

the Square Kilometer Array (SKA)

- South Africa (and neighboring African countries), Australia, New Zealand, Canada, Chinese, Germany, Italy, Netherland, Sweden, India (Associate member)
- 2016-2024
Construction of phase one of the SKA is scheduled to start in 2016.
- €1,500 million
- <http://www.skatelescope.org/>
- The Square Kilometre Array will be the world's largest and most sensitive radio telescope. The SKA will address fundamental unanswered questions about our Universe including how the first stars and galaxies formed after the Big Bang, how galaxies have evolved since then, the role of magnetism in the cosmos, the nature of gravity, and the search for life beyond Earth.

ELI - The Extreme Light Infrastructure

- 13 EU Members Countries
- Currently built sites in Prague (Czech Republic), Szeged (Hungary) and Magurele (Romania)
- Should be operational in 2015
- €700 million + €290 million
- <http://www.extreme-light-infrastructure.eu/>
- ELI is a European Project, involving nearly 40 research and academic institutions from 13 EU Members Countries, forming a pan-European Laser facility, that aims to host the most intense lasers world-wide.

The Very Large Telescope array (VLT)

- facility in Chile
- A collaboration between several European countries
- Instruments (MIDI and AMBER) operate respectively in 2002 and 2004
- <https://www.eso.org/public/teles-instr/vlt.html>
- The Very Large Telescope array (VLT) is the flagship facility for European ground-based astronomy at the beginning of the third Millennium. It is the world's most advanced optical instrument, consisting of four Unit Telescopes with main mirrors of 8.2m diameter and four movable 1.8m diameter Auxiliary Telescopes.

The Large Hadron Collider (LHC)

- Facility on Franco-Swiss border, a collaboration of 10,000 scientists and engineers from over 100 countries

- It will operate for two months in 2013 and go shutdown for upgrades. Reopening planned for early 2015
- <http://public.web.cern.ch/public/en/lhc/lhc-en.html>
<http://lhc.web.cern.ch/lhc/>
- The Large Hadron Collider (LHC) is a gigantic scientific instrument near Geneva, where it spans the border between Switzerland and France about 100m underground. It is a particle accelerator used by physicists to study the smallest known particles – the fundamental building blocks of all things.

International Space Station (ISS)

- NASA, the Russian Federal Space Agency, Japan Aerospace Exploration Agency (JAXA), European Space Agency (ESA), Canadian Space Agency (CSA)
- 1998-2020
- \$45billion
- http://www.nasa.gov/mission_pages/station/main/index.html

NEPTUNE Canada undersea observatory

- Canada
- Instruments generally installed in 2011/2012, currently in operation
- Annual \$12,000,000
- <http://www.neptunecanada.com/>
- NEPTUNE Canada, the world's first regional-scale cabled observatory network, is located off the west coast of Vancouver Island, British Columbia. The network, which extends across the Juan de Fuca plate, gathers live data from a rich constellation of instruments deployed in a broad spectrum of undersea environments. Data are transmitted via high-speed fibre optic communications from the seafloor to an innovative data archival system at the University of Victoria.

ITER (International Thermonuclear Experimental Reactor)

- € 15 billion
- facility in France
- funded and run by EU, India, Japan, China, Russia, South Korea and the U.S
- Buildings began in 2010, expected to be realized in 2020
- <http://www.iter.org/>
- ITER is a large-scale scientific experiment that aims to demonstrate that it is possible to produce commercial energy from fusion.

Atacama Large Millimeter/sub-millimeter Array (ALMA)

- Facility in Chile
- An international partnership between Europe, the United States, Canada, East Asia and the Republic of Chile
- More than \$1 billion
- start full-scale operation in 2013
- <http://www.almaobservatory.org/>

- ALMA is the largest astronomical project in existence. ALMA will be a single telescope of revolutionary design, composed initially of 66 high precision antennas located on the Chajnantor plateau, 5000 meters altitude in northern Chile.

FAIR - An International Facility for Antiproton and Ion Research

- Facility in Germany
- Current partners: Finland, France, India, Poland, Romania, Russia, Slovenia, Spain and Sweden
- will operate from 2018
- <http://www.fair-center.eu/>
- FAIR is a new, unique international accelerator facility for the research with antiprotons and ions. It is ready to be built within the coming years near Darmstadt in Hesse, Germany. The new facility, where various physics programs can be operated in parallel, will offer outstanding research opportunities and discovery potential for about 3000 scientists from about 50 countries.

Compact Linear Collider (CLIC)—Proposed

- CLIC is a global, multi-lateral collaboration of 43 institutes from 22 countries.
- conceptual design report of the CLIC accelerator is planned to be completed in 2012.
- <http://clic-study.web.cern.ch/clic-study/>
- CLIC (Compact Linear Collider) is a study for a future electron-positron collider that would allow physicists to explore a new energy region in the multi TeV range beyond the capabilities of today's particle accelerators.

International Linear Collider (ILC) - Proposed

- The proposed host countries for the accelerator are Japan, Europe (CERN) and the USA (Fermilab). Japan is considered most likely candidate.
- In 2013, the International Linear Collider and the Compact Linear Collider (CLIC) merge to form one Linear Collider Collaboration
- <http://www.linearcollider.org/>
- ILC could be the next big adventure in particle physics. Currently at the planning stage, it would complement the Large Hadron Collider at CERN and shed more light on the discoveries scientists are likely to make there in the coming years.

ENCODE: Encyclopedia of DNA Elements

- <http://www.genome.gov/10005107>
- The Encyclopedia of DNA Elements (ENCODE) Consortium is an international collaboration of research groups funded by the National Human Genome Research Institute (NHGRI). The goal of ENCODE is to build a comprehensive parts list of functional elements in the human genome, including elements that act at the protein and RNA levels, and regulatory elements that control cells and circumstances in which a gene is active.

1000 Genomes Project

- U.S, Canada, EU, UK, China, the Caribbean
- Launched in 2003 and scaled in 2007
- <http://www.1000genomes.org/>

- The 1000 Genomes Project is the first project to sequence the genomes of a large number of people, to provide a comprehensive resource on human genetic variation. The goal of the 1000 Genomes Project is to find most genetic variants that have frequencies of at least 1% in the populations studied. It is a collaboration of numerous public and private organizations worldwide with Amazon Web Service cloud to share genetic data with researchers everywhere.

The Sloan Digital Sky Survey

- U.S, EU, Japan, UK, China
- (SDSS-I, 2000-2005; SDSS-II, 2005-2008; SDSS-III ongoing)
SDSS-III will continue operating and releasing data through 2014
- <http://www.sdss.org/>
- The Sloan Digital Sky Survey (SDSS) is one of the most ambitious and influential surveys in the history of astronomy. Over eight years of operations (SDSS-I, 2000-2005; SDSS-II, 2005-2008), it obtained deep, multi-color images covering more than a quarter of the sky and created 3-dimensional maps containing more than 930,000 galaxies and more than 120,000 quasars.

Southern Hemisphere's first full-scale gravity wave observatory (GWO)

- Italy, France, China, Taiwan and the USA, likely Australia

Neuroscience Information Framework (NIF)

- led by UC San Diego
- established in 2004; project ongoing
- <http://www.neuinfo.org/>
- The Neuroscience Information Framework is a dynamic inventory of Web-based neuroscience resources: data, materials, and tools accessible via any computer connected to the Internet. An initiative of the NIH Blueprint for Neuroscience Research, NIF advances neuroscience research by enabling discovery and access to public research data and tools worldwide through an open source, networked environment.

iPlant Collaborative

- established in 2008; project ongoing
- <http://www.iplantcollaborative.org/>
- iPlant is a community of researchers, educators, and students working to enrich all plant sciences through the development of cyberinfrastructure - the physical computing resources, collaborative environment, virtual machine resources, and

interoperable analysis software and data services– that are essential components of modern biology.

National Ecological Observatory Network

- Expected to be in full operation by 2017; NEON will collect data for 30 years
- <http://www.neoninc.org/>
- NEON is designed to gather and synthesize data on the impacts of climate change, land use change and invasive species on natural resources and biodiversity. Data will be collected from 60 sites across the U.S. (including Alaska, Hawaii and Puerto Rico)

Pacific Rim Applications and Grid Middleware Assembly (PRAGMA)

- established in 2002; project ongoing
- <http://www.pragma-grid.net/>
- The Pacific Rim Application and Grid Middleware Assembly (PRAGMA) was formed in 2002 to establish sustained collaborations and advance the use of grid technologies in applications among a community of investigators working with leading institutions around the Pacific Rim.

Kbase

- Production Release on Feb 2013
- <http://kbase.science.energy.gov/>
- The new Systems Biology Knowledgebase (KBase) is a collaborative effort designed to accelerate our understanding of microbes, microbial communities, and plants. It will be a community-driven, extensible and scalable open-source software framework and application system.

C4 Rice

- 2008
- \$ 5million per year
- <http://c4rice.irri.org/>
- Converting the photosynthetic system in rice to the more efficient, supercharged C4 one used by maize would increase rice yields while using scarce resources (land, water, fertilizer) more effectively. However a technological innovation of this magnitude requires the skills and technologies of a global alliance of multidisciplinary partners from advanced institutions.

Ocean Observatories Initiative (OOI)

- Infrastructure installation from 2013-2015
- <http://www.oceanobservatories.org/>
- The Ocean Observatories Initiative (OOI) will construct a networked infrastructure of science-driven sensor systems to measure the physical, chemical, geological and biological variables in the ocean and seafloor. The OOI will be one fully integrated system collecting data on coastal, regional and global scales.

GEON

- established in 2002; project ongoing
- <http://www.geongrid.org/>
- GEON is an open collaborative project that is developing cyberinfrastructure for integration of 3 and 4 dimensional earth science data. GEON is developing the OpenEarth Framework (OEF) to facilitate such integration.