



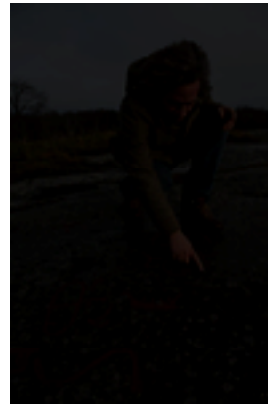
Vetenskapsrådet

# How e-infrastructures are financed

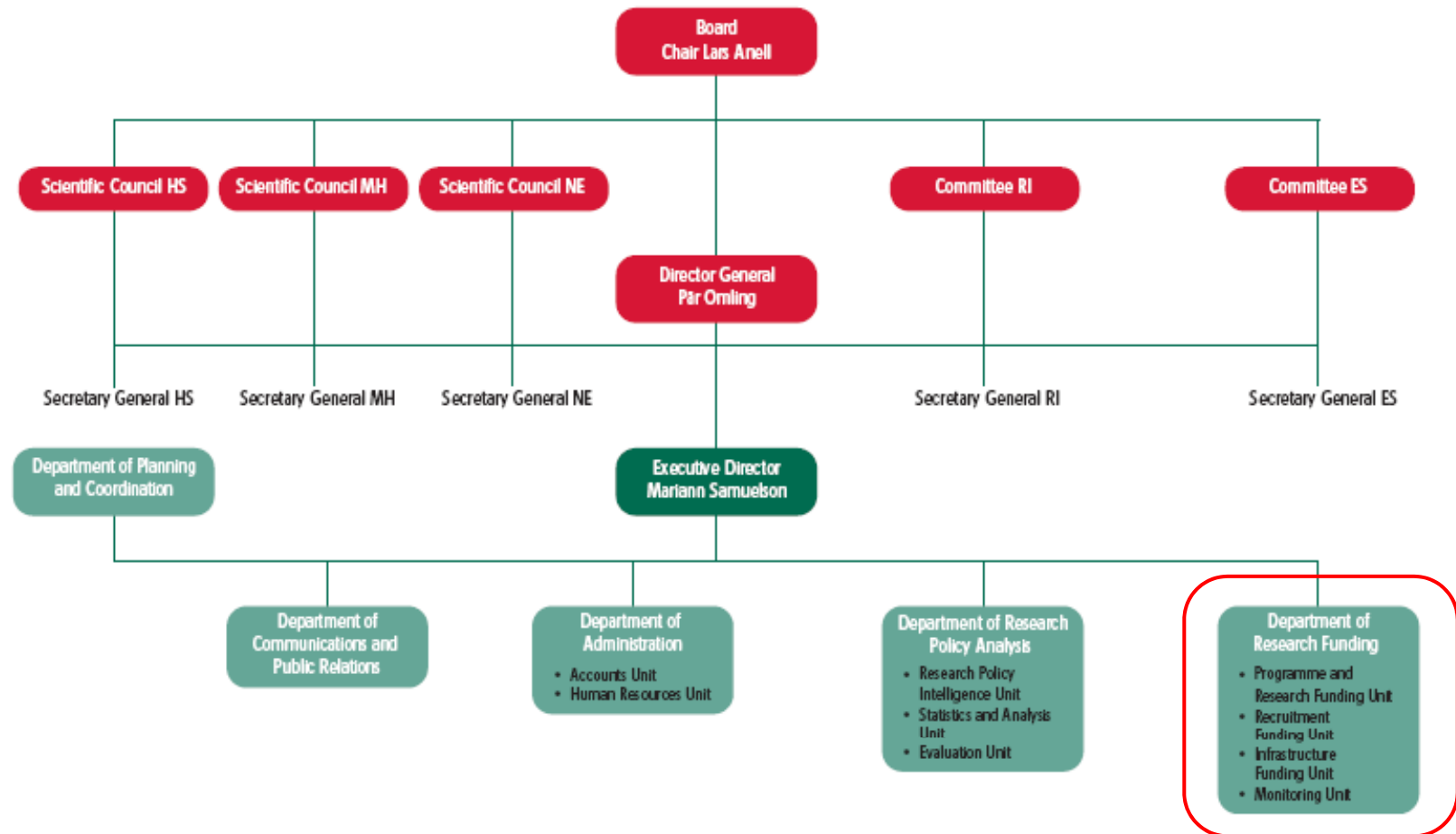
Eva Stensköld – Swedish Research Council

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- The role of the Swedish Research Council
- Collaboration – national and international
- Research infrastructures (Ris)
- E-infrastructures in Sweden
- SUNET – Sweden's NREN
- Future challenges for NRENs and memory institutions



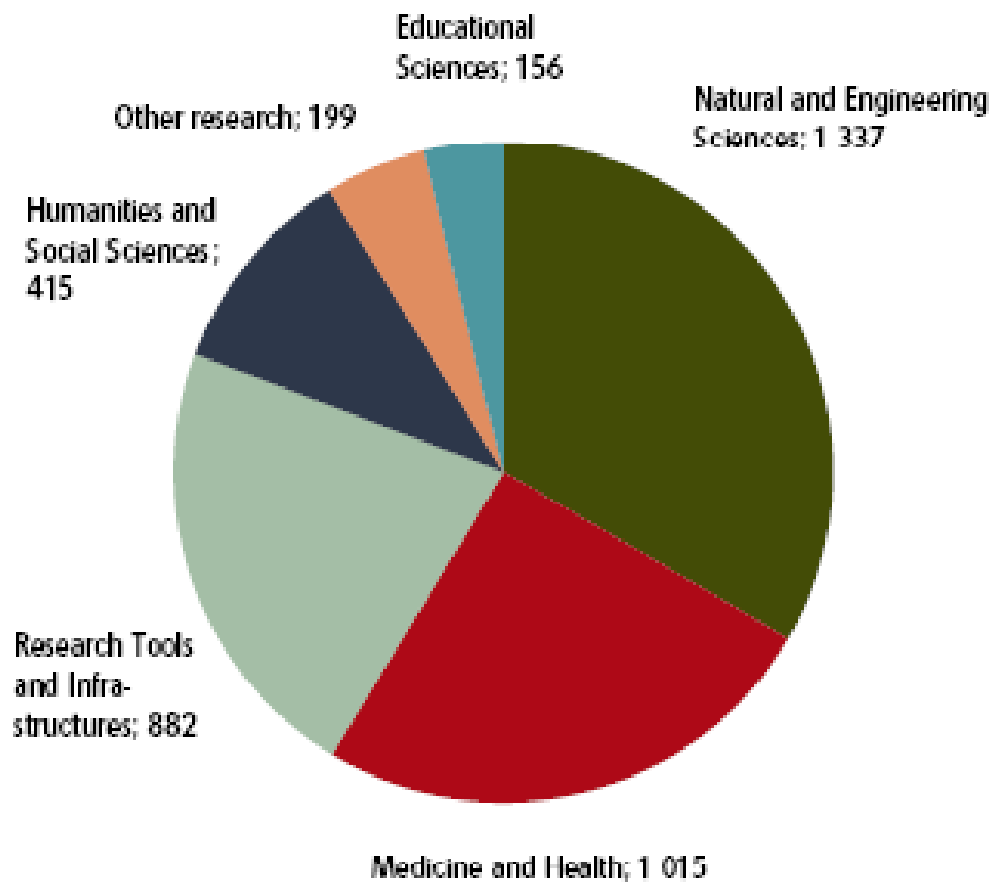
# The role of the Swedish Research Council



The Swedish NREN - SUNET

# Funding allocated in 2009

The Swedish Research Council's research funding to different areas during 2009  
(million SEK, excluding external funds).



1 million SEK=108 777 €



## Evaluation panels in Research Infrastructure:

- Infrastructures for Astronomy and Subatomic Research
- Infrastructures for Molecular, Cell and Material Research
- Infrastructures for Research on the Earth and its Near Surroundings
- Infrastructures for e-Science
- Infrastructures for Culture and Society



## What are Ris?

- The term ‘research infrastructures’ refers to facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields, ranging from social sciences to astronomy, genomics to nanotechnologies.
- RIs may be ‘single-sited’ (a single resource at a single location), ‘distributed’ (a network of distributed resources), or ‘virtual’ (the service is provided electronically).

<http://ec.europa.eu/research/infrastructures/>



# European Strategy Forum on Research Infrastructures (ESFRI)

Updated European roadmap for RI, 2008

Roadmap update scheduled for early 2011



# A Swedish roadmap for RI

The *Swedish Research Council's Guide to Infrastructure* (update scheduled for 2011) provides an overview of the long-term needs for research infrastructures to enable Swedish research of the highest quality in all scientific fields:

- Astronomy, Astro-, Nuclear-, and Particle Physics
- eScience
- Earth and Environmental Sciences
- Humanities and Social Sciences
- Materials Sciences
- Medicine and Life Sciences







# Astro-, Nuclear-, and Particle Physics

ALMA - Atacama Large Millimeter Array, radioteleskop

CERN – European organization for nuclear research

ESO – European Southern Observatory

FAIR - Facility for Antiproton and Ion Research

IceCube – South Pole Neutrino Detector

NOT – Nordic Optical Telescope

Onsala Space Observatory

E-ELT - European Extremely Large Telescope

SKA - Square Kilometre Array



# Medicine and Life Sciences

BILS/ELIXIR – Bioinformatic Infrastructure for Life Sciences

BBMRI.se – BioBanking and Molecular Resource Infrastructure of Sweden

CBCS – National small-molecule screening infrastructure

EMBL – European Molecular Biology Laboratory

IARC – International Agency for Research on Cancer

INCF – International Neuroinformatics Coordinating Facility

MIMS – the Laboratory for Molecular Infection Medicine Sweden

SNISS – Swedish National Infrastructure for Large-scale Sequencing

EATRIS – European Advanced Translational Research Infrastructure in Medicine

Infrafrontier – European Infrastructure for Phenotyping

SweImp – Swedish Infrastructure for Mouse Phenotyping



# Materials Sciences

ESRF / NORDSYNC – European Synchrotron Radiation Facility

ESS – European Spallation Source

ILL – Institut Laue-Langevin for Neutron Science

ISIS – A world centre for science with neutrons & muons

MAX-lab/MAX IV – Swedish Synchrotron Radiation Facilities

Myfab – The Swedish Micro and Nano Fabrication Network

Super-Adam – neutronreflektometer (vid ILL)

XFEL – X-Ray Free-Electron Laser

EuroFEL – frielektronlasernätverk



# Earth and Environmental Sciences

EISCAT – European Incoherent Scatter Facility & EISCAT\_3D

GBIF – Global Biodiversity Information Facility

ICOS – Integrated Carbon Observation System

IODP / ECORD – Integrated Ocean Drilling Program

Biodiversitetsportalen Artdatabanken/LifeWatch

NORDSIM –Laboratory for Isotope Geology

SND-KM – svensk nationell datatjänst för klimat- och miljödata

EMBRC – European Marine Biological Resource Centre

EMSO – European Multidisciplinary Seafloor Observatory



# Humanities and Social Sciences

CESSDA – Council Of European Social Science Data Archives

ESS – European Social Survey

EUI – European University Institute

SND – Swedish National Data Service

CLARIN – Common Language Resources and Technology



# eScience

NDGF – Nordic datagridfacility

PRACE – Partnership for Advanced Computing in Europe

DISC – Database InfraStructure Committee

SNIC – Swedish National Infrastructure for Computing

SUNET – Swedish University Computer Network

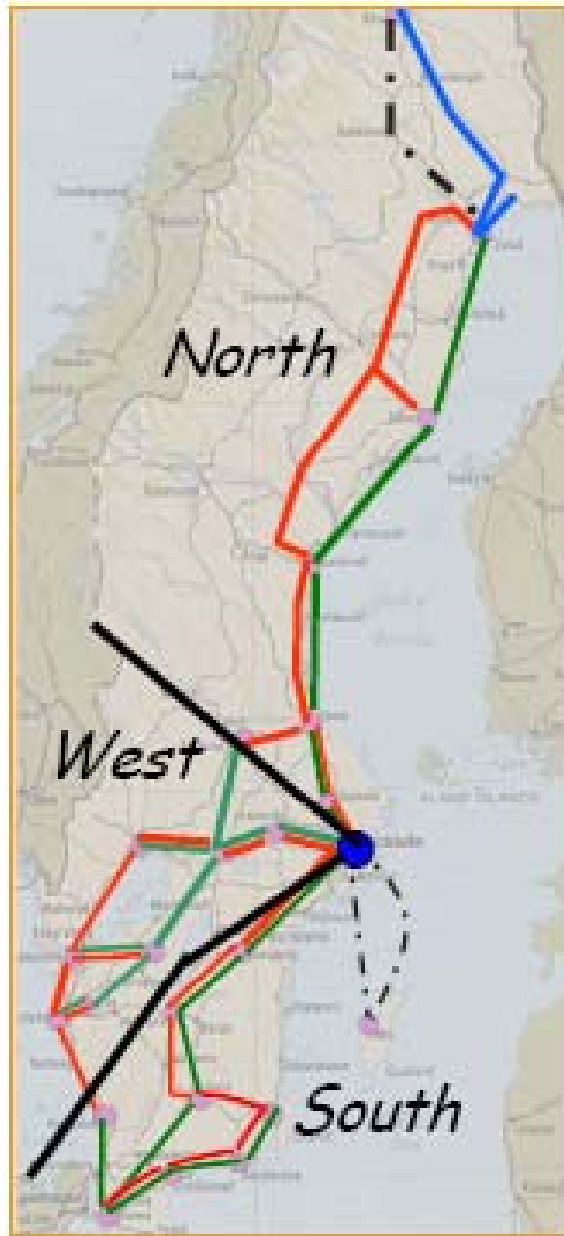


# SUNET Swedish University Computer Network

- Swedens national network for research and education
- Member/part of NORDUnet
- Advisory body at the Swedish Research Council
- Budget/year 160 Million SEK
- Services for connected organisations
- R&D

1 million SEK=108 777 €





## **SUNET**

### **3 systems**

- North, West and South (7663 km fiber)

### **2 networks (80 channels) per system**

- Red and Green
- Redundancy on layer 3

### **Fully redundant network**

- Red – Green separation

### **Support:**

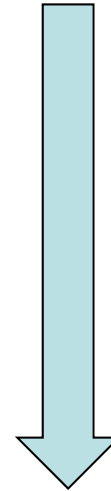
- Router connectivity
- Dedicated high bw pt-pt connectivity

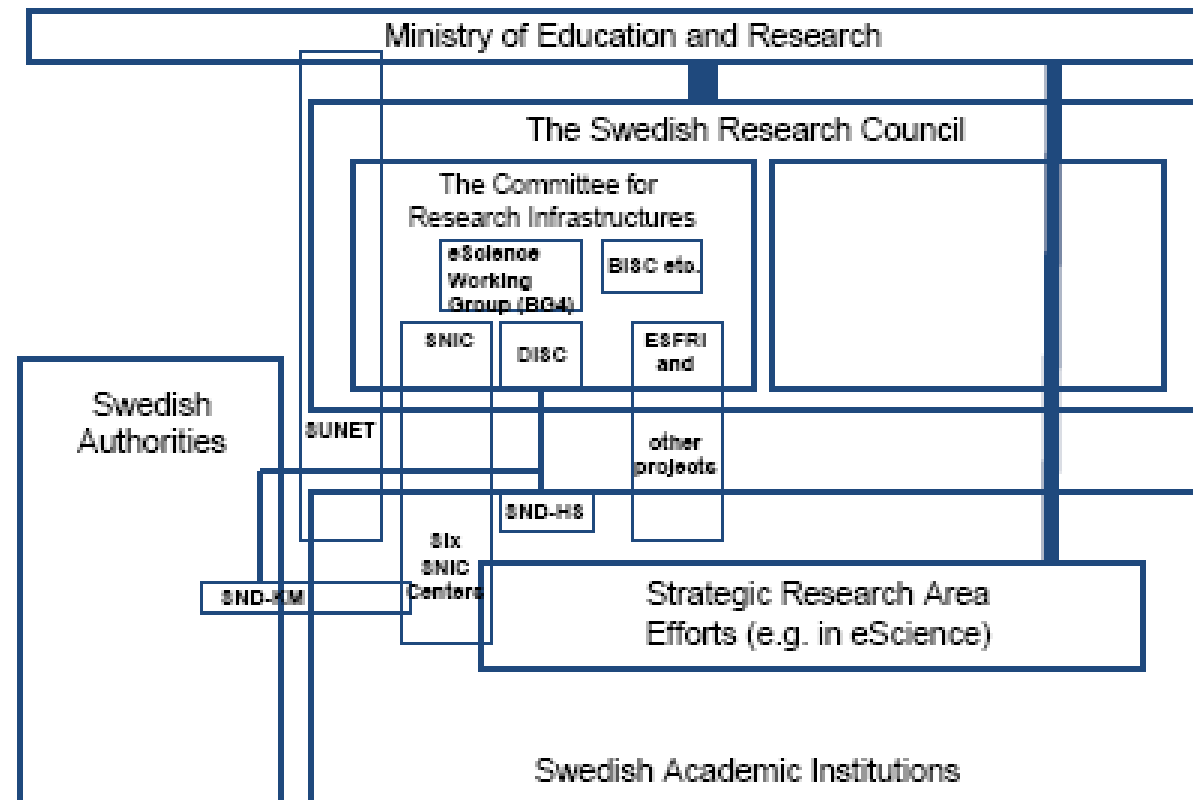
### **Cost efficient GE and 10GE**

- But also 40G+ ready

# National eInfrastructures

- Services
- Software
- Large-scale data storage
- High performance computing resources
- High capacity computer networks





The Swedish eInfrastructure ecosystem



# Challenges

- Understanding
- Communication
- Co-operation
- Funding