Einladung

zum Fakultätskolloquium im Wintersemester 2010/11

Ort: Hörsaal Hochspannungstechnik (HSI), Geb. 30.35.
Zeit: Donnerstag, 25. November 2010, 16:00 Uhr

Dr. Héctor J. De Los Santos
Karlsruher Institut für Technologie (KIT), Institut für Hochfrequenztechnik und Elektronik (IHE)

Theory of Nano-Electron-Fluidic Logic (NFL):
A New Digital “Electronics” Concept

Abstract:
As predicted by Gordon Moore more than 40 years ago, the number of transistors able to fit on a computer chip has doubled approximately every 18 months. But if the trend is to continue for the years to come, it will have to be with technology other than the conventional CMOS design. As the size of transistors gets down to the nanoscale, CMOS devices begin to suffer from several issues, in particular, increased resistance, decreased channel mobility, and increased manufacturing costs. To overcome the challenges involved with scaling, researchers from around the world have begun to look for alternatives to CMOS technology. Our recently introduced concept, called nano-electron-fluidic logic (NFL), is based, not on electron particle transport, but on the generation, propagation, and manipulation of surface plasma waves (plasmons) in an electron fluid. NFL gates are projected to exhibit femtojoule power dissipations and femtosecond switching speeds at finite temperatures, while taking full advantage of established semiconductor manufacturing infrastructure. NFL represents a paradigm shift in digital technology, and is poised as a strong candidate for “beyond-CMOS” digital logic. This talk presents the theory, physics and design principles of NFL.

gez.
Prof. Dr. rer. nat. M. Siegel

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