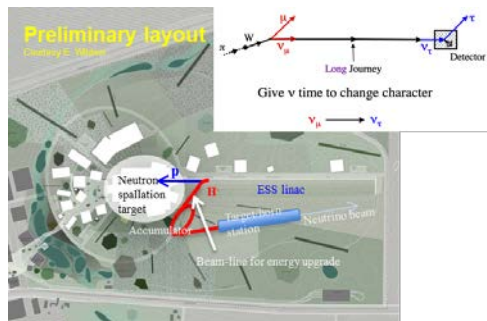
## SRF Test Stand



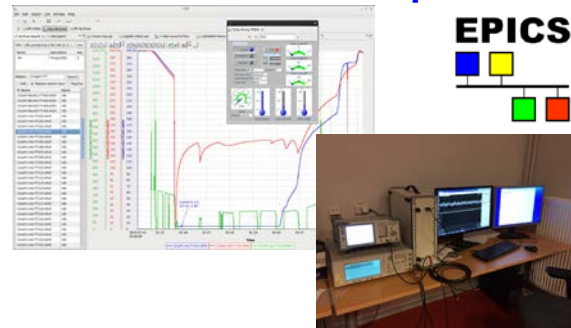
## High Power RF Amplifiers Solid-state & Vacuum Tube



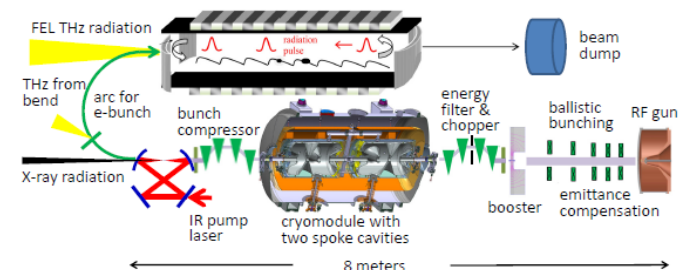
## ESS neutrino Super-beam



## Controls & Data Acquisition

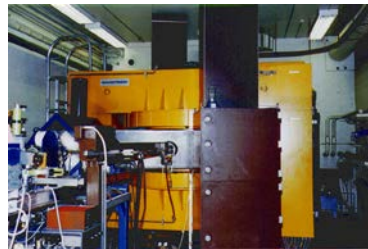


## THz-FEL



- Scanditronix

- major supplier
  - cyclotrons 1970-80's
  - PETs 1980's



- GE Medical Systems  
PET and cyclotrons

- former Scanditronix



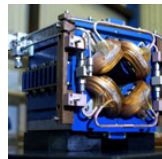
- IBA Dosimetry

- former Scanditronix Wellhöfer



- Scanditronix Magnets

- magnets



- ScandiNova

- high voltage  
pulse modulators



- Gammadata

- physics tools  
education,  
research,  
industry



- Scandion Kliniken

- proton therapy centre



- Solid-state High Power RF Amplifiers
  - medical and science applications
  - slowly replacing vacuum tubes
  - industrialize
    - optimized RF modules
    - compact combiner technology
  
- Long-pulse High Voltage Modulator
  - science applications
  - know-how & experience available, need for prototyping
  
- EPICS based Control & Interlock Systems
  - know-how & experience available
  - need for application specific development and prototyping

