

Aalto University

Matti Hämäläinen

**Department of
Neuroscience and
Biomedical Engineering**

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Aalto-yliopisto
Aalto-universitetet
Aalto University



Aalto University

Shaping a
sustainable future

A”

Aalto-yliopisto
Aalto-universitetet
Aalto University



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

Six schools

School of Arts, Design and Architecture

architecture, art and media, design, film

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-yliopisto
Aalto-universitetet
Aalto University



12 600

full-time students

A staff of about **4 000**,
of which nearly **400** are
professors. Share of
international academic
faculty is **47%**.

Our diverse community in numbers

Each year our students earn about
200 doctoral degrees,
1 800 master's degrees,
1 500 bachelor's degrees and
300 MBA and EMBA certificates.

Aalto Otaniemi Campus and collaborators

Meilahti Health Campus

University of Helsinki

Maria 01 Startups

Ruoholahti Business District

Aalto University

Keilaniemi Business Park

Collaboration hub

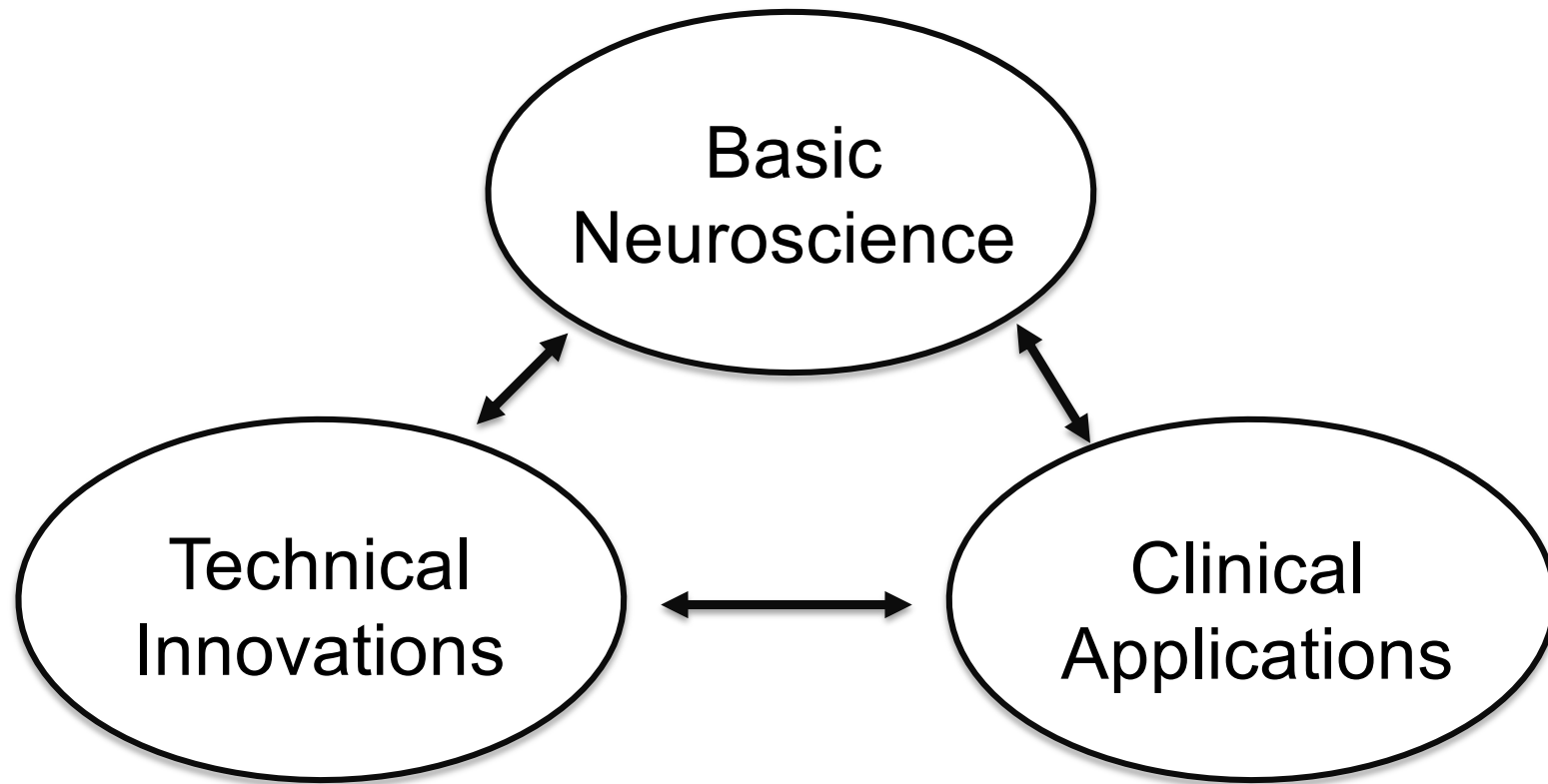
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Aalto University

Department of Neuroscience and Biomedical Engineering



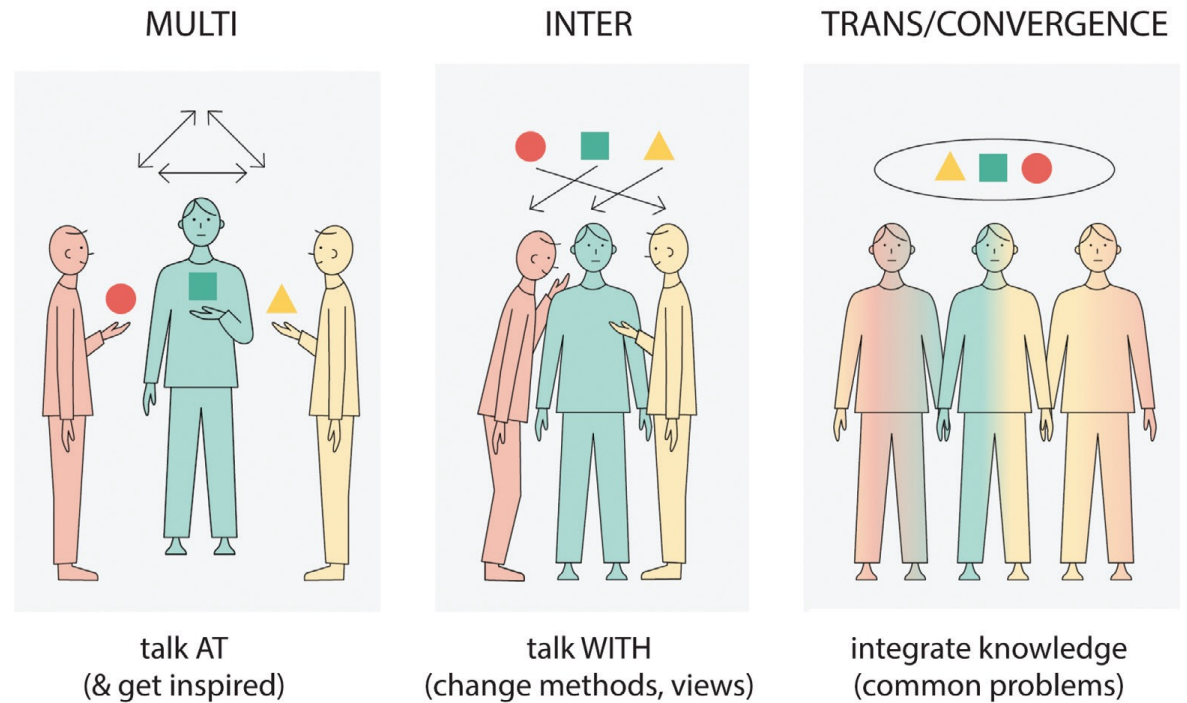
Aalto University
School of Science

Why NBE?



Multidisciplinary research at NBE

- **Contribute**
- **Appreciate**
- **Engage**
- **Abolish the boundaries**



Groth et al., 2022 ; Hari et al., 2021

NBE: Research

Group	Leaders
Ala-Laurila lab	Petri Ala-Laurila
Attention and memory	Synnöve Carlson
Bioelectromagnetism	Matti Stenroos
Brain and Mind Laboratory	Iiro Jääskeläinen
Cellular Biophysics	Ari Koskelainen
CliniMEG	Nina Forss
Empathy Building Neuro-lab	Jonathan Levy
Engineered nanosystems	Jani Oksanen Jukka Tulkki
Imaging Language	Riitta Salmelin
Medical Ultrasonics Laboratory (MEDUSA)	Heikki Nieminen
Medical Image Computing group	Koen van Leemput

Group	Leaders
MEG-MRI Brain Imaging	Koos Zevenhoven Risto Ilmoniemi
Molecular Nanoengineering	Anton Kuzyk
Neuroimaging Methods (NIMEG)	Lauri Parkkonen Matti Hämäläinen
Near-Infrared Spectroscopy and Imaging (NIRS)	Ilkka Nissilä
Palva lab	Matias Palva
Renvall lab	Hanna Renvall
Sensorimotor systems (MOTOR)	Harri Piitulainen
Transcranial Magnetic Stimulation (TMS)	Risto Ilmoniemi
Translation Cognitive Neuroscience Lab	Juha Salmitaival



Aalto NeuroImaging (ANI)

*open-access research infrastructure
for human functional neuroimaging*



A! Aalto NeuroImaging
Aalto University School of Science

Magnetoencephalography (MEG) Core

Advanced Magnetic Imaging (AMI) Centre (3T MRI)

Aalto Behavioral Laboratory (ABL)

Neuroimaging Methods (NIMEG)

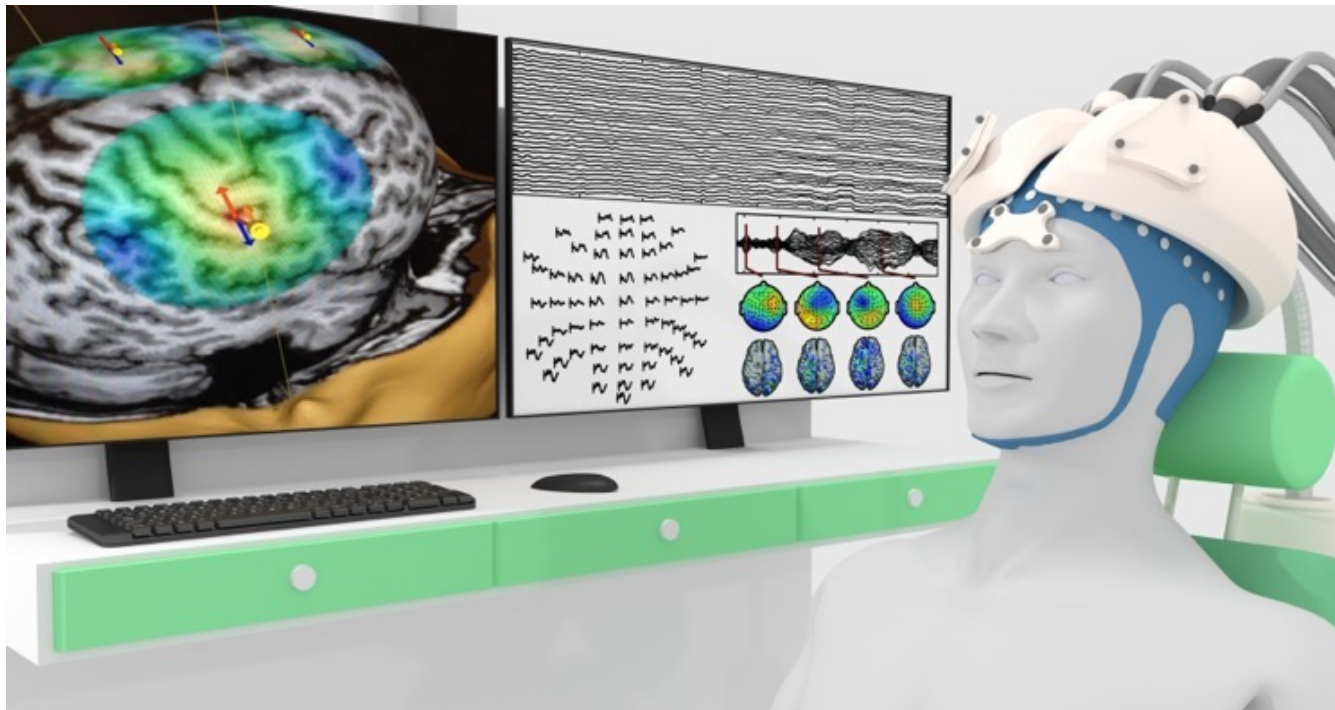
- Novel **instrumentation** for neuroimaging – current focus on high-resolution magnetoencephalography (grants from ERC, NIH and EU Quantum Flagship)
- **Analysis methods** for neuroimaging data (AoF grants)
- Basic **neuroscientific research** as well as **clinical applications** in collaboration with Helsinki Univ. Hospital (Neurocenter Finland grant)



Lauri Parkkonen

Transcranial magnetic stimulation (TMS)

Multi-locus TMS controlled in closed loop by real-time feedback from EEG (ConnectToBrain ERC Synergy Grant)



Risto Ilmoniemi 1.9.2023
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NBE: Teaching

Bachelor's degree programmes

At the Bachelor's level education, NBE contributes to the majors Engineering Physics and Bioinformation Technology.

We also supervise Bachelor theses.

Master's degree programme

At the Master's level education, NBE produces two majors for the Master's Degree Programme in Life Science Technologies:

1. Biomedical Engineering
2. Human Neuroscience and Technology



NBE: Doctoral Studies

Many graduate students of the **Aalto SCI Doctoral Programme** conduct their thesis work in the research groups of our department.

Doctoral programme Brain & Mind is a multidisciplinary PhD training network that connects neuroscience research groups at the University of Helsinki and Aalto University.



Thank you!

nbe.aalto.fi



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