**Back to the Future: The Incoming Wave of Innovation – Lynn Conway, Univ. of Michigan**

**Abstract:** Lynn first reflects on the personal computer and VLSI revolutions, on what it felt like back then, and on the bootstrapping processes that led to the breakout. She believes history is about to repeat itself on a yet vaster scale, as we suddenly begin embedding macroscale-product-enhancing modular interconnected microsystems into almost everything. The trigger for this looming breakout: the commingling and hybridization of (i) EDA tools, (ii) digital macro/micro/nano “making” and (iii) social-media, yielding multi-technology "exploration infrastructure" for widespread user-engaged market development and rapid open-source technology evolution. By exploiting collaborative learning, crowdsourcing, crowdfunding, IP brokering, agile methods, rapid-digital-prototyping and more, all participants, from users to makers, can dramatically scale up their connectivity and rate-of-impact. Thus, even as Moore’s Law “ends”, a whole new dimension of digital architectural exploration is opening up, as individual processing/MEMS components exploit TSVs and interposers in 3-D stacks, and as novel arrays, lattices and networks of such components are interconnected via printed, woven, flexible and wireless means, for embedding in an ever-expanding array of end-uses. As the pace of innovation escalates, the time to innovate, prototype, validate and distribute will become key to surfing this wave, and thus of central concern to system architects.

**Lynn Conway** is Professor of Electrical Engineering and Computer Science Emerita at the University of Michigan. While at IBM-ACS in the 1960’s, Lynn invented ‘dynamic instruction scheduling’, a major advance in superscalar computer architecture. While at Xerox PARC in the 1970’s, Lynn invented scalable VLSI design rules, co-authored the classic text *Introduction to VLSI Systems* and pioneered the teaching of the new methods at M.I.T., launching a revolution in chip design. Lynn also invented and deployed the internet e-commerce system for rapid chip prototyping that became the "MOSIS" system, spawning the "fabless-design” and “silicon-foundry" paradigm of chip production. Currently affiliated with Michigan’s Center for Wireless Integrated MicroSensing and Systems (WIMS2), Lynn is a Fellow of the IEEE, a Fellow of the Computer History Museum, and a Member of the NAE.