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IET, BCS & ACM Joint Lecture

# *A Massively-Parallel Computer for Real-Time Neural Modelling*

by Steve Furber, ICL Professor of Computer  
Engineering, University of Manchester

Thursday 1st March 2007 at 7:00pm

Lecture Theatre 1, Cambridge University Computer Laboratory  
J J Thompson Avenue, Madingley Road, Cambridge

The real-time modelling of large systems of spiking neurons is computationally very demanding in terms of processing power, synaptic weight memory requirements and communication throughput. We propose to build a high-performance computer for this purpose with a multicast communications infrastructure inspired by neurobiology. The core component will be a chip multiprocessor incorporating some tens of small embedded processors, interconnected by an NoC (Network on Chip) that carries spike events between processors on the same or different chips. The design emphasizes modelling flexibility, power-efficiency, and fault-tolerance, and is intended to yield a general-purpose platform for the real-time simulation of large-scale spiking neural systems.

**Steve Furber** is ICL Professor of Computer Engineering in the School of Computer Science at the University of Manchester. He received his B.A. degree in Mathematics in 1974 and his Ph.D. in Aerodynamics in 1980 from the University of Cambridge. Working at Acorn Computers Ltd he was a principal designer of the BBC Microcomputer and the ARM 32-bit RISC microprocessor. At the University of Manchester in 1990 he established the Amulet research group which merged with the Parallel Architectures and Languages group in 2000 to form the Advanced Processor Technologies group. Steve is a Fellow of the Royal Society, the Royal Academy of Engineering, the BCS, the IET and the IEEE, and a Chartered Engineer. In 2003 he was awarded a Royal Academy of Engineering Silver Medal. In 2004 he became the holder of a Royal Society Wolfson Research Merit Award.

Refreshments at 6:30pm – All visitors welcome

<http://www.iet-cambridge.org.uk>

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