



ABC Symposium

Disrupting Neuroscience And Neurology With Neurotechnology



Speakers:

Gerben Meynen
Utrecht University

Michael Hausser
University College London

Patricija Bugar
Phosphoerix

Kambiz Nanbakhsh
Salvia Bioelectronics

Researchers from the INTENSE Consortium
Innovative Neurotechnology for Society

Boudewijn Lelieveldt
Leiden University

Anneke Alkemade
University of Amsterdam

Stéphanie Lacour (Frijda lecture)
Swiss Federal Institute of Technology in Lausanne

26 June 2025

9:00-18:00

UvA Amsterdam Roeterseiland Campus Room: M1.01.
Plantage Muidersgracht 12, 1018 TV Amsterdam

Registration via



Closing symposium programme June 26th 2025

Time	Topic	Lecturer
09.00-09.30	Registration and coffee at REC hall M building	
09:30-09:40	Welcome in room REC M1.01	
09:40-10:25	Mixed methodology in brain imaging	dr. Anneke Alkemade (University of Amsterdam)
10:25-11:10	How to standardize a brain: data visualization for the Human and Mammalian Brain Atlas project.	prof. dr. Boudewijn Lelieveldt (Leiden University)
11:10-11:30	Coffee Break in hall REC M	
11:30-12:10	<i>Entrepreneur session: from academia to the companies.</i> Inside a Neurotech Startup: Developing a Brain Implant for Restoring Vision	Patricija Burgar of Phosphoenix and
	<i>From Lab to Body: Long-Term Design Strategies for Small Bioelectronic Implants</i>	Kambiz Nanbakhsh of Salvia Bioelectronics
12:10-12:55	Dutch Neurotechnology: <u>INTENSE</u> crossover session with researchers from the INTENSE Consortium	Maureen van der Grinten VR simulator of the visual prosthesis Emily Mo Nipshagen Decoding moving signals from the motor cortex/AI for paralysis
13:00-14:30	Students poster session + lunch	In hall REC M

14:30-15:15	Do we need neurorights?	prof. dr. Gerben Meynen (Utrecht University)
15:15-16:00	Illuminating causal links between neural circuit activity and behaviour	prof. dr. Michael Hausser (University College London)
16:00-16:20	Coffee break in hall REC M	
16:20-17:20	Honorary Frijda Lecture: Advances in Implantable Neurotech for Brain, Spinal Cord, and Peripheral Nerve Interfaces	prof. dr. Stéphanie Lacour (Swiss Federal Institute of Technology in Lausanne)
17:20	Closing + poster award	
17:30	Networking event including drinks	In hall REC M

Overview of speakers ABC Symposium 2025

Anneke Alkemade

University of Amsterdam, NL

Mixed methodology in brain imaging

Histological and magnetic resonance imaging (MRI) research both provide information on the functional neuroanatomy of the human brain. Microscopy research provides an unmatched level of anatomical detail but is usually limited by low numbers of observations. MRI research does not provide the same level of detail but provides us with insight in interindividual variation through larger numbers of observations. Novel approaches allow us to bridge between imaging modalities. The resulting brain models provide us with the best of both worlds, and can be applied to create advanced atlasing tools for application in neuroimaging research and clinical applications.

Boudewijn Lelieveldt

Leiden University, NL

How to standardize a brain: data visualization for the Human and Mammalian Brain Atlas project.

The US Brain Initiative (BI) was launched in 2013 initially to develop novel technology to see the (human) brain in action with single cell resolution. Currently in its third phase, the NIH started in 2022 the BI Cell Atlas Network (BICAN) to provide a standardized whole-brain single cell transcriptomic atlas for the marmoset, macaque and human brain: The Human and Mammalian Brain Atlas project (HMBA). In this presentation, an overview of the HMBA project will be given, with specific focus on our contribution in this project: we develop freely available data visualization and analysis software that helps the user explore and gain insight in these exascale omics datasets. The talk includes live software demo's of Cytosplore Viewer, which enables users to visualize and compare several HMBA single-cell and spatial transcriptomics datasets, and SpaceWalker, which enables interactive exploration of gene expression gradients in whole-brain spatial transcriptomics data. Examples will be given of how these datasets can be deployed for computational hypothesis generation and for the design of subsequent wet-lab validation experiments.

Patricija Burgar

Phosphoenix, NL

What does it take to develop a high-electrode-count brain implant, and what's it like to do so in a neurotech startup?

In this talk, I'll share an inside look at our effort to restore vision through a visual neuroprosthesis, why I joined the company, and what my role involves. I'll highlight the interdisciplinary nature of bringing such a device to market, from technical challenges to regulatory paths, along with recent milestones, future goals, and what day-to-day life looks like in a small, fast-moving neurotech team.

Kambiz Nanbakhsh

Salvia Bioelectronics, NL

From Lab to Body: Long-Term Design Strategies for Small Bioelectronic Implants

Small bioelectronic implants hold great promise for treating neurological disorders, but their long-term success depends on reliable packaging. This talk presents some strategies for realizing miniaturized implantable devices using novel packaging technologies that balance flexibility, durability, and long-term biostability. By bridging materials science, reliability testing, and biomedical engineering, it is explained how lab-scale innovations can be translated into robust, long-lasting devices for the human body.

Gerben Meynen

Utrecht University, NL

Do we need neurorights?

In light of recent advancements in neurotechnology, concerns have been raised that our minds and brains may not be sufficiently protected against these technologies by our human rights frameworks, such as the European Convention on Human Rights. Some ethicists and lawyers have already concluded that these frameworks fall short in protecting us against technologies that may obtain information from our brains or modify neural activity and have called for new 'neurorights'. These new human rights should, for instance, specifically protect our mental integrity and psychological continuity. In this presentation I will discuss some central ethical and legal worries about disruptive neurotechnologies and the alleged need for 'neurorights' — with some emphasis on possible future criminal justice applications.

Michael Hausser

University College London, UK

Illuminating causal links between neural circuit activity and behaviour

Understanding the causal relationship between activity patterns in neural circuits and behavior is one of the fundamental questions in systems neuroscience. Addressing this problem requires the ability to perform rapid and targeted interventions in ongoing neuronal activity at cellular resolution and with millisecond precision. I will describe results of experiments using a powerful “all-optical” strategy for interrogating neural circuits which combines simultaneous two-photon imaging and two-photon optogenetics. This enables the activity of functionally characterized and genetically defined ensembles of neurons to be manipulated with sufficient temporal and spatial resolution to enable physiological patterns of network activity to be reproduced. We have used this approach to identify the lower bound for perception of cortical activity, probe how brain state influences the role of cortex in perception, and provide causal tests of the role of hippocampal place cells in spatial navigation.

Stéphanie Lacour

Swiss Federal Institute of Technology in Lausanne, SW

Advances in Implantable Neurotech for Brain, Spinal Cord, and Peripheral Nerve Interfaces

Implantable neurotechnology is transforming neuroscience and neurology by providing precise, biocompatible interfaces that seamlessly integrate with the nervous system. This talk will explore recent advancements in soft and adaptive neural implants, focusing on applications in brain, spinal cord, and peripheral nerve interfaces for restoring function and alleviating neurological disorders. In the brain, high-density microelectrode arrays and soft neural interfaces enable stable, high-resolution recordings and stimulation for applications such as epilepsy monitoring and neuromodulation therapies. In the spinal cord, flexible electrode arrays are advancing neuromodulation strategies for motor recovery, while in the peripheral nervous system, innovations such as optocuffs help to decipher pain circuitry and offer targeted, minimally invasive alternatives to electrical stimulation. A key challenge in neurotechnology is achieving long-term stability and functionality in dynamic biological environments. Our work addresses this by developing stretchable, self-adapting, and minimally invasive neuroelectronic systems that can conform to complex anatomical structures while maintaining robust signal fidelity and durability. By bridging the gap between fundamental neuroscience, clinical translation, and neuroengineering, these technologies are redefining how we interface with the nervous system. In this lecture, I will share insights from my

lab research, discuss key translational challenges, and explore the future directions of next-generation implantable neurotechnology.

Who we are

The ABC Summer School 2025 is organized by dr. Umberto Olcese (SILS, University of Amsterdam), prof. dr. Birte Forstmann (Brain & Cognition, University of Amsterdam), dr. Anneke Alkemade (Brain & Cognition, University of Amsterdam), Prof. dr. Wouter Sedijn (Bioelectronics, Delft University of Technology), and dr. Vasiliki Giagka (Bioelectronics, Delft University of Technology)

The ABC Summer is supported by both the Institute of Interdisciplinary Studies (IIS) and the Amsterdam Brain and Cognition Centre (ABC).

Institute of Interdisciplinary Studies (IIS)

The *Institute for Interdisciplinary Studies* (IIS) is the UvA's knowledge centre for interdisciplinary learning and teaching. It develops new courses in collaboration with the faculties. The IIS has more than 20 years' experience in interdisciplinary education and continuously develops substantive education innovations with an interdisciplinary character. The institute identifies new themes and issues linked to current developments in academia and society.

Amsterdam Brain and Cognition (ABC)

The *Amsterdam Brain and Cognition* Centre (ABC) is an interdisciplinary centre that fulfils a number of functions within the University of Amsterdam. It serves as a

platform and community for cognitive scientists interested in a wide range of Cognitive Science topics, ranging from perception to memory, decision-making, language and logic. ABC supports interdisciplinary research, symposia, expert meetings and organizes an annual lecture series and the ABC Summer School.

dr. Umberto Olcese

(SILS, University of Amsterdam)

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