Accelerator and instrumentation infrastructures in Sweden-past,current-future

- Landscape in early days
- The transition
- Current situation
- Future?

Research infrastructures for basic research in Sweden → until year ~2000

Sweden has a strong tradition of experimental research in basic science. Several research infrastructures were in operation:

- Manne Sieghbahn Laboratory (later Manne Siegbahn Institute) in Stockholm – started 1936, from 1945 operating a cyclotron and later CRYRING ion synchrotron with 52 m circumferences.
- The Swedeberg Laboratory in Uppsala – Operating from a powerful 1949 synchrocyclotron with the CELCIUS proton storage ring added in 1980:ies.
- Onsala space observatory (OSO) outside Gothenburg – Founded 1949 and was 1963 equipped with a 25m radio telescope.
- Studsvik in Nyköping – From 1959 operating a research reactor for neutron research.
- Jävan outside Lund – Starting 1963, 61 cm Cassegrain-Nasmyth optical telescope.
- Max laboratory in Lund – From 1986 operating a number of electron synchrotrons.

The transition of the Swedish infrastructure landscape ~year 2000

- The international trend of RI is that it gets bigger, more expensive → local/national research becomes international. The transition had already started in subatomic physics when CERN was established in1954. The optical astronomy was 1986 moved to the Nordic Optical Telescope (NOT) at La Palma.
- The Swedish Research Council (VR) was formed in 2001 by merging many independent research councils including two councils that in the past financed science research Naturvetenskapliga forskningsrådet (NFR) and infrastrucure Forskningsrådsnämnden (FRN)
- All RI support for all fields was merged into the Council of Research Infrastructure (RFI). The connection between research and infrastructure funding in science was lost. The connection to universities became weaker.
- In 2004 VR decided to close Manne Siegbahn Laboratory, The Swedberg Laboratory and Studsvik→ was not replaced by any organisation to support the research like NIKHEF, HIP etc...)
- The responsibility to support instrumentation and local infrastructure was given (forced on) the universities. (Unclear if universities was compensated in budget)

Current RI landscape in Sweden

- VR supports currently 2 national science RI: Max-lab that operates a synchrotron light source in Lund and the Onsala Space Obseratory outside Gothenburg that recently started focusing on contributing to the Square Kilometer Array (SKA) telescope.
- The government supports the European Spallation Source with tagged money piped through VR.
- VR supports international infrastructure projects with competitive and time limited “project” funding decided by RFI. No national base to support long-term science at international RI exists. No connection between science research and infrastructure funding at VR.
- Universities are struggling with finding a good way to support RI.

Swedish National Accelerator and Instrumentation Laboratory (SNAIL)

Sweden has no coordination of accelerator based research which has a negative effect on the field.

- Difficult for Sweden to contribute in international infrastructures.
- Difficult to keep scientific and technical competence in instrumentation
- Difficult for Universities to co-fund. instrumentation/infrastructure because split between many projects.
- Difficult to act on changes to cost and schedule.

SNAIL is an initiative to collect accelerator and instrumentation research (CERN, ESS, MAXIV, ILL, ESRF etc,) in one organisation. It aims also to support instrumentation for astronomy/astrophysics/ astroparticle physics (not part of OSO).

23 October 2023

New approach needed in Swedish research policy

An opinion piece signed by representatives of Lund and Uppsala universities and ESS was recently published in the Uppsala Nya Tidning newspaper.

Distributed organisation

The plan:

- To form a national laboratory for accelerator and instrumentation development distributed on the 4 main science centers (Gothenburg, Lund, Stockholm, Uppsala).
- Uppsala with FREIA is the only university that has a sizable infrastructure to design, build and test components hence will have a central position in the organisation.
- The current “project” based funding for participation in international/nation RI will be supported(coordinated?) trough the laboratory
- The laboratory will have base funding shared 50/50 between universities and VR

Status

- The department was ~5 years ago approaching directly ministry to get earmarked funding for FREIA. The attempt was “buried” by a investigation of national research infrastructure that lead nowhere.

- Expression of need to form a laboratory has been submitted a few time in biennal survey of needs → same expression of need has been been graded as A1 (important) three years ago to C (not at all important) one year ago.
- Discussion with heads of physics departments at main universities is positive.
- Discussion with VR leadership is positive.
- For the Uppsala physics department the formation of laboratory is one (out of 4) priority areas.
- The priority received strong support from international panel reviewing this year the “Quality and Renewal” of the university
- Still waiting for feed-back from the panel reviewing infrastructure.