Aalto University
School of Engineering

Russia - Finland: prospects and development of international cooperation in the field of shipbuilding

Pentti Kujala
Professor, Vice Dean (Research)
Aalto University

07.02.2021

Merger of three leading Finnish universities

1849 Helsinki University of Technology

1871 University of Art and Design Helsinki

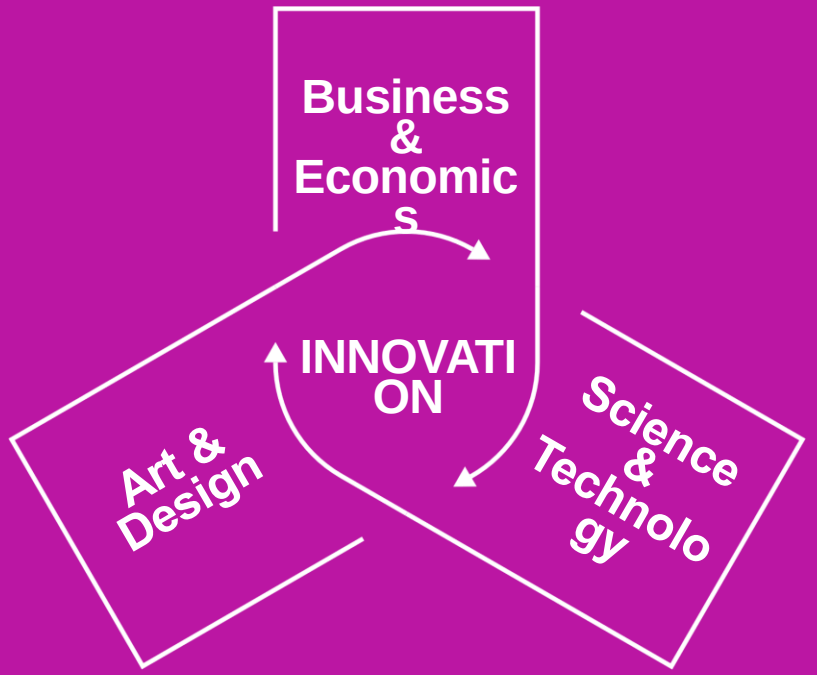
1911 Helsinki School of Economics

Aalto University 2010

Aalto University

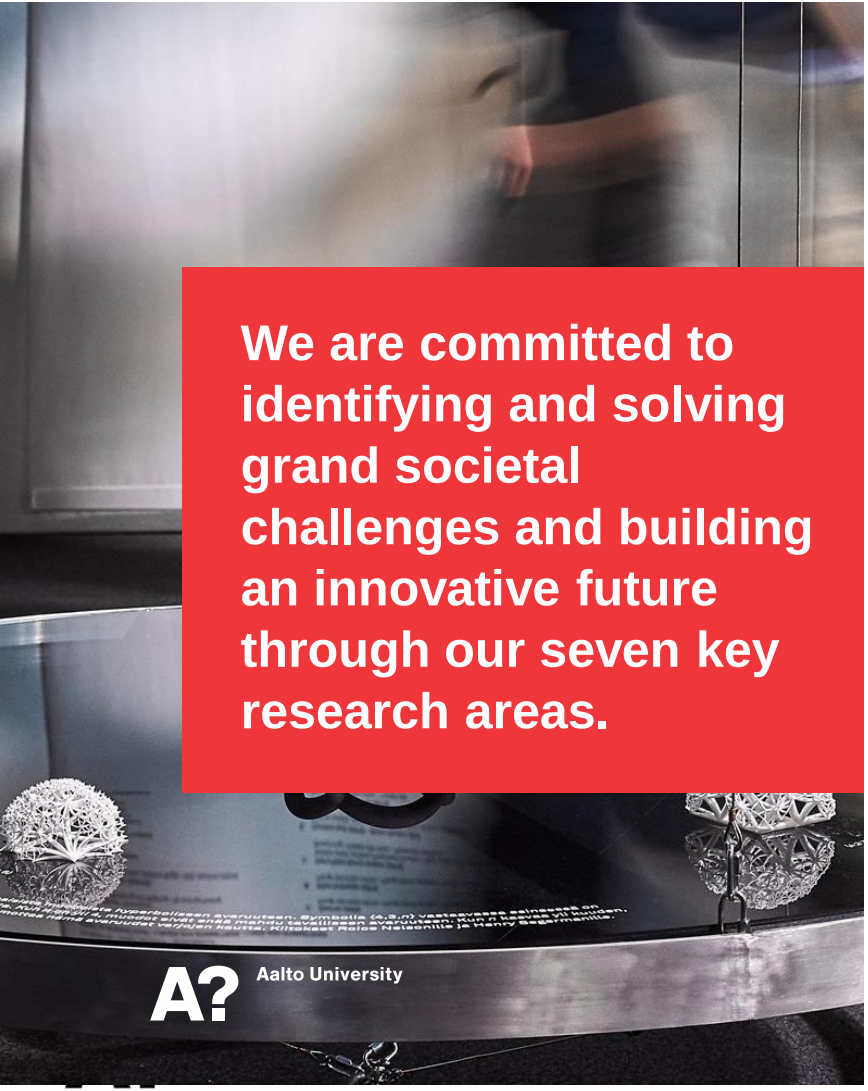
National mission

Strengthening Finland's innovative capacity through first-class research, art and education.

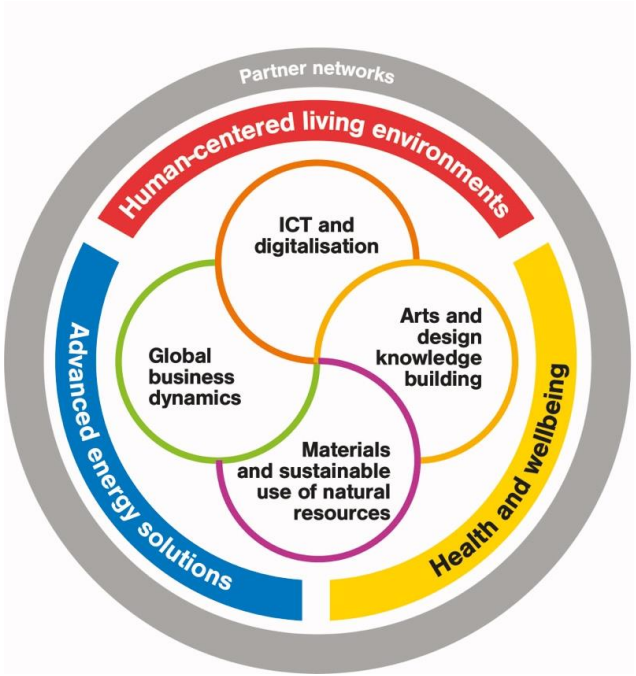


Aalto University

School of Engineering



Innovative research



Amongst the best young universities in the world

Top young universities

9th

best young university in the world

QS Top 50 under 50, 2021

Top most international universities

35th

most international university in the world

THE 2021

Aalto University

Six dynamic schools

School of Arts, Design and Architecture
architecture; art; design; media; film, television and scenography

School of Business
accounting; economics; finance; management studies; marketing; information and service management

School of Chemical Engineering
bioproducts and biosystems; chemistry and materials science; chemical and metallurgical engineering

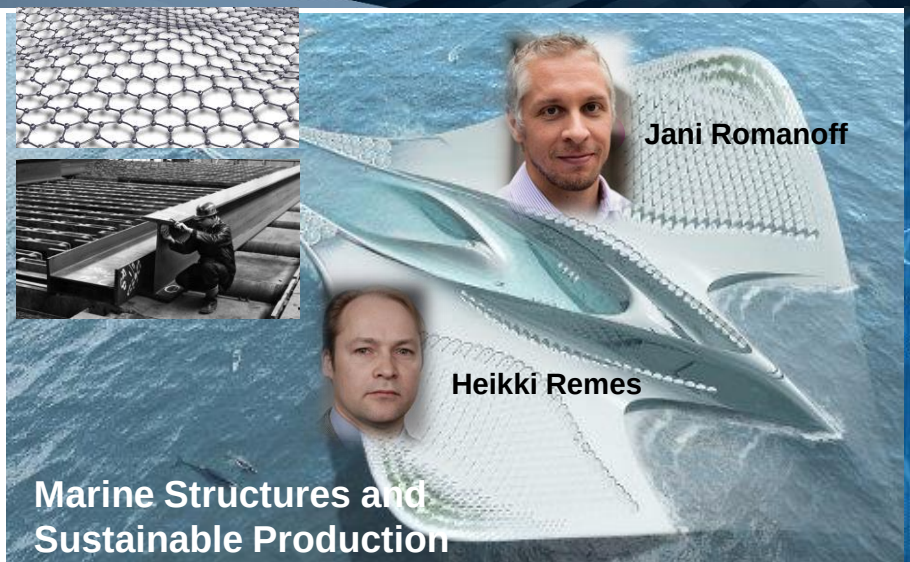
School of Electrical Engineering
communications and networking; electronics and nanoengineering; electrical engineering and automation; signal processing and acoustics

School of Engineering
built environment; civil engineering; mechanical engineering

School of Science
applied physics; computer science; industrial engineering and management; mathematics and systems analysis; neuroscience and biomedical engineering

Aalto University

Marine Technology, Focus areas and Faculty Members



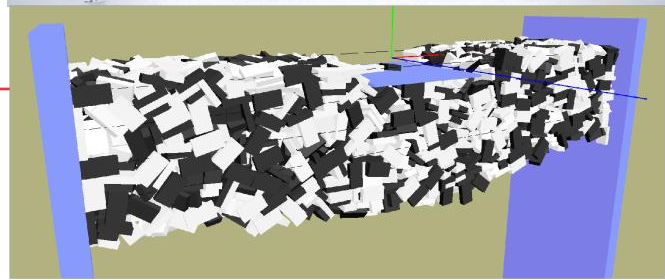
Arctic Research at Aalto

Research focus area in Aalto ENG

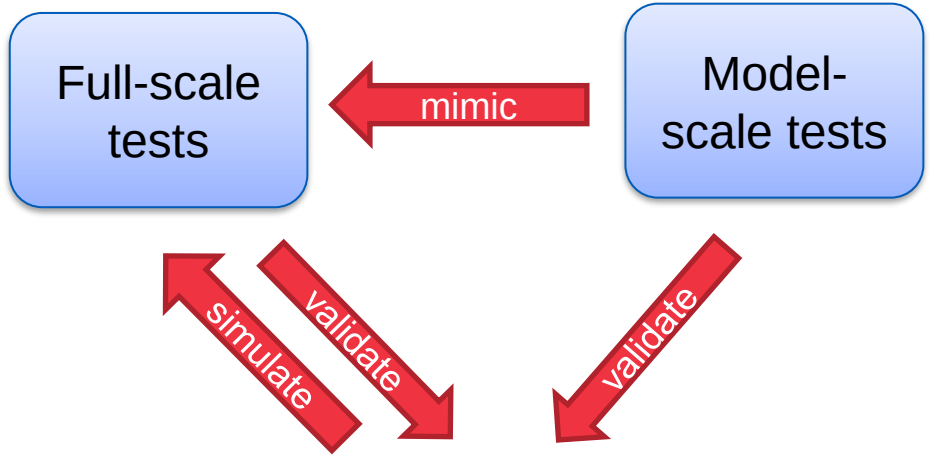
- 3+ professors, lab manager, 4 post docs, 10 doct students
- Aalto Ice Tank,
- 7 professors in 5 countries (FIN, NOR, CAN, GER, NL)
- NEW:
- - NTNU, DTU Nordic co-operation

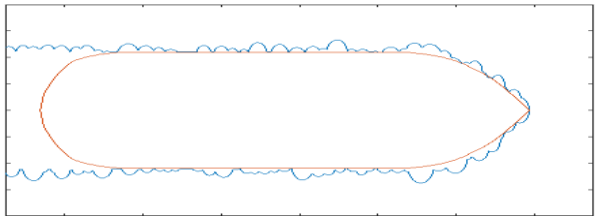
Main international networks

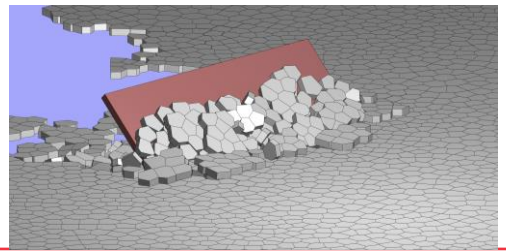
- LRF Center: *Arctic Shipping and Operations, 2013 – 2021* Aalto, NTNU, MUN, TUHH, UH; Risk and safety
- SAMCoT, Center for Arctic Marine Technology at NTNU, 2012-2019: Ice mechanics
- IUTAM Symposium on Physics and Mechanics of Sea Ice, 2019



Full-scale – Laboratory – Modeling







Risk-based design framework demonstration

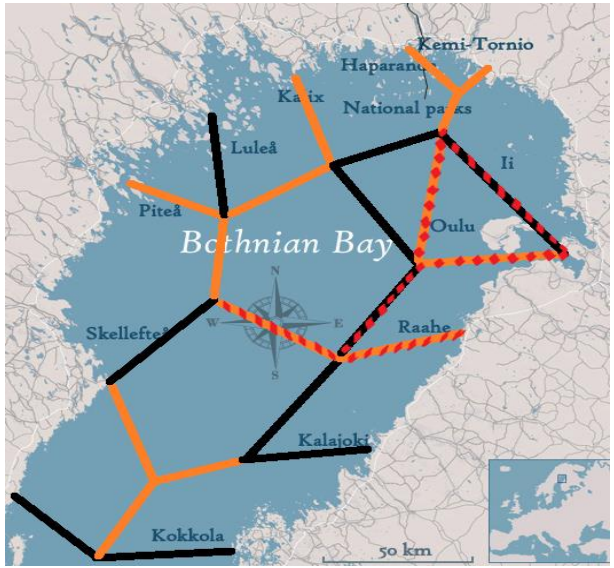
Demonstration case together with Aker Arctic

- Design of a 5,000 TEU containership for an extended summer season (July – December) operation along the Northern Sea Route
- Application of our new approach for risk/goal-based design of Arctic ships developed within SEDNA
  - *Focus on hull structural design*
    - Weight comparison between a standard 'rule-based' and a new 'risk/goal-based' structural design

The Venta Maersk on the Northern Sea Route in September 2018. (Source: Courtesy of Maersk)

Other Ongoing Research

- Simulation model for winter navigation system of Finland, funded by LVM, Väylävirasto, TRAFICOM, Research question: How many icebreakers we need on 2030 ?
- INFUTURE , Future potential of Inland Waterways, 2018-2021, The South-eastern Finland – Russia CBC 2014-2020
- SIMREC, Simulators for improving cross-border oil spill response in extreme conditions, 2019-2022. South-East Finland-Russia CBC program.



Courtesy: Aker Arctic

THANK YOU FOR YOUR ATTENTION !