cfaed Seminar Series

DATE: 1 July 2015
TIME: 16:00
LOC: TU Dresden, Seminar Room 115, Hallwachsstr. 3 (HAL)

GUEST SPEAKER: John J. Boland (School of Chemistry and Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN), Trinity College Dublin, Ireland)
TITLE: “Connectivity, memory and neuromorphic function in non-biological networks”

Abstract:
The seminar will discuss scaling and evolution of connectivity in inorganic nanowire networks when exposed to different stimuli. Network junctions control the overall properties of any network. We discuss how these junctions evolve from capacitor-like to resistor-like barriers in response to a stimulus and how the network self-selects connectivity paths by choosing the lowest barrier junctions. Continued stressing causes the selected junctions to strengthen and ultimately co-opts neighbouring junctions to reinforce the overall response to the stimulus. By engineering these junctions it is possible to control the properties and response of the network. Materials with arbitrarily controlled connectivity and conductivity are demonstrated as are device with arbitrarily controlled multi-level memory, and single junctions capable of a learning response.

Bio
Prof. Boland received his BSc degree from University College Dublin and PhD from the California Institute of Technology. He is a Professor in the School of Chemistry at Trinity College Dublin and Director of the Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN). Prof. Boland was previously a researcher at the IBM T.J. Watson Research Centre, and the J.J. Hermans Professor of Chemistry and Applied and Materials Sciences at the University of North Carolina at Chapel Hill. His current research interests involve the electrical and mechanical properties of nanoscale materials, and molecular recognition and assembly and nanoscale contact formation.