

ZNZ Annual Symposium 2026

Thursday, 10 September 2026

ETH Zurich Main Building, Lecture Hall F7, Rämistrasse 101, 8092 Zurich

08:30 – 08:45	Introduction Prof. Fritjof Helmchen, Director ZNZ
08:45 – 09:30	Volker Henn Lecture Controlling the controller: Dopaminergic influences over Pavlovian and instrumental interactions Prof. Peter Dayan, Max Planck Institute for Biological Cybernetics, Tübingen
09:30 – 10:15	Coffee Break
10:15 – 11:45	Parallel Workshops
	Pain mechanisms along the nociceptive neuraxis Lecture Hall F7, Organization: Prof. Michèle Hubli
	Neurofluid transport and brain health: From mechanisms and technological innovation to clinical applications Lecture Hall F5, Organization: Prof. Ruth Tuura
	Bridging from natural to artificial intelligence Lecture Hall F3, Organization: Prof. Giacomo Indiveri
11:45 – 14:15 12:00	Poster Session (E-Main Hall), Lunch at 12:45 (Foyer EO Süd) General Assembly of ZNZ group leaders (Lecture Hall F7)
	Short Talks of New Members
14:15 – 14:35	The role of mitochondrial remodeling for neuronal differentiation and function Prof. Tatjana Kleele, Institute of Biochemistry, ETH Zurich
14:35 – 14:55	The hungry brain: The science of need, choice and behavior Prof. Christin Kosse, Institute of Molecular Health Sciences, ETH Zurich
14:55 – 15:15	Through the pupil: Arousal regulation across wake and sleep Prof. Sarah Meissner, Brain-Body Regulation Laboratory, ETH Zurich
15:15 – 15:35	Imaging the lumbosacral spinal cord: MRI methods and applications in spinal cord injury Dr. Gergely David, Spinal Cord Injury Center, Balgrist University Hospital
15:35 – 15:50	ZNZ Award for the Best PhD Thesis 2026 and Best Poster Prizes
15:50 – 16:30	Coffee Break
16:30 – 17:15	Plenary Lecture The mitochondrial logic of stress vulnerability and resilience Prof. Carmen Sandi, Laboratory of Behavioral Genetics, EPFL
17:15 – 18:00	Apéro

Parallel Workshops, 10:15 – 11:45

Pain mechanisms along the nociceptive neuraxis

(Lecture Hall F7)

Acute pain is a physiological and adaptive response that serves a protective biological function, whereas chronic pain represents a pathological condition characterized by persistent maladaptive neural processing. Chronic pain arises through complex mechanisms involving both peripheral and central nervous system alterations across the neuraxis. This workshop will highlight current research on the mechanistic basis of chronic pain in both human and animal studies. Topics will include peripheral mechanisms such as neuroimmune interactions and nociceptor sensitization, as well as central mechanisms including central sensitization, maladaptive brain reorganization, and other neurobiological adaptations associated with pain chronification. In addition, the workshop will address mechanistic differences across diverse chronic pain cohorts to provide an integrated perspective on chronic pain pathophysiology.

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| 10:15 – 10:20 | Welcome and introduction to pain research and speakers
Prof. Michèle Hubli, Spinal Cord Injury Center, Balgrist University Hospital and UZH |
| 10:20 – 11:00 | Neuro-immune interactions in human neuropathic pain
Prof. Annina Schmid, Nuffield Department of Clinical Neurosciences, University of Oxford |
| 11:00 – 11:15 | Spinal pain mechanisms - descending and local pain control
Dr. Robert Ganley, Institute of Pharmacology and Toxicology, UZH |
| 11:15 – 11:30 | Stable maps, shifting narratives: revisiting S1 body map reorganization in chronic (low back) pain
PD Dr. Michael Meier, Integrative Spinal Research Group, Balgrist University Hospital |
| 11:30 – 11:45 | Pathomechanisms of neuropathic pain after spinal cord injury: Insight from pain-autonomic interaction
Joëlle Metzger, Spinal Cord Injury Center, Balgrist University Hospital and UZH |

Parallel Workshops, 10:15 – 11:45

Neurofluid transport and brain health: From mechanisms and technological innovation to clinical applications (Lecture Hall F5)

Recent research has highlighted the importance of neurofluid transport in maintaining brain health across the lifespan, yet the mechanisms governing fluid transport and clearance within and around the brain remain incompletely understood. At the same time, new imaging and monitoring technologies are rapidly advancing, providing unprecedented opportunities to study neurofluid dynamics in vivo.

This workshop brings together experts from neuroimaging, physiology, fluid dynamics, and lymphatic surgery to explore emerging insights into neurofluid transport. Presentations will examine innovative noninvasive approaches for imaging brain clearance pathways and monitoring intracranial volume composition, as well as clinical applications of neurofluid research in the context of deep cervical lymphatic surgery. By integrating advances in technology development with mechanistic and translational research, the session will highlight current challenges and emerging opportunities in the field and advance our understanding of the role of neurofluid dynamics in brain health and disease.

10:15 – 10:20	Introduction Prof. Ruth Tuura, Center for MR Research, University Children's Hospital
10:20 – 10:55	Noninvasive brain clearance imaging Prof. Matthias van Osch, Department of Radiology, Leiden University Medical Center
10:55 – 11:20	Noninvasive continuous monitoring of intracranial volume composition Prof. Vartan Kurtcuoglu, Department of Physiology, UZH
11:20 – 11:45	Cleansing the mind - exploring deep cervical lymphatic surgery for neurological restoration Prof. Nicole Lindenblatt, Department of Plastic Surgery and Hand Surgery, USZ

Parallel Workshops, 10:15 – 11:45

Bridging from natural to artificial intelligence

(Lecture Hall F3)

Despite the immense success of modern artificial intelligence, conventional computing systems cannot match biological neural processing systems in many closed-loop real-time sensory processing tasks and consume orders of magnitude more power than biological brains.

To bridge this profound efficiency and performance gap, researchers must look beyond traditional computing paradigms and draw inspiration directly from the brain's computational primitives. Exploring these cutting-edge intersections, this workshop will gather experts to discuss how biological principles can shape the future of NeuroAI.

The symposium features a keynote talk on neural architectures and local learning mechanisms, detailing the essential components needed to realize bio-inspired computing systems. This foundational overview will be followed by rapid research spotlights from outstanding postdocs covering advanced topics such as predictive coding, cortico-hippocampal planning, and bio-inspired neuromorphic computing, ultimately culminating in a dynamic open panel debate on the future of biologically grounded AI.

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| 10:15 – 10:20 | Introduction and opening remarks
Prof. Giacomo Indiveri, Institute of Neuroinformatics, UZH & ETH Zurich |
| 10:20 – 10:50 | Neural architectures and local learning mechanisms
Prof. Elisabetta Chicca, Zernike Inst. for Advanced Materials University of Groningen |
| 10:50 – 11:00 | Distributed inference: Predictive coding beyond the hierarchy
Dr. Nicole Dumont, Institute of Neuroinformatics, UZH & ETH Zurich |
| 11:00 – 11:10 | Long-horizon planning with multi-scale hierarchies of cortico-hippocampal circuits
Dr. Adrian Fernandez Amil, Institute of Neuroinformatics, UZH & ETH Zurich |
| 11:10 – 11:20 | Three levels of biological inspiration for neuromorphic computing and neuro-AI
Dr. Filippo Moro, Institute of Neuroinformatics, UZH & ETH Zurich |
| 11:20 – 11:30 | The geometry of identity: How the brain represents individuals
Dr. Margherita Giamundo, Institute of Neuroinformatics, UZH & ETH Zurich |
| 11:30 – 11:45 | Panel discussion & open debate
Joint Q&A and interactive discussion with all speakers |