UiO : Det matematisk-naturvitenskapelige fakultet

Knowledge Development in a Changing World

Science and Technology towards 2030

Morten Dæhlen
dean

Movie!

Science and technology at UiO

Profile areas

Digitalization and computational science

Life science | Earth and space sciences | Energy and materials science

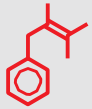
Departments


Biosciences


Pharmacy


Geo-sciences


Mathematics


Chemistry


Physics


Informatics


Astro-physics


Technology Systems


Centre for Science Education

Other relevant units

The Science Library

Natural History Museum

Norwegian Centre for Molecular Medicine

Knowledge development
in a changing world

Kunnskapsutvikling
for en verden i endring

Realfag
og teknologi

A proud history

Selected highlights from our history

Peter Waage og Cato M. Guldberg: Formulerte massevirkningsloven – den eneste naturloven som er funnet av norske forskere

1864

Kristian Birkeland: knyttet til etableringen av Norsk Hydro (nå Yara), løste nordlysgåten

1905

Odd Hassel: fikk nobelprisen i kjemi i 1969

1969

Livsvitenskapsbygget står klart

2024

1833

Observatoriet: Fakultetets første bygg

1900

Kristine Bonnevie: ble første kvinnelige professor i 1900, drivkraft i utviklingen av biologi i Norge

1907

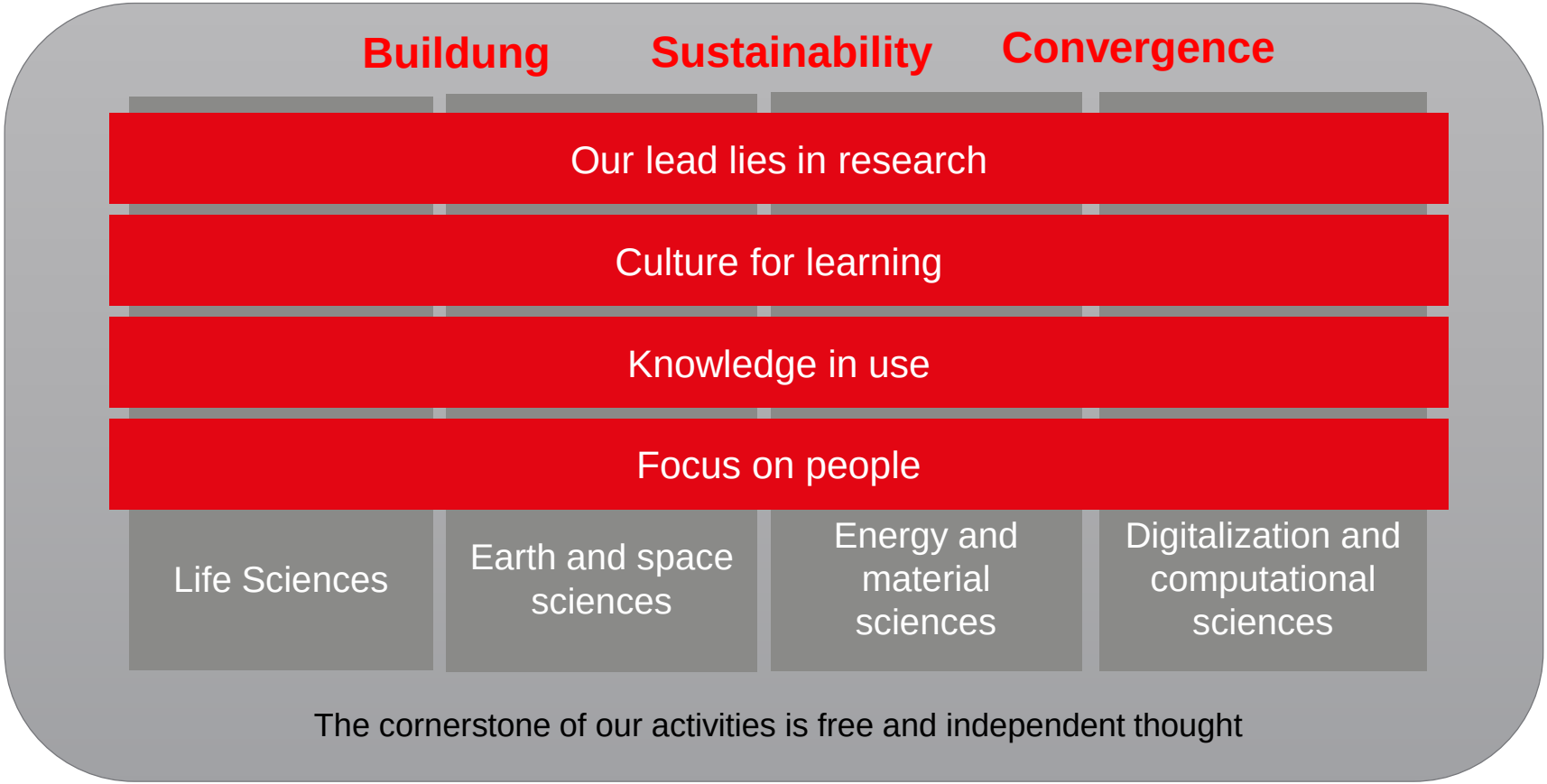
Waldemar Christopher Brøgger: geolog, valgt til universitetets første rektor i 1907

1922

Fridtjof Nansen: professor i zoologi og oseanografi. Fikk Nobels fredspris i 1922 for sitt humanitære og fredsskapende arbeid som generalsekretær i Folkeforbundet

2001

Kristen Nygaard og Ole-Johan Dahl: fikk Turing-prisen i 2001 (Informatikkens nobelpris)


Buildung
Sustainability
Convergence
Our lead lies in research
Culture for learning
Knowledge in use
Focus on people
Life Sciences
Earth and space sciences
Energy and material sciences
Digitalization and computational sciences
The cornerstone of our activities is free and independent thought

The sustainable development goals express a long-term need for change that requires a considerable effort by the entire world.

The Faculty has significant capacity in this area, both with regard to understanding problems and in terms of finding new solutions that are necessary for a sustainable development of the society.

Convergence and an interdisciplinary approach are needed to solve the challenges articulated in the sustainable development goals.

Bildung has a natural association with the Faculty's ambitions to contribute more strongly to sustainable development of the society

Sustainability: The world is facing major challenges. These challenges have been formulated well in the UN's sustainability development goals. The sustainable development goals express a long-term need for change that requires a considerable effort by the entire world. As a major and important contributor to important fields, the Faculty has a significant responsibility for ensuring that basic research and higher education are linked to these major global challenges. The Faculty's employees have a significant capacity in this area, both with regard to understanding problems and in terms of finding new solutions that are necessary for sustainable social development.

Convergence: Convergence is when several different factors – subjects, methods or ideas – that have different points of departure approach each other and form a whole. Convergence leads to the creation of new forms of work and new fields. Convergence creates new ideas and gives rise to new issues that nurture academic disciplines and develop these further. Convergence mirrors a dynamic cross-sector mindset and is becoming increasingly more important in modern knowledge development. Convergence and an interdisciplinary approach are needed to solve the challenges articulated in the sustainable development goals.

Bildung: Integrity, ethical reflection, mutual respect, constructive interaction and compassionate attitudes shall permeate the Faculty's activities. Our research-focused education programmes shall give students a basic understanding of the significance of knowledge development throughout history and into the future. Knowledge of how the physical world is interconnected has an intrinsic value. Bildung entails an admirable combination of general knowledge, insight, respect and conduct. Bildung has a natural association with the Faculty's ambitions to contribute more strongly to sustainable social development.

Life sciences

Life sciences are all about understanding the make-up, structure and function of living organisms, and how living organisms mutually affect each other and interact with their environments. *Life sciences* are of key importance for enabling society to meet major challenges in respect of health, food, climate and the environment. The Faculty engages in extensive and interdisciplinary cooperation locally, nationally and internationally on understanding and treating disease. With regard to research under the heading *earth and space sciences*, our researchers in the field of *life sciences* are keen to understand the processes and phenomena affecting the environment and climate. Our researchers, across the Faculty's units, participate in large projects together with other health care environments at the University of Oslo and the university hospitals. These projects involve researchers from the majority of the Faculty's subject areas, and increasingly researchers from humanistic and social science disciplines. The Faculty's focus on *life sciences* represents a large and important part of UiO:Life Science, which is a large interdisciplinary initiative to enhance the level of quality and interaction in research, education and innovation in *life sciences* across the various units at the University of Oslo.

Earth and space sciences

Earth and space sciences encompass studies of the earth we live on and the infinitely large universe we are a part of. The research ranges from the interior and surface of the earth, via the atmosphere of the earth to the solar system, sun, stars and on to the galaxies and the entire universe. The research is applied to a broad range of areas such as the understanding of processes that form hydrocarbons and valuable minerals on the surface of the earth, how carbon can be stored in the earth's crust, and how water circulates on the surface of the earth – in the oceans, on land and in the atmosphere. Atmospheric research provides better and more precise weather forecasts and a greater understanding of climate change. Other research provides answers to questions that people have been asking ever since the dawn of mankind: what are the beautiful northern lights and how do they affect vital systems on earth, what is the connection between processes on the sun and on earth, whether life exists elsewhere in the universe, when and how was the universe created, what does it consist of and when and how will it end, and what is mankind's place in it all?

Energy and material sciences

Sustainable social development will require a fundamental conversion to renewable energy supplies and the production of materials, with a dramatically different environmental footprint. *Energy and material sciences* include research on materials for the production and storage of energy and the development of technology for the energy systems of the future. Basic research on physical and chemical material properties is fundamental to the development of better, more efficient and environmentally friendly solar cells, batteries, fuel cells and catalysts. Energy systems encompass how the individual components work together in a system, the integration of renewable energy sources and how "smart" systems can make the distribution and consumption of energy more efficient. The Faculty shall develop knowledge and solutions for the necessary conversion to sustainable energy systems and help ensure that everyone has access to energy that is clean, affordable, reliable and socially fair. The Faculty's focus on *energy and material sciences* represents a large and important part of UiO:Energy, which is an interdisciplinary initiative designed to enhance the level of quality and interaction in research, education and innovation in renewable energy across the various units at the University of Oslo.

Digitalisation and computational science

The basis for the Faculty's focus on *digitalisation and computational science* is naturally linked to basic knowledge development in computer science and mathematics. The use of advanced computations in combination with other knowledge, from, for example, the Faculty's other thematic initiatives – *life sciences, earth and space sciences* and *energy and material sciences*, is becoming increasingly important. Data science, including machine learning and computational science, are key areas on which the Faculty focuses and where it has strong academic communities across the various subject areas and entities. Digitalisation is a driver of convergence between the various disciplines, which will in turn create opportunities for addressing problems that require radical interdisciplinary approaches. The Faculty's commitment to digitalisation is comprehensive and is being developed in order to support international cooperation on research and education. This commitment concerns how we shall design and use secure information systems in the future, etc. The use of digital resources is also of key importance in research and education, and a large share of our interaction with businesses and entities in the public sector concerns the development and use of digital resources.

Life on earth affect the environment and climate.

Renewable energy and efficient energy systems

Earth and space sciences are very much about environment and climate.

Key enabling technologies to reach the SDGs


1 UTRYDDE FATTIGDOM
2 UTRYDDE SULT
3 GOD HELSE
4 GOD UTDANNING
5 LIKESTILLING MELLOM KJØNNENE
6 RENT VANN OG GODE SANITÆRFORHOLD
7 REN ENERGI FOR ALLE
8 ANSTENDIG ARBEID OG ØKONOMISK VEKST
9 INNOVASJON OG INFRASTRUKTUR
10 MINDRE ULIKHET
11 BÆREKRAFTIGE BYER OG SAMFUNN
12 ANSVARLIG FORBRUK OG PRODUKSJON
13 STOPPE KLIMAENDRINGENE
14 LIV UNDER VANN
15 LIV PÅ LAND
16 FRED OG RETTFERDIGHET
17 SAMARBEID FOR Å NÅ MÅLENE
FNs BÆREKRAFTSMÅL