« NAVIGATION »

NEWS
- Bio/Medicine
- Chemicals
- Defense
- Drug Delivery
- Education
- Electronics
- Energy
- Events
- Grants
- Industry
- Investment
- Litigation
- Materials
- MEMS
- Nanofabrication
- Nanoparticles
- Nanotubes
- Optics
- Partnership
- Patent
- Products
- Quantum dots
- Research
- Smart Dust
- Software

COMPANIES
EVENTS
- Browse by Month
- Current Shows
- Previous Shows
- Submit Events

FEEDBACK
ADVERTISE
LINK TO US

XML RSS

« NEWSLETTER »

your email here
SUBSCRIBE

« SEARCH »

SEARCH

12/16/2005 12:22:50 AM

Discovery of Phenomenon Important for Future Application of Spintronics

A few years ago a University of Missouri-Columbia professor and his student had a theory, and a few weeks ago a physicist in California proved it. The unusual part is that neither person knew about the work of the other. The work has important applications for the future design of electronic devices using the "spin" instead of the "charge" of an electron.

"It was a complete surprise. They didn't know about our work and we didn't know about them," said Giovanni Vignale, MU professor of physics, who worked with Irene D'Amico, assistant professor at the University of York in the United Kingdom, who was Vignale's student at the time. "They didn't know about our work and we didn't know about them. Generally, a theorist gives an idea to an experimentalist and they are aware of each other from the beginning."

The D'Amico-Vignale theory was originally met with skepticism. They theory on 'spin coulomb drag' was in Physical Review in 2000 and Europhysics Letters in 2001. D'Amico and Vignale theorized about the behavior of the spin of electrons in semiconductors. Vignale said 'spintronics' is considered a hot field for the future of electronic devices. Computer memories are based on electric charge and need continuous power input. A spintronic device would make computer memories as permanent as a hard drive, Vignale explained, but faster, more flexible and efficient. A spintronic device would literally do away with boot-up times on computers.

"If you want to design spintronic devices then you have to take the 'spin Coulomb drag' into effect," Vignale said.

The validation for D'Amico and Vignale's work came from Joe Orenstein and his colleagues at Lawrence Berkeley National Laboratory. They discovered the effect that D'Amico and Vignale called 'spin Coulomb drag' and recognized its importance for the future design of spintronics. A search revealed that D'Amico and Vignale had not only anticipated this idea but also had formed a quantitative theory of spin diffusion. The theory and the experiment matched.

The two parties met at a physics meeting in Los Angeles this year, where Vignale was told there was a certain presentation he really should not miss. Orenstein's presentation came as a complete surprise to Vignale, who said he was gratified by the validation of his work.

"We were doing something quite different when we came up with this, as always," Vignale laughed.

Orenstein's work was published in the most recent issue of Nature.

*Other Headlines from **University of Missouri** ...*
- Radioactive Gold Nanoparticles Destroy Prostate Tumors, Leaving Healthy Tissue Untouched
- MU Researchers Create Smaller and More Efficient Nuclear Battery
- University of Missouri Scientists Go Green with Gold, Forms Company to Distribute Environmentally Friendly Nanoparticles
- Too Much Technology May Be Killing Beneficial Bacteria
- Hybrid computer materials may lead to faster, cheaper technology

*More **Research** Headlines ...*
- A Little Less Force: Making Atomic Force Microscopy Work for Cells
- Advance made in thin-film solar cell technology
- Sensor gives valuable data for neurological diseases and treatments
- NanoString Technologies Introduces Novel Solution for microRNA Research
- Three-Dimensional Cell Culture: Making Cells Feel Right at Home

« Back To List »

« GET LISTED »
- submit company
- submit news
- submit events
- advertise here

« EVENTS »
Intensive Course Nanomaterials
This course gives a broad overview on properties and fabrication processes of nano-materials.

- More Events