Science with Arctic Attitude

University of Oulu
3 April 2019
University of Oulu founded 1958

Multidisciplinary research and education

- Natural Sciences and Mathematics
- Biosciences
- Medicine and Health
- Economics and Business Administration
- Engineering and Architecture
- Information and Communication Technologies
- Education
- Humanities

55 000+ Alumni
13 000 Students
2 900 Staff
<table>
<thead>
<tr>
<th>Key figures</th>
<th>Funding total in 2017 M€</th>
<th>Bachelor’s degrees in 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>in 2017 M€</td>
<td>226</td>
<td>1181</td>
</tr>
<tr>
<td>Research based spin-off companies since 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in 2018</td>
<td>67</td>
<td>1315</td>
</tr>
<tr>
<td>Invention disclosures in 2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in 2018</td>
<td>35</td>
<td>199</td>
</tr>
<tr>
<td>International rankings</td>
<td>251 – 600</td>
<td></td>
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<tr>
<td>in top 3% of the world’s universities</td>
<td></td>
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<tr>
<td>Scientific publications in 2018</td>
<td>2 532</td>
<td></td>
</tr>
<tr>
<td>Degrees in 2018</td>
<td>2 695</td>
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</table>
Performance in the major university rankings – within global top 3%

**ARWU (Shanghai)**
Academic Ranking of World Universities

501–600 ↓ national ranking 5

**Times Higher Education**
World University Rankings

251–300 → national ranking 4

**QS**
World University Rankings

376 ↑ national ranking 6

**CWTS Leiden ranking**

491 → national ranking 4

**NTU**
National Taiwan University Ranking

427 ↓ national ranking 5

**CWUR**
Center for World University Rankings

365 → national ranking 4
Pushing the boundaries of the known for a more sustainable, healthy and intelligent world

Environmental change
- Scarcity of natural resources
- Growing global population
- Increasing human life expectancy
- Rising wealth
- Urbanization
- Digitalization

We contribute to solving some of the greatest global challenges in our areas of strength.

Our work creates new research-based knowledge, educates future talents and sparks innovations.
Our strategy is based on five thematic, internationally significant research focus areas:

- **Digital solutions in sensing and interactions**
- **Understanding humans in change**
- **Earth and near-space system and environmental change**
- **Creating sustainability by materials and systems**
- **Molecular and environmental basis for life-long health**
Scientific profiling areas

- UBIQUITOUS WIRELESS SENSOR SYSTEM
- INORGANIC SIDE STREAMS
- 6G-ENABLED WIRELESS SMART SOCIETY
- STRENGTHENING HUMAN CAPABILITIES IN DIGITAL ERA
- PHYSICS FOR SUSTAINABLE STEEL
- DATA INSIGHT FOR HIGH-DIMENSIONAL DYNAMICS
- DIGITALIZED SOLUTIONS FOR FUTURE HEALTHCARE
- ARCTIC INTERACTIONS AND GLOBAL CHANGE
- NEAR-EARTH SPACE ENVIRONMENT
- FIBROSIS IN CHRONIC DISEASES AND CANCER
Our research benefits people living at all latitudes, but we utilize our location as one of the Northern-most universities in the world.

**Arctic Agenda**

Research and innovation regarding e.g. sustainable utilization of natural resources, near-Earth space environment, logistics, technology, and cultures in the Arctic.

**University of the Arctic** is a cooperative, multidisciplinary network of over 170 universities, research institutes and other organizations concerned with education and research related to the Arctic.

**Joint arctic agenda in collaboration with**

- Luleå University of Technology, Sweden
- Umeå University, Sweden
- UIT The Arctic University of Norway
- University of Lapland, Finland
The University of Oulu aims to be among the best places in the world to do research in our focus areas.

- Research community with high-ambition and critical mass
- Competitive research infrastructures
- Attractive employer for top academic talents
- Career paths for promising researchers
- Promotes the principles of open access research
Education
We encourage each student to achieve his/her full academic potential

• High-level research combined with a welcoming atmosphere creates a unique environment for students to enjoy learning
• High-quality degree programs attract engaged students
• Excellent student experience
• Effective doctoral training
• International environment
• Graduates are competent experts capable of creating successful, lifelong careers
International
## International cooperation

Functioning in international science networks is the foundation for the University’s renewal and development.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Master’s Programmes</td>
<td>21</td>
</tr>
<tr>
<td>Erasmus network: No. of agreements</td>
<td>486</td>
</tr>
<tr>
<td>Double Degree Programmes (Master’s and Doctoral)</td>
<td>7</td>
</tr>
<tr>
<td>Erasmus network: Partner Universities</td>
<td>308</td>
</tr>
<tr>
<td>Different nationalities in the university community</td>
<td>93</td>
</tr>
<tr>
<td>Bilateral cooperation agreements with universities</td>
<td>60</td>
</tr>
<tr>
<td>International staff</td>
<td>475</td>
</tr>
<tr>
<td>International students</td>
<td>1015</td>
</tr>
<tr>
<td>Exchange students</td>
<td>563</td>
</tr>
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</table>
Campuses
- **University of Oulu**
  - Linnanmaa campus, Oulu
  - Kontinkangas campus, Oulu
  - Sodankylä Geophysical Observatory
  - Oulanka Research Station, Kuusamo
  - Kajaani University Consortium
  - Kokkola University Consortium
  - Kerttu Saalasti Institute, Nivala

- **Summer University of Northern Ostrobothnia**
  - Oulu, Kuusamo, Pyhäjärvi, Raahe, Ylivieska
Linnanmaa Campus - City of science and innovation

6 Faculties under the same roof
3 Focus Institutes, Thule Institute
Tellus Innovation Arena

VTT Technical Research Centre of Finland
Natural Resources Institute Finland (LUKE)
Finnish Environment Institute (SYKE)

Teacher Training School
Botanical Gardens

Oulu University of Applied Sciences will move into the same campus in 2020

Sports hall
Ice skating rink

Student housing
Student housing
Student housing

University leadership and services
Kontinkangas Life Science Campus

- 2 Faculties, Biocenter Oulu
- Oulu University of Applied Sciences, Health education
- University Hospital Medical Research Center
- Oulu City Hospital
- Student housing
- ICT, health and bio companies
- Technopolis (Medipolis) company facilitator
- Finnish Institute of Occupational Health (TTL)
- National Institute for Health and Welfare (THL)
- Dentopolis
Innovation
Research and innovations rooted at the University of Oulu have changed the world

- 2.6 billion people around the world use daily telecom technology developed in Oulu. Several generations of mobile phone technology have been created here.
- Basic research and seminal innovations for heart rate monitors for consumers were made by our researchers.
- Novel therapeutics have been discovered and commercialized based on our biomedical research.
- The first internet chat system was built at our university.
I think Oulu is the world's best place, second to none, for radio access engineering.

— Rajeev Suri, CEO, Nokia
Polar has designed the world’s first wireless wearable heart rate monitor.

The company was founded in 1977 by Seppo Säynäjäkangas, an electronical engineering professor in the University of Oulu.

Polar heart rate monitors give training guidance based on ECG-accurate heart rate.

Company’s products combine knowhow in sports, physiology, and electronics.

Polar employs 1200 people worldwide, has 26 subsidiaries globally, and operates in more than 80 countries.
We participate actively in the Oulu Innovation Alliance, a regional strategic consortium of research and innovation. More than 60 research-based startups have been born in the University of Oulu during the last ten years.

Few examples:

- **IndoorAtlas** – geomagnetic indoor positioning technology
- **Valossa Labs** – video artificial intelligence
- **KNL Networks** – connection systems utilizing high frequency terrestrial radio for e.g. shipping
- **Cerenion** – method for measuring the brain function of intensive care patients
- **Chain Antimicrobials** – antimicrobial peptide coated catheters to prevent hospital-acquired infections
- **Codenomicon** – cybersecurity solutions and automated software testing tools. Acquired by Synopsys, Inc in 2015.
- **Sensinode** – software technology for the internet of things (IoT). Acquired by ARM in 2013.
We drive innovation by encouraging multi-disciplinary thinking, and by fostering collaboration.

We train competent, adaptable professionals who are able to apply their knowledge and create novel solutions for real-life challenges.

Entrepreneurship programs are integrated into our curricula to respond to the changes in the job market.

Support for entrepreneurship in and startups in many ways:

**University Innovation Centre** – offer support for research-based innovations, university-company collaboration and business development.

**Tellus Innovation Arena** – coworking space, community building and co-creation

**Minor studies in Entrepreneurship** available for all students
Alumni
Over 55 000 alumni – including

Martti Ahtisaari
Peace mediator
United Nations diplomat
Nobel Peace Prize laureate 2008
President of Finland 1994–2000
Honorary Doctor 1980
Graduate 1959

Leena Peltonen-Palotie
– 2010
2009 Finnish Science Academician
Helped to found the UCLA
Department of Human Genetics
MD 1976, PhD 1978

Paula Vanninen
Director of Verifin, Finnish Institute for Verification of the Chemical Weapons Convention
M.Sc. 1984, PhD 1992

Jarkko Oikarinen (WiZ)
Technical Lead Manager at Google
Inventor of the first Internet chat network, Internet Relay Chat (IRC)
Master of Science (Tech.) 1992, PhD 1999

Baylie Damtie
President, Bahir Dar University, Ethiopia
Academic Vice President (Provost), Bahir Dar University
PhD in Physics 2004

Jussi Pesonen
President and Chief Executive Officer, UPM
M.Sc. (Eng.)

Kaisa Hietala
Has worked as:
EVP for Renewable Products at Neste
Senior VP, Passenger Traffic, VR-Group
M.Sc. (Eng.) 1995

Anssi Lassila
OCOPEA Office for Peripheral Architecture
Finlandia Prize for Architecture 2015 for Puukuokka
Among winners of the American Architecture Prize 2016
Architect 2002

Anne Stenros
CEO, Creative Catalyst Oy
Chief Design Officer CDO, City of Helsinki
Design Director, Kone Corporation
Architect 1981

Sakari Orava
Sports medicine surgeon, physician, orthopedist and professor
Client list includes Real Madrid, FC Barcelona, Chelsea FC and Juventus
MD 1972, PhD 1980

Over 55 000 alumni – including
Attractive, renewing University of high impact

High impact is based on the excellent competence of our people, and on everyone contributing their utmost in their own role.

We have to be an attractive university for top academic talents, potential students and collaboration partners. We want to strengthen our relationship with our alumni.

Leadership is based on a balanced development of professional expertise, efficiency and wellbeing at all levels.

Universities are facing a challenge for renewal. Everyone is encouraged to re-think and develop their own work and ways of working.
President of Finland Urho Kekkonen signs the University of Oulu act on July 8th, 1958
Opening Ceremony for the first Academic Year took place in October 1959.

We will continue to work – For the Next Generation