

KAVLI INSTITUTE FOR THEORETICAL PHYSICS

Presents

The Fifty-Fourth KITP Public Lecture

Sponsored by Friends of KITP

Stuart Parkin

The Spin on Electronics!

The nanoscience and nanotech of spin currents

Spintronics is a research field that is focused on the controlled manipulation of currents of the quantum-mechanical spin angular momentum of electrons in atomically engineered nanostructures. It promises entirely new classes of sensor, memory and logic devices. Magnetic recording read heads – initially formed from a “spin-valve”, and more recently using a “magnetic tunnel junction” – have enabled a 1,000-fold increase in the storage capacity of hard disk drives since 1997. The very low cost of disk drives coupled with the high performance and reliability of solid-state memories, may be combined in the *Racetrack Memory* – a novel three-dimensional technology which stores information as a series of magnetic domain walls in nanowires, manipulated by spin-polarized currents. Spintronic devices may even allow for “plastic” devices that mimic synaptic switches in the brain, which would allow for the possibility of ultra-low power computing devices.

About the Speaker

DR. STUART PARKIN is an IBM Fellow, manager of the Magnetoelectronics group at the IBM Almaden Research Center, and a Consulting Professor at Stanford University. He is also director of the IBM–Stanford Spintronic Science and Applications Center. Dr. Parkin’s research interests include oxide thin film heterostructures, high-temperature superconductors, and magnetic thin-film structures, as well as spintronic materials and devices for advanced sensor, memory, and logic applications. Among his many honors, Parkin is a Member of the National Academy of Sciences, the National Academy of Engineering, a Fellow of the American Academy of Arts and Sciences, and a Fellow of the Royal Society (London). Among his numerous awards, he counts the 2009 IUPAP Magnetism Prize and Néel Medal, the APS’s 2012 David Adler Lectureship Award, and the 2012 von Hippel Award from the Materials Research Society. Parkin has authored ~420 papers and has ~96 issued patents.

Monday, November 4, 2013

8:00 PM (reserved seats held until 7:50 PM)

Kavli Institute for Theoretical Physics, Main Seminar Room



Admission is Free
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by October 30, 2013

at:

<http://www.kitp.ucsb.edu/public-lecture-rsvp>

or call

(805) 893-6363

Reserved seats are held
until 7:50 PM

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The KITP gratefully acknowledges its many friends in the community.

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