NEUROMORPHIC TECHNOLOGY: A GIANT LEAP FOR AI
An AI UK Fringe Event, 26-28 March 2024

DAY 1: Tuesday 26th March

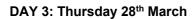|		
9:00 - 9:10	Welcome	Professor Tim Watson (Turing Institute and Loughborough University)
9:10 - 9:25	Introduction	Professor Sergey Saveliev, AI and Cognitive Technologies (Loughborough University)
9:25 - 9:35	AI motivated Research at the Department of Physics at Loughborough	Dr Alexander Balanov (Loughborough University)
9:35 - 10:05	Quantum Reservoir Computing, Research and New EU projects	Dr Alexandre Zagoskin (Loughborough University)
10:05 - 10:35	Practical Functional Oxides for Neuromorphic Devices	Professor Judith L. MacManus-Driscoll (University of Cambridge)
10:35 - 11:05	Fragility, Robustness and Antifragility in Deep Learning	Dr Varun Ojha (Newcastle University)
11:05 - 14:00	**Break**	
14:00 - 14:30	Materials challenges for memristive technologies	Professor Tony Kenyon (University College London)
14:30 - 15:00	Quantum Reservoir Computing Implementations for Classical and Quantum Problems	Professor Marian Florescu (University of Surrey)
15:00 - 15:30	The truth gauges for neuromorphic computation: correctors of errors with provable performance bounds and deferral option	Professor Ivan Tyukin (King's College London)
15:30 - 16:00	**Break**	
16:00 - 16:30	Spiking neurons based on diffusive memristors	Professor Sergey Saveliev (Loughborough University)
16:30 - 17:00	Analog computing with high precision and programmability enabled by memristors	Professor Joshua Yang (University of Southern California)

DAY 2: Wednesday 27th March

9:00 - 9:30	Machine Learning Techniques Applied to Quantum Physics	Professor Franco Nori (RIKEN and University of Michigan)
9:30 - 10:00	Photonic Spiking Neurons and Neural Networks for ultrafast light-enabled Neuromorphic Technologies	Dr Antonio Hurtado (University of Strathclyde)
10:00 - 10:30	Novel and Neuromorphic Computing for Defence	Keith Hermiston (Dstl)
10:30 - 11:00	Complexity-Driven Neuromorphic Photonics	Dr Juan Sebastian Totero Gongora (Emergent Photonics Research Centre, Loughborough University)
11:00 - 11:30	**Break**	
11:30 - 12:00	Design of multistable solutions in memristors	Professor Ronald Tetzlaff (TU Dresden)
12:00-12:30	**Break**	
12:30 - 13:00	Reliable and efficient neuromorphic AI with memristors	Professor Bipin Rajendran (KCL)
13:00 - 13:30	tbc	Professor T Prodromakis, AI Hub on Electronics (Edinburgh)
13:30-14:00	**Break**	
14:00-14:30	The quantum measurement problem in the cellular environment	Professor Jim Al-Khalili (Surrey),
14:30 - 15:00	On-chip reservoir computing with a phonon-magnon blend	Dr Alexey Scherbakov (TU Dortmund)
15:00 - 15:30	Learning in Networks of Mathematically Agnostic "In Materio" Devices	Professor Eleni Vasilaki (Sheffield)
15:30 - 16:00	**Break**	
16:00 - 16:45	Nonmonotonic dynamical materials for brain-inspired computers	Professor Stanley Williams (Texas A&M)
16:45 - 17:15	Memristor-based hardware accelerators for artificial intelligence	Professor Qiangfei Xia (University of Massachusetts Amherst)

DAY 3: Thursday 28th March

9:00 - 9:30	Neuromorphic landscape review	Paul Larcey (Innovate UK)
9:30 - 10:00	OTS and MTJ based TRNG: Emerging Pathway for Neuromorphic AI	Professor Wei Zhang (Liverpool John Moores University)
10:00 - 10:30	Resistance Switching in Silicon Oxide for Memory and Computing Applications	Dr Adnan Mehonic (University College London)
10:30 - 11:00	Artificial spiking neurons made from volatile memristors	Dr Pavel Borisov (Loughborough University)
11:00 - 11:30	Memristive behaviour of functionalised graphene quantum dot and polyaniline nanocomposites	Dr Niladri Banerjee (Imperial College London)
11:30-12:00	**Break**	
12:00 - 12:30	On the clusterability of latent representations in image pipelines	Dr Alex Serb (Edinburgh)
12:30 - 13:00	Building Block Components for Neuromorphic Computing: Exploring Novel Switching Materials and Device Types	Professor Neil Kemp (Nottingham)
13:00 - 13:30	Dendritic Computation: The What, the Why and The How	Dr Daniel Mannion (Turing)
13:30 - 14:00	Mesoporous silica diffusive memristors for neuromorphic computing	Dr Ruomeng Huang (University of Southampton)
14:00 - 14:30	Neuromorphic artificial intelligence in space and beyond	Dr Dominik Dold (Advanced Concepts Team, European Space Agency)
14:30-15:00	**Break**	
15:00 - 15:30	Neuroscience without neurons	Professor Andrew Adamatzky (UWE, Bristol)
15:30 - 16:00	Dynamical systems with self-organising velocity vector field: a pathway to explainable Artificial Intelligence (AI)	Dr Natalia Janson (Loughborough University)
16:00 - 16:30	Artificial Neuron with a Quantum Memristor	Dr Alexander Balanov (Loughborough University)
16:30 - 17:00	Psychophysics of spatial computing	Dr Sergei Gepshtein (Salk Institute)
17:00 - 17:30	Energy-efficient Spiking Neural Networks	Dr. Shirin Dora

17:30 - 17:40	Closing remarks	Professor Sergey Saveliev (Loughborough University