TKI Åbo Akademissa

- TKI ja osaamisen ennakointi startti – webinaari
- Mikko Helle

Åbo Akademi

Founded in 1918, at the site of the original Royal Akademi in Åbo founded in 1640.

Four faculties

- Faculty of Science and Engineering (FNT)
- Faculty of Social Science, Business, Economics and Law
- Faculty of Education and Welfare studies
- Faculty of Arts, Psychology and Theology

Two campuses: in Åbo, Turku and Vasa, 5700 students. Finland's only Swedish speaking university.

ÅAU in a nutshell

1100

Employees in total, 650 working in teaching and research

5700

Undergraduate students and 780 postgraduate students

1300

Scientific publications per year

101

The overall annual budget (2020) was approx. 99 million euro, including about 42 million euro in external funding.

20%

The percentage of Finnish speaking students

2010

Åbo Akademi University becomes an independent corporation under public law.

Faculty of Science and Engineering

Be the solution.

Key Figures FNT

1150
students

200
PhD students

330
employees

5+3
5 study programs + 3 international Master's programs

15 M€
external financing (40 % of budget)

460
peer-review publications per year

OUR MISSION

To develop solutions and processes that slow down climate change, promotes a cleaner environment and healthier sea. To find methods for detecting, treating and preventing diseases.

Åbo Akademi

Faculty stucture

Åbo Akademi

IT

Mathematics

Geology

Physics

Biochemistry & Cell Biology

Pharmacy

Environ-
mental
& Marine
Biology

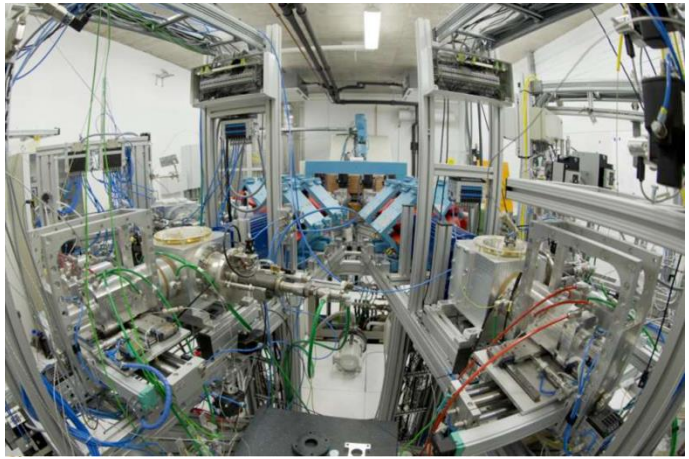
Chemistry
& Chemical
Technology

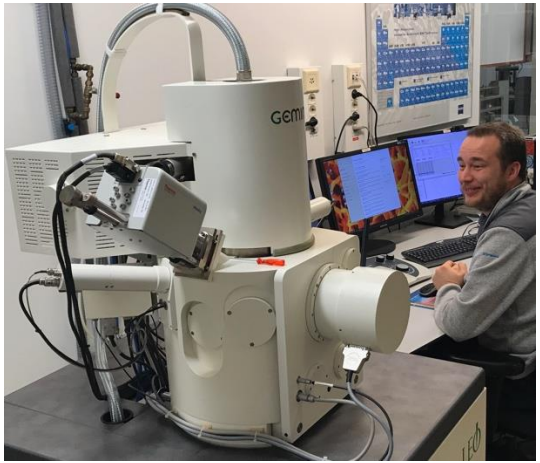
Process
& Energy
Technology

Experimental research

Åbo Akademi

- About 500 larger instrument at FNT
- About 18 000 chemicals och 400 gas cylinders
- Field stations
- Extensive research laboratories





Sidfot

Research

The strategic profile areas in research at ÅAU-FNT are

Technologies for a sustainable future

Soliutions for Health

The Sea

Technologies for a sustainable future

- Combining process & chemical engineering and materials technology at molecular level:
- Developing advanced nature-based materials and technologies from biomedical research to large scale processing of industrial streams.

Solutions for health

- Biomedical imaging
- Drug pre-formulation and diagnostics, with a focus on cancer
- Organic chemistry and biochemistry
- Structural bioinformatics
- Cellular and molecular biology, and materials research

The Sea

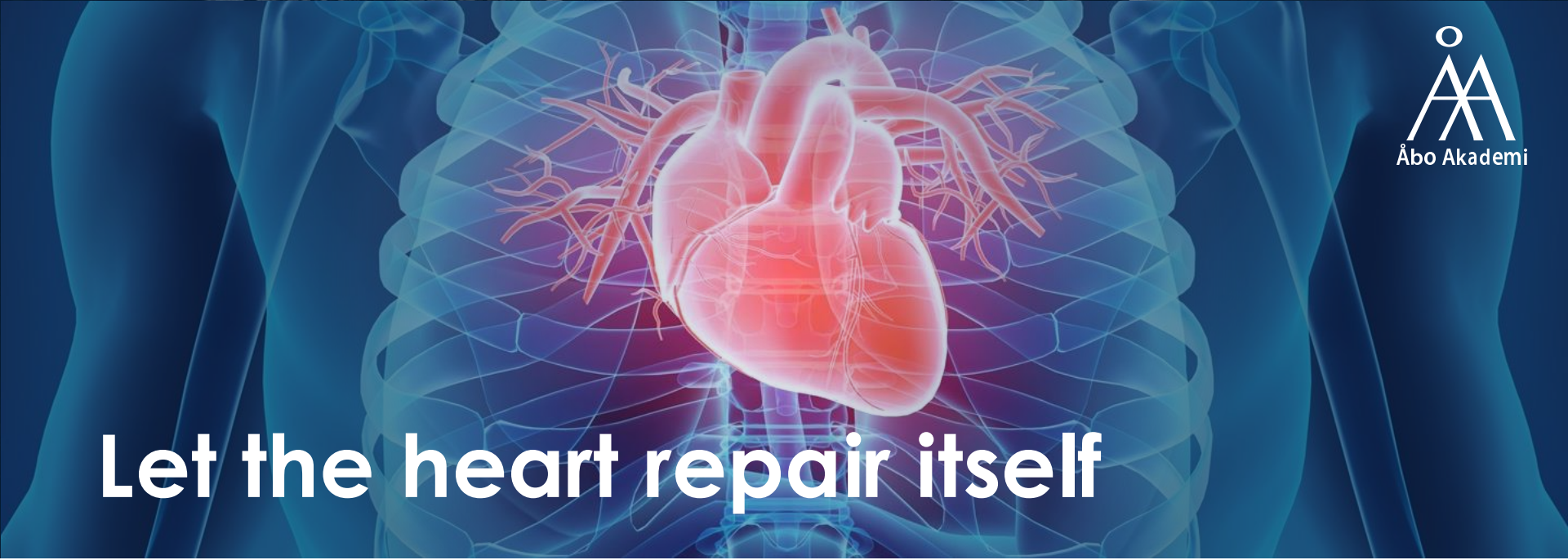
- The research has focus on marine biology, regulation and other steering mechanisms as well as maritime logistics and trade, with the Baltic Sea serving as a global model.
- Within the cross-disciplinary entity, researchers collaborate in environmental and marine biology, public administration and the industrial economy.

A world free from fossil fuels

Bild: Nicklas Hägen

Why not produce gasoline, diesel and aircraft fuel from, for example, felling residues, sugar beets or food residues?

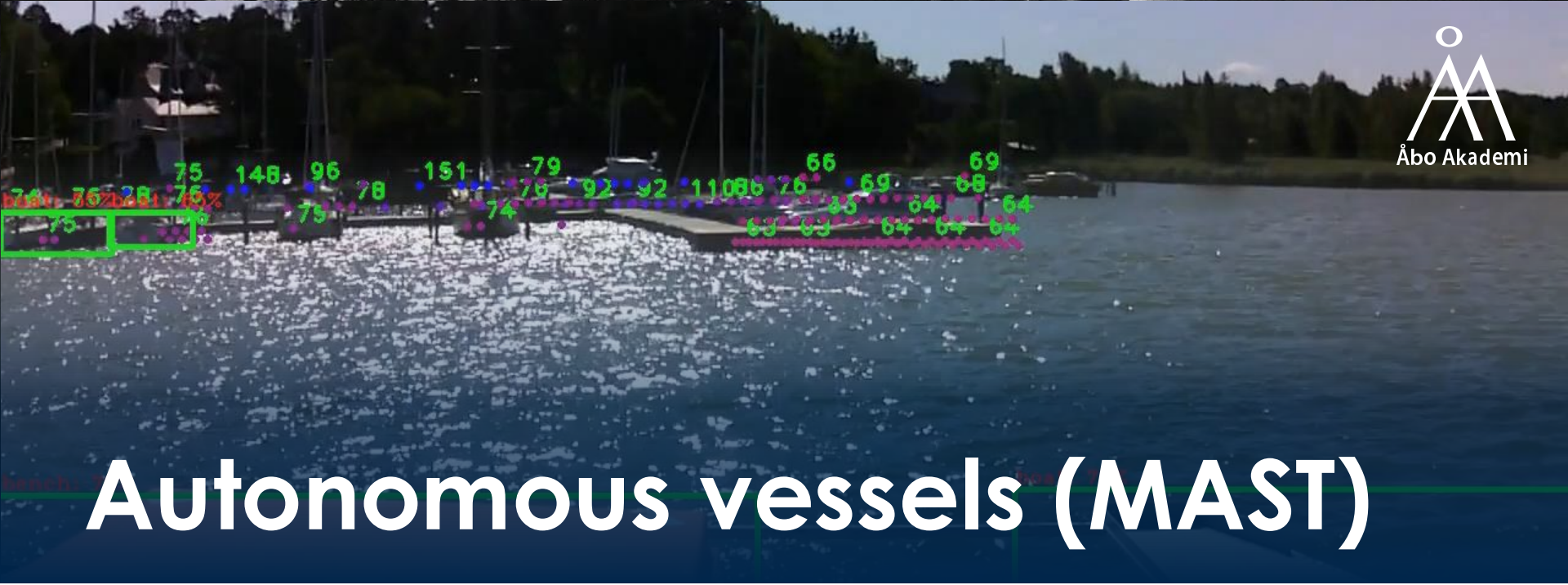
Jyri-Pekka Mikkola, professor at Åbo Akademi and University of Umeå, has developed a process and a catalyst that produces diesel and gasoline compounds when ethanol that reacts with catalysts is fed into the reaction. These are then easily refined into fuels - without a single fossil component.



Let the heart repair itself

Research on the Notch signal range opens opportunities to find ways for a damaged heart to repair itself.

By activating the latent repair mechanisms of the heart muscle, we strive to repair damage caused by a heart attack in the future, says Cecilia Sahlgren, professor of cell biology.



Autonomous vessels (MAST)

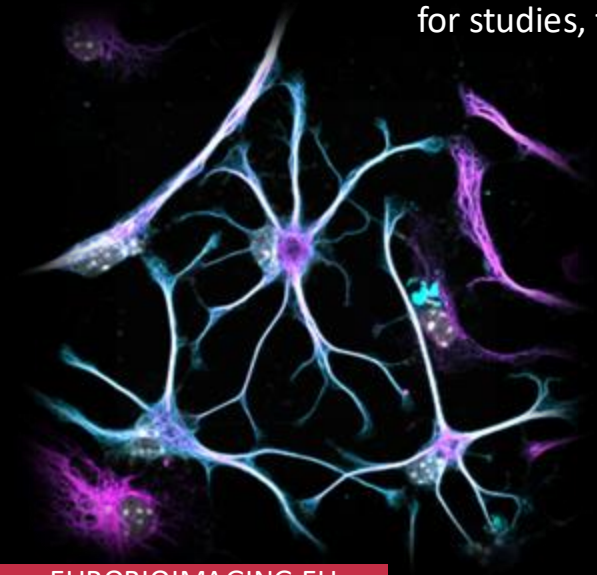
Åbo Akademi and Novia University of Applied Sciences jointly develop technologies and sensors for autonomous vessels.

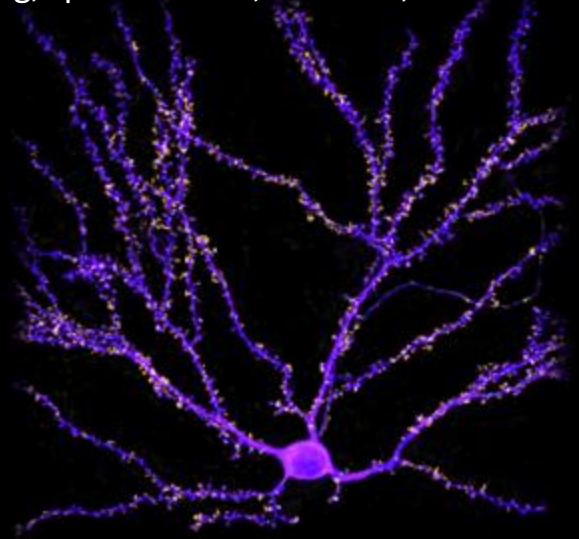
Attempts to collect information from different sensors are already being carried out on Runsala's water bus in Turku and Sveaborg. In the future, vessels could run autonomously based solely on sensor data.

The Global Gateway to the Best European Centers in BIOLOGICAL AND BIOMEDICAL IMAGING

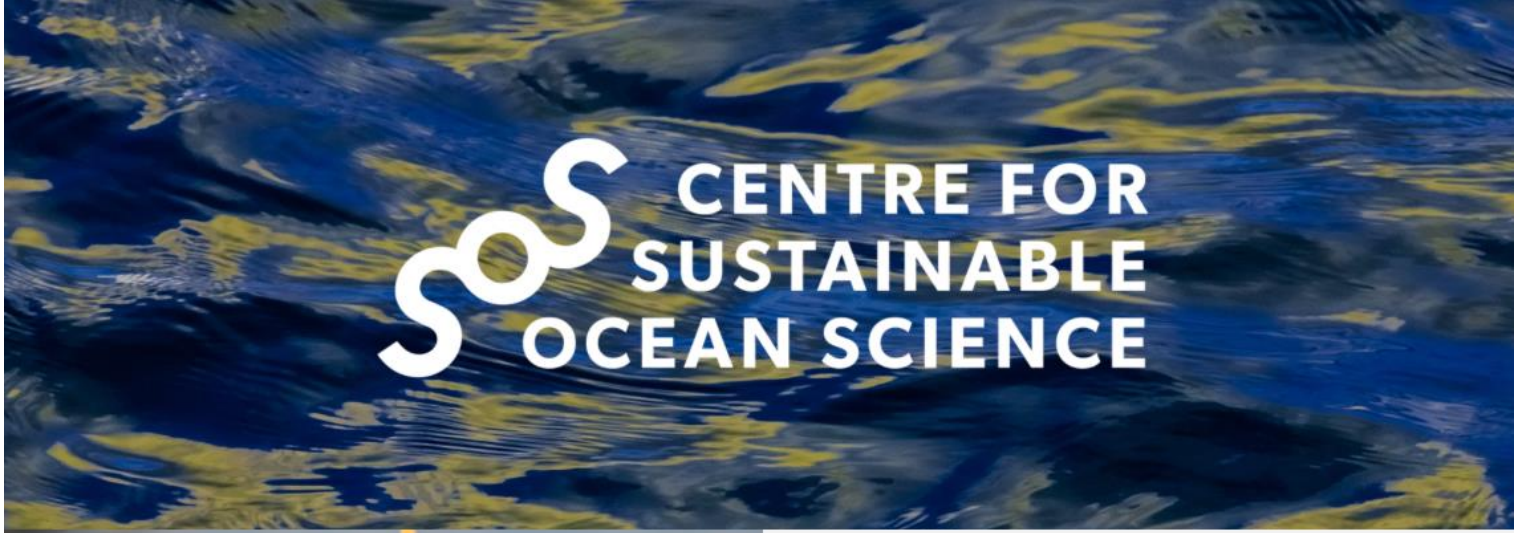
EURO BIOIMAGING
Image life, discover the future

- A pan-European research infrastructure of 21 service centers, 15 European countries and EMBL
- Åbo Akademi University, together with Universities of Oulu, Helsinki and Turku, hosts one of the service centers, the Finnish Euro-BioImaging Node
- Statutory seat and Headquarter in Turku since 2021
- Unique imaging excellence in here in Turku provide ample opportunities for studies, training, specialization, research, and career development





EUROBIOIMAGING.EU
EUROBIOIMAGING.FI



Åbo Akademi

What we do

Our mission is to provide transdisciplinary knowledge on wicked problems linked to marine biodiversity and its role in the societal transition to sustainability. Focusing on the Archipelago Sea and Åland Island area in Finland, we study how human actions interact with marine biodiversity in creating wicked problems, and what can be done to solve such challenges. We are an Åbo Akademi University Centre of Excellence funded by the Åbo Akademi University Foundation during 2024–2028.

Centre of Excellence in Materials-driven Solutions for Combatting Antimicrobial Resistance (MADNESS)

Åbo Akademi

What we do

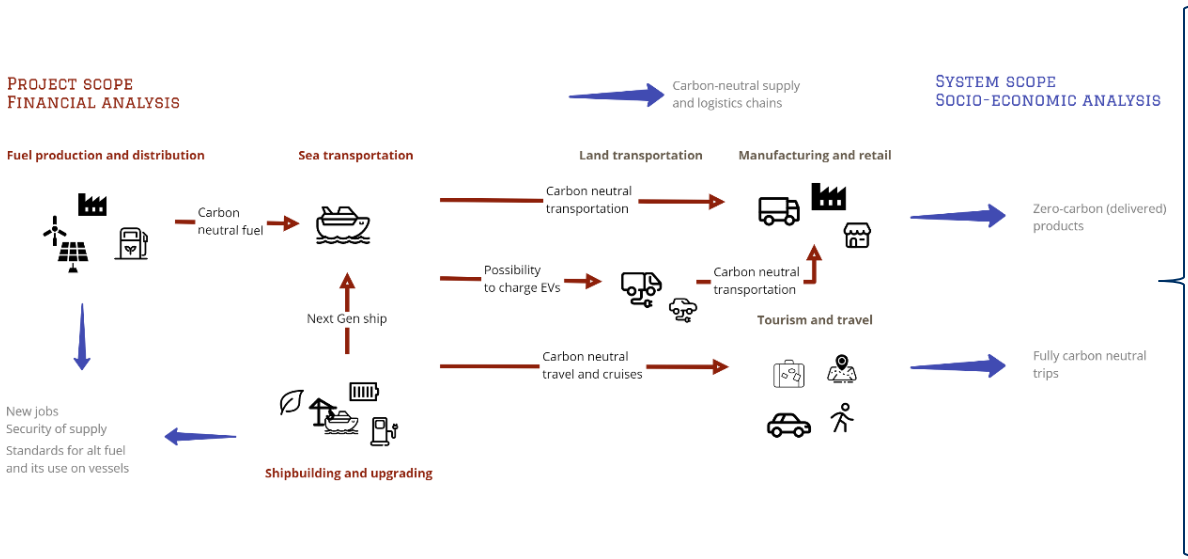
With antibiotic resistance on the rise and new drugs failing to meet the challenge, our mission is to combat antimicrobial resistance (AMR) and biofilms by pioneering advanced material-based treatment strategies against infectious diseases.

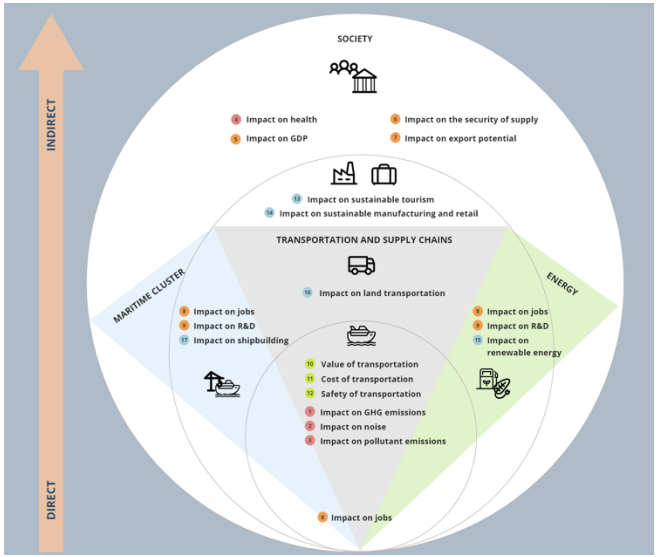
We leverage tailored nanoparticles as delivery systems for antimicrobial therapies, and extend our solutions to wound healing and tissue regeneration.

DECATRIP (Decarbonizing Transport Corridors)

Åbo Akademi University

Assessing the economic impact and barriers for fully carbon-neutral freight and passenger travel between Turku and Stockholm





Partners: RMC, Kempower, Viking Line, PBI and ÅA

Data Analytics for Zero Emission

Åbo Akademi University

Inputs

AIS
External data


System designs


Sensor data

Algorithms, modelling

Cloud level

Physics modelling

Machine Learning

Data analytics

Integrations

Adaptation and transfer of functionality and data

Physical modelling & Data fusion

Virtual data sets

Far edge, IoT

Edge level

Visualizers

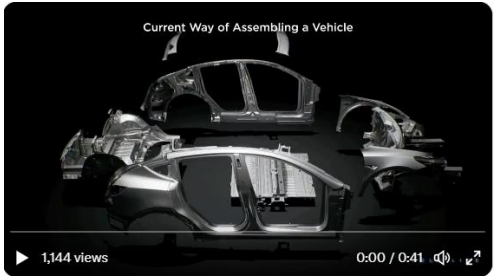
Outputs

- Model-based CBM
- Real-world evidence for retrofit / LCA
- Virtual thrust
- Service power models
- Optimizers
- Decision making

DAZE

FUSE – Future Shortsea Electric

- Part of Wärtsilä Zero Emission Maritime (ZEM) veturi
- Partners:
  - RMC (lead), Viking Line, Carina4, Aalto and ÅA
  - In kind partners Wärtsilä, DNV, Port of Helsinki, Fortum, Helen
- Aim of project: conceptual study of fully electric RoPax
  - Impact on ship structure
  - Battery and ship lifecycle
  - Impact on shipbuilding
  - Digital ship lifecycle twin
- ÅA role
  - Digital ship software twin
  - Techno-economic assessment of impact of electric RoPax and platform delivery model

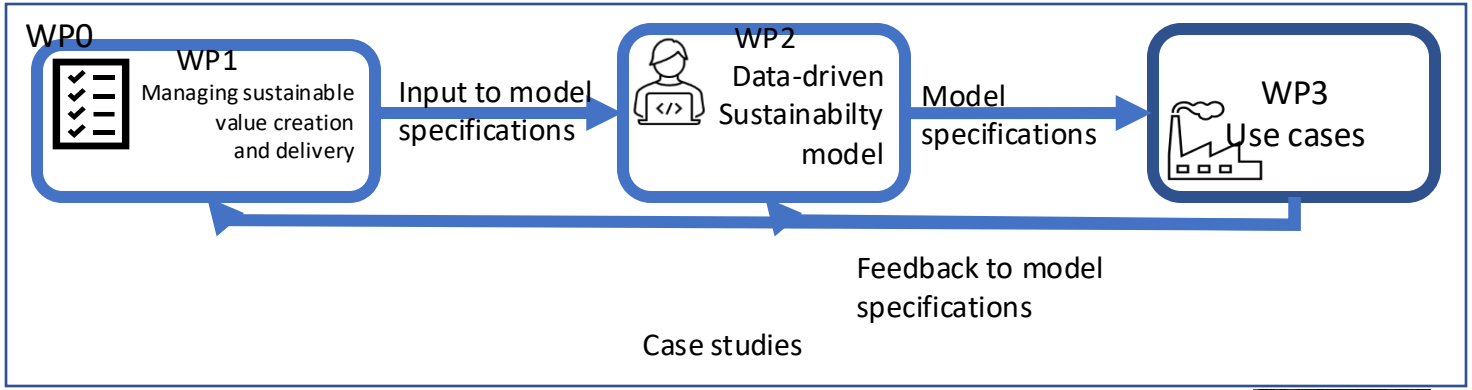


Virtual Sea Trial

- The objective of this project is to develop a unified, distributed test environment for virtual sea trials and commissioning for the whole shipbuilding ecosystem.
- Through virtualization, maritime technology providers and shipyards can demonstrate to customers new efficient ways of designing, building, and testing onboard systems; the risk associated with installing novel technological innovations onboard is reduced.
- Partners: Novia, Åbo Akademi, University of Turku, Meyer Turku, Wärtsilä, Valmet Technologies, Cadmatic

DDSM: Data driven sustainability management

Ongoing



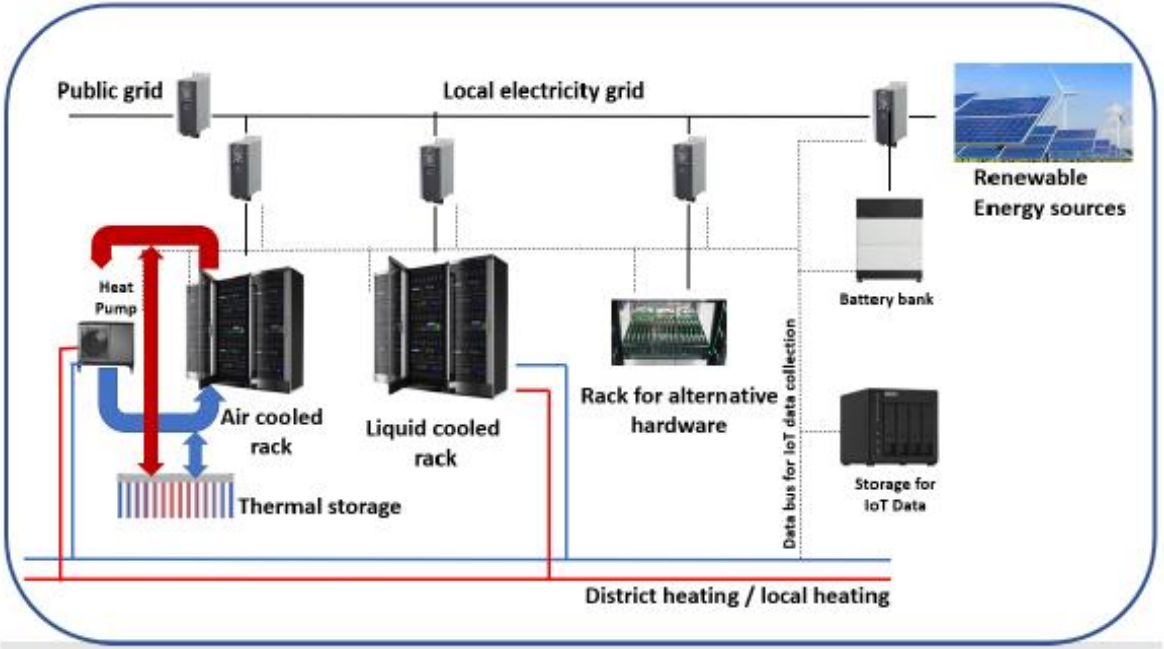
- Saalasti – Biolan
  - Proof of Concept for data gathering of energy consumption and spare part wear
- Mirka – Baltic
  - Proof of Concept for Baltic overall evaluation and Mirka Health Index
- Herrmans factory
  - Proof of Concept for Herrmans sustainability score

WSTAR
WASA ZERO EMISSION DATA CENTRE

Wasa Zero Emission Datacenter

Ongoing

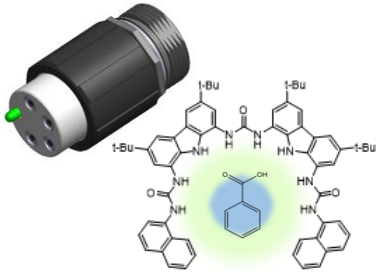
- Research Council of Finland - FIRI infrastructure



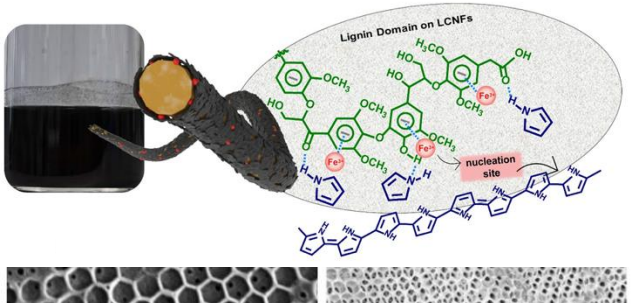
Fimpec
ABB
Danfoss
Granlund
Hitachi Energy
tietoevry
VASA ELEKTRISKA
Wapice
VAASA.
WÄRTSILÄ

Analytical Chemistry Research

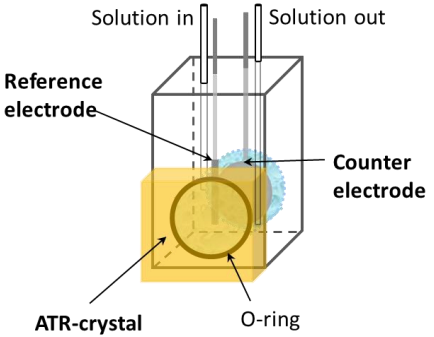
Chemical sensors



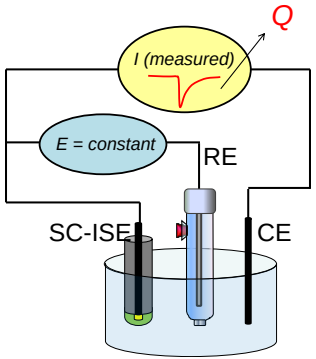
Conducting polymers, graphene and nanocellulose



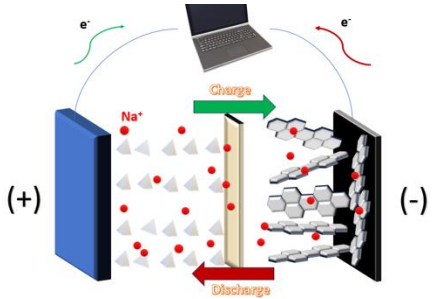
Spectroelectrochemistry



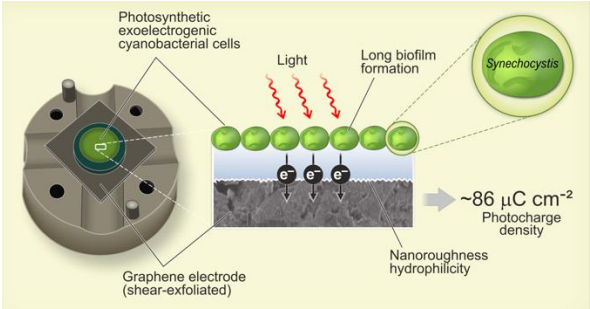
Electrochemistry



Sodium-ion batteries



Biophotovoltaics



Inorganic materials and high-temperature processes

Åbo Akademi University

Bioenergy

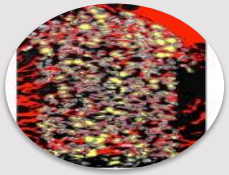
- Biomass and waste, challenging fuels
- Thermal conversion: pyrolysis, gasification, combustion
- Emissions
- Ash-related challenges
- Boiler material HT chemical and mechanical behaviour
- Thermodynamic, kinetic and CFD-modelling
- Full-scale measurements

Circular economy

- Carbon-neutral metal melting, biochar, interactions with impurities
- Metals from EEE
- Recovery of metals and other valuable elements from ashes, sludges, waste and EoL batteries
- Ceramic and glass demolition waste

Ceramics and glasses

- Composition and property optimisation of whiteware ceramics, domestic glass, flat glass, insulation glass
- Cement & geopolymers
- Property-composition relationships, including properties of interest for the manufacture and utilisation of materials



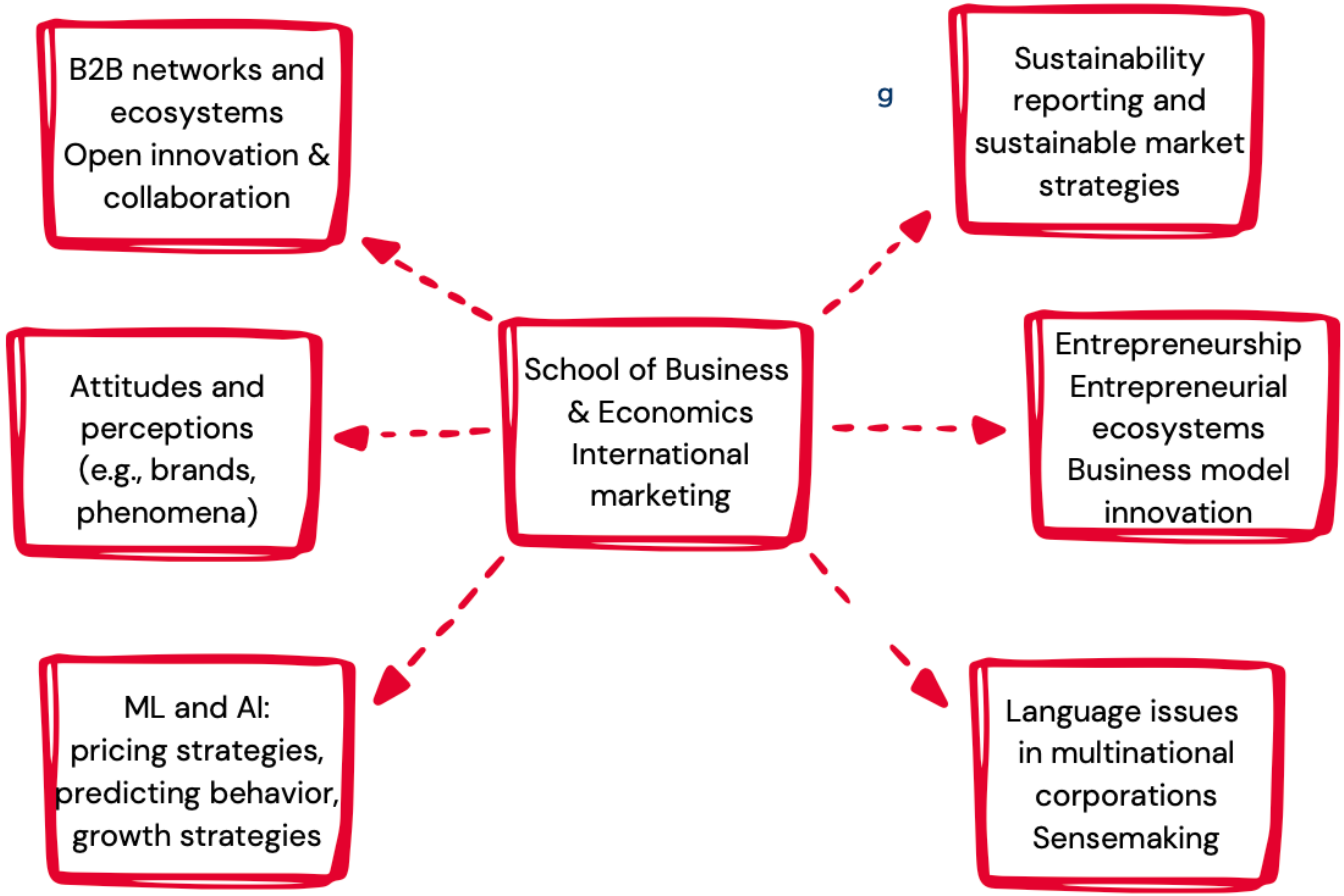
Biomedical materials

- Bioactive glasses
- Bioactive glass - biopolymer composites
- Metal implants and coatings
- Tissue engineering scaffolds
- Composition-property optimisation, with the focus on the behaviour in the dynamic body environment

Sustainable industrial processes with the focus on detailed chemistry

School of Business & Economics

Åbo Akademi



pharmAInteraction

Åbo Akademi

The PharmAInteraction project aims to contribute interdisciplinary knowledge on whether social robots can prevent and support patient safety by providing drug information, education and advice (e.g. providing advice and knowledge regarding drugs, drug interactions, possible side effects and contraindications) in pharmacies. Given the shortage of workers in pharmacies, the project also aims to investigate whether and how social robots can be a resource for promoting healthy working environments and conditions for employees. The goal is to map the needs and attitudes of relevant people by developing an innovative language model for social robots, specifically focused on drug advice in pharmacies.

Yhteistyömahdollisuudet

- Rekrytapahtumat, luentovierailut, kurssiprojektit
- Kesäharjoittelu (! also international students !)
- Diplomityö/Gradu yhteistyössä yrityksen kanssa
- Tutkimushankkeet / Analyysipalvelut
- Jatkuva oppiminen

Åbo Akademi

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