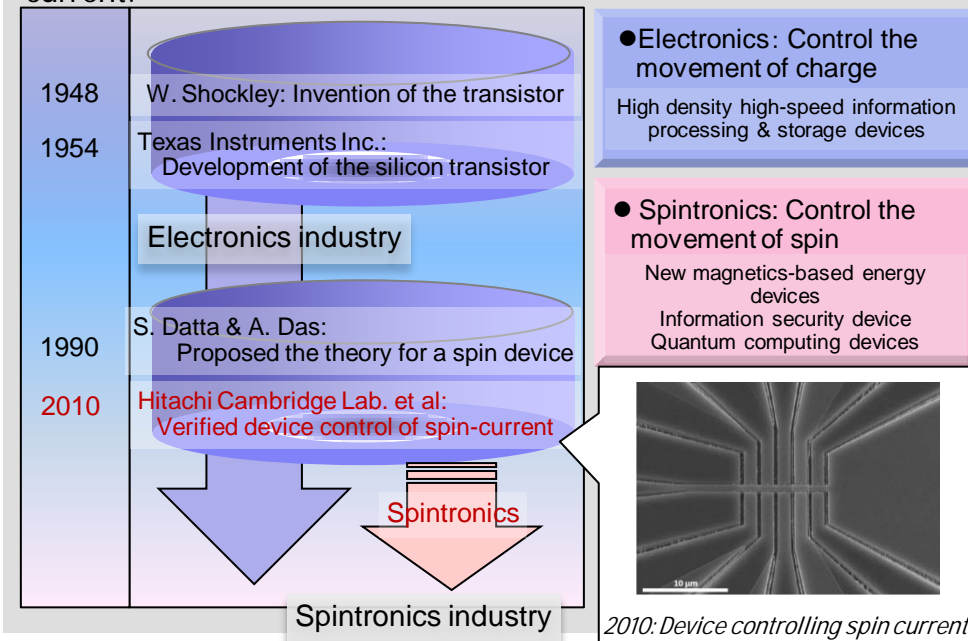


Hitachi, Ltd., web site 【24th Dec 2010 News Release】 <http://www.hitachi.com/New/cnews/101224.html>

Control & measurement of spin current, a magnetic characteristic of electrons

Published in Science

Sixty years after the development of transistors in the 1940s, an international research team* formed by physicists including Joerg Wunderlich of the Hitachi Cambridge laboratory have successfully developed technology to control and measure spin current, a magnetic characteristic of electrons, in the same way as electrical current.



Spintronics achievements at the Hitachi Cambridge Research Laboratory

World-leading spintronics research

- 2005 Measurement of the "Spin-Hall Effect" which indicates magnetic characteristics, by delivering only an electric current to a GaAs semiconductor. (Physics Review Letters, Feb 2005)
- 2009 Measurement of the "Spin-injection Hall effect," the flow of a spin-polarized current over a distance of a few microns in the same GaAs semiconductor at a temperature of -53°C. (Nature Physics, Aug 2009)
- ★ 2010 A device was developed which controls the orientation of the spin-injected into a GaAs by gate voltage, for successful ON/OFF operation. (Science, Feb 2010)

A word from the development team

Achievement of a transistor using spin current (spin transistor) is expected to contribute to significant energy conservation, increased functionality, and new directions in scientific development including quantum computing in social infrastructure.

*Hitachi Cambridge Lab., Univ. of Cambridge (U.K.), Univ. of Nottingham (U.K.), Charles University (Germany), Institute of Physics (ASCR) (Czech Republic), and Texas A&M University (U.S.A.)