

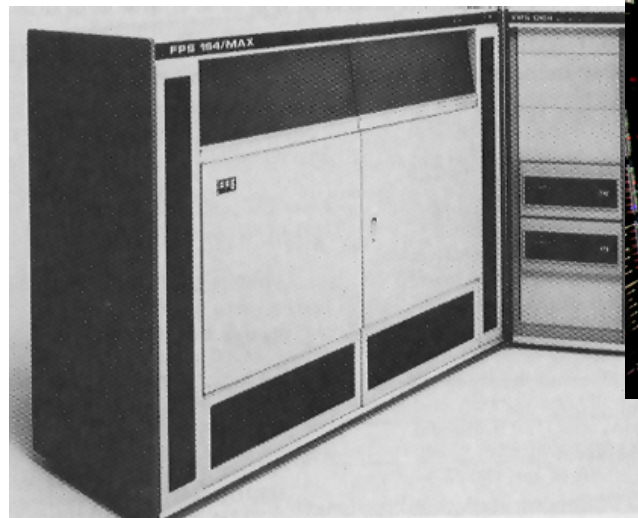


**UiO : Det matematisk-naturvitenskapelige fakultet**

# On the Role of Large-Scale Scientific Computing in Norway

**Svein Stølen**

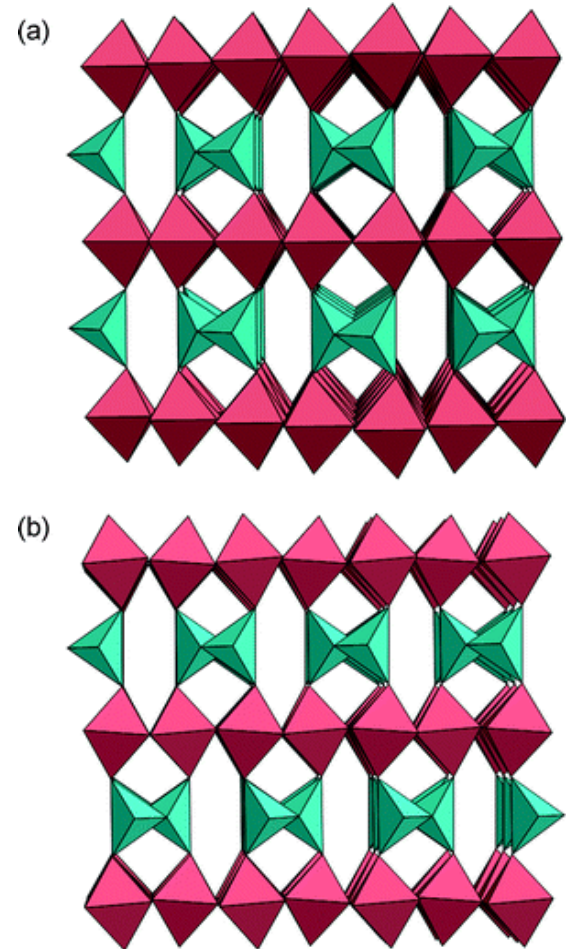
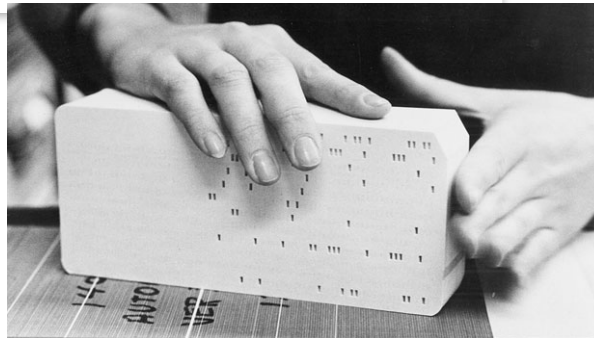
FPS164, ca. 1987



Abel, 2013



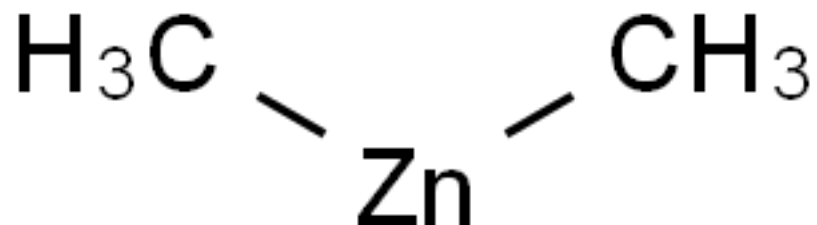
# European Synchrotron Radiation Facility, Grenoble



1980 - supercomputer - several weeks



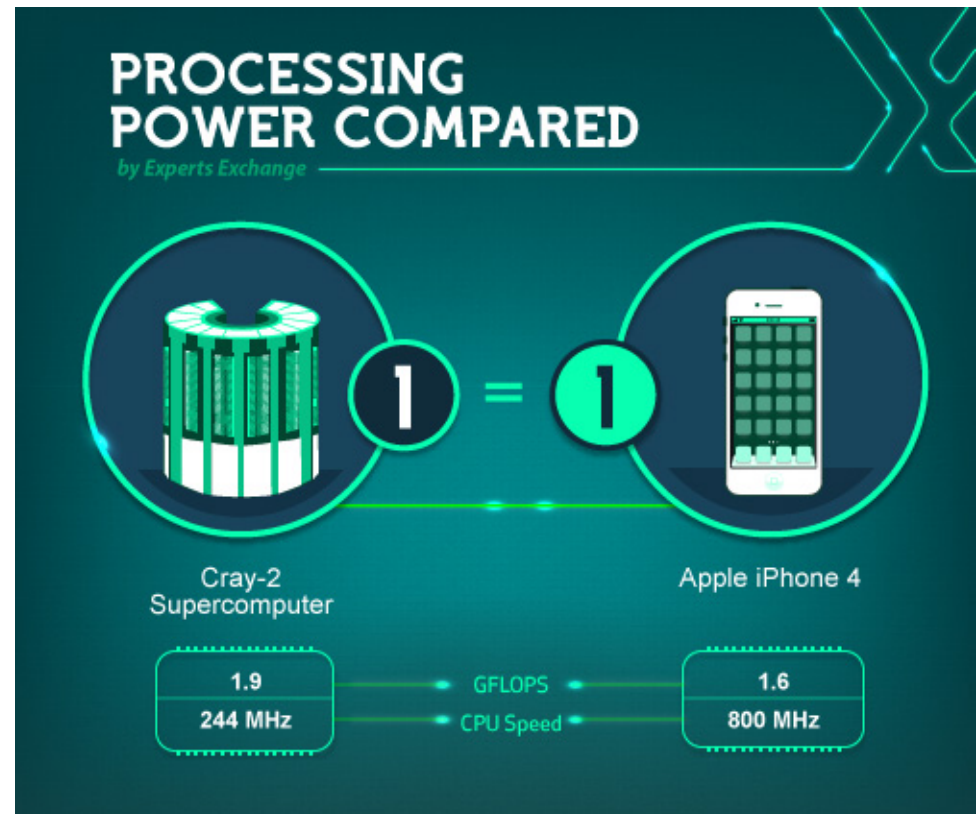
Prof. Trygve  
Helgaker,  
UiO



2000 - laptop - preparing a cup of coffee

1986 - Minnesota Supercomputer  
Institute, Minneapolis - Cray 2

Worlds fastest - privileged users



<http://pages.experts-exchange.com/processing-power-compared/>

# Superdatamaskiner på NTNU

| Maskin          | År ▼      | Prosessorer/noder | Teoretisk toppytelse |
|-----------------|-----------|-------------------|----------------------|
| Cray X-MP       | 1986-1992 | 2                 | 0,5 Gflops           |
| Cray Y-MP       | 1992-1996 | 4                 | 1,3 Gflops           |
| Intel Paragon   | 1992-1999 | 32                | 5 Gflops             |
| Cray J90        | 1995-2003 | 8                 | 1,6 Gflops           |
| Cray T3E        | 1995-2003 | 96                | 57,6 Gflops          |
| SGI Origin 2000 | 2000-2001 | 128               | 100 Gflops           |
| SGI Origin 3000 | 2001-2006 | 898               | 1 Tflop              |
| Njord (IBM)     | 2006-2011 | 1,040             | 7,8 Tflops           |
| Vilje           | 2011-     | 1,404             | 467 Tflops           |

Source: Kilde: Verktøy og vitenskap, Datahistorien ved NTNU (Ola Nordahl) [Get the data](#)

<http://www.universitetsavisa.no/forskning/2016/04/29/NTNU-får-nasjonalt-ansvar-med-ny-superdatamaskin-57202.ece>



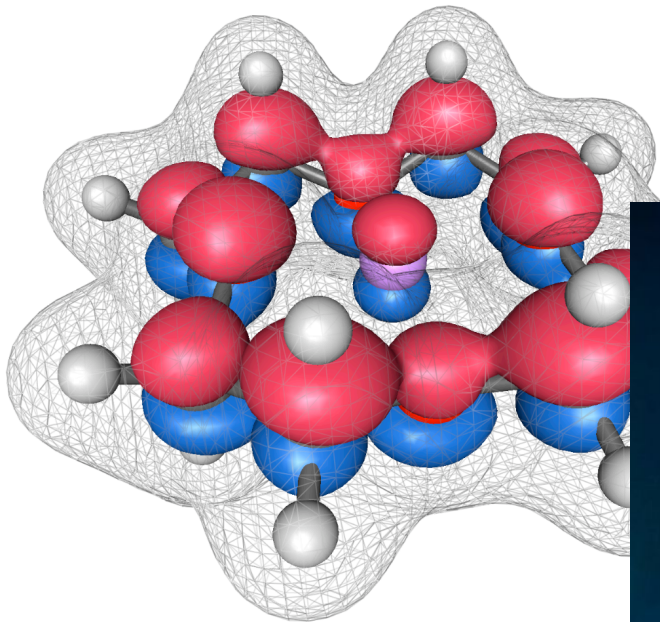
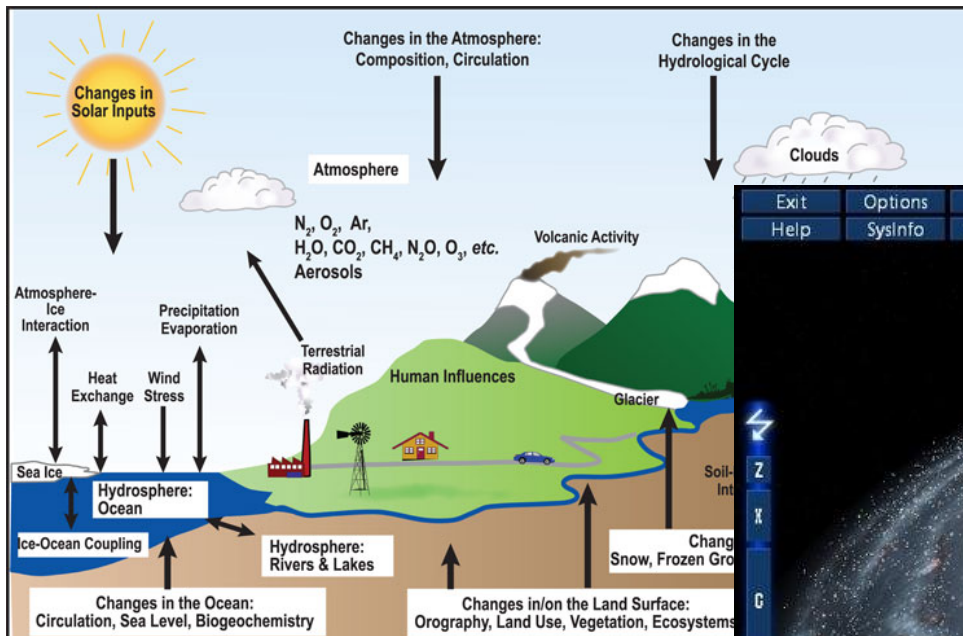
The Centre for Theoretical  
and Computational Chemistry



# Computing in Science Education



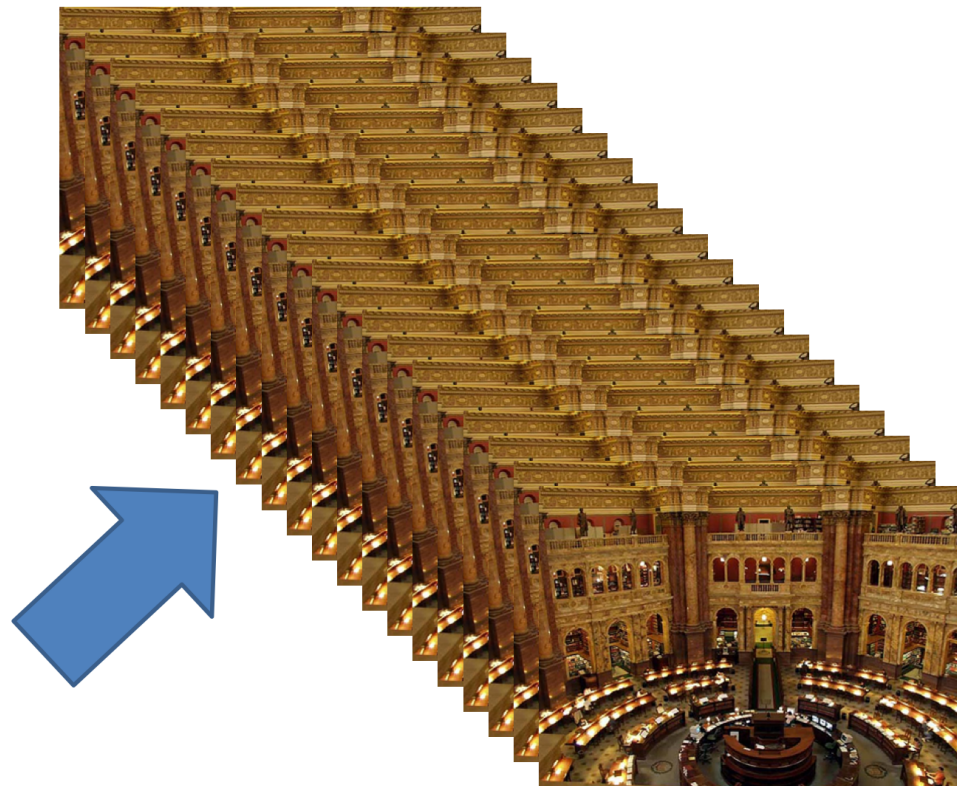
The usual suspects ..



The Times They Are A-Changin

# From code-driven to data-driven ..

1 year  
1 instrument  
1 university  
1 country



20 US Library of Congress

# The scientific case for eInfrastructure in Norway

## The eInfrastructure Scientific Opportunities Panel

[illegible]

### Overview and current status

Powerful language models promise deeper insight into the unique human cognitive capacity, better information access in our multilingual society, and a content analysis of vast archives of cultural and historical materials. The effort needed to achieve these challenges is extensive and requires a well-organised computational infrastructure and a better integration of skills from the Humanities and Social Sciences with those of Computer Science and Information Science.

Spoken language presents additional challenges. Models of speech recognition involve advanced signal processing as well as linguistic and cognitive research. Differences in voice, tempo, dialect, and other speaker characteristics are difficulties. Multimedia resources will require extensive digitisation and new approaches to annotation and interpretation to make them

Modern computational tools can provide the researcher with many parameters to dynamically control the rendering of a text for particular purposes. The interactive dynamic presentation of the Wittgenstein Archive in Bergen<sup>17</sup> provides an illustration. An immense amount of manual work has been spent encoding the text in forms suitable for exploration. Currently there is still a lack of good computational tools to support this work.

### Socio-economic relevance

In our society, faced with an information deluge, language processing is of great importance. Providers of web search and information retrieval services, such as Google and Comperio<sup>10</sup> offer a range of language-enabled services, including translation and summarisation of web pages, searching for web pages on particular topics, and summarising the results. The ability to structure the information found. Applications such as NewsExplorer<sup>11</sup> and NewsBlaster<sup>12</sup> attempt to classify, analyse, and cluster multiple news stories, producing summaries, timelines, and relevant named entities. As more people use social media, web search engines, and other applications, the need for language processing and sentiment analysis, and assembling interest groups across different languages, form attractive new areas of research. Computer Assisted Language Learning<sup>13</sup> and tools for people with language disorders or handicaps, are also of interest. The development of targeted advertisement systems is already a commercial application.

<sup>109</sup> The minimum number of edits required to transform one string into another; see [en.wikipedia.org/wiki/Levenshtein\\_distance](http://en.wikipedia.org/wiki/Levenshtein_distance).

<sup>113</sup>WAB, [wab.aksis.uib.no/transform/wab.php?modus=opsjoner](http://wab.aksis.uib.no/transform/wab.php?modus=opsjoner)

<sup>121</sup> [wab.wab.aksis.uib.no/transform/wab.php?modus=opsjoner](http://wab.wab.aksis.uib.no/transform/wab.php?modus=opsjoner)

<sup>113</sup> [newsblaster.cs.columbia.edu](http://newsblaster.cs.columbia.edu). NewsBlaster is a project of the Natural Language Processing Group at Columbia University.

<sup>116</sup>CALL, [en.wikipedia.org/wiki/Computer-assisted\\_language\\_learning](http://en.wikipedia.org/wiki/Computer-assisted_language_learning)



Slavisk-Baltisk Institutt i 1979 - scientific assistant

Prof. Geir Kjetsaa project “Written by Dostoevsky”

 This history is empty. You can load your own data or get data from an external source

*«Our vision is a scientific e-infrastructure that supports seamless access, use, re-use, and trust of data. In a sense, the physical and technical infrastructure becomes invisible and the data themselves become the infrastructure - a valuable asset, on which science, technology, the economy and society can advance.»*

**Riding the wave, 2010**