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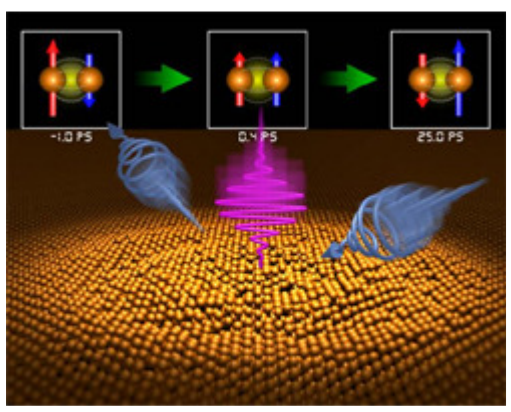
News and Events

Major EU grant for physics team

Posted on 24 August 2011

Researchers at the University of York have been awarded a major EU grant to help gain a clearer understanding of the underlying physics behind ultrafast magnetic processes.



The €4 million project, Multiscale Modelling of Femtosecond Spin Dynamics (FEMTOSPIN), will be led by Professor Roy Chantrell and Dr Irene D'Amico from the University's Department of Physics.

They will work with other world-leading research groups in Sweden, Germany, Spain and Hungary to develop new theoretical models of ultrafast processes, while innovative experiments by researchers in the Netherlands, Germany and at the University of Oxford will provide a detailed and challenging test of the model predictions.

'Spin' refers to the properties of the atomic magnetic moments of materials such as Iron, which behave dynamically in a way similar to a gyroscope. Using the heating effect of femtosecond pulsed lasers, materials can be demagnetised on the sub-picosecond timescale. The spontaneous ordering of spins, and the ability to manipulate them using an external magnetic field, forms the basis for magnetic recording technologies. Research in this area will therefore have important implications on the future speed of data processing by hard drives within computers and laptops.

Professor Chantrell said: "Over the past few years we have pioneered the use of simulations at the atomistic level at York which has given important insights into ultrafast magnetisation processes. However, while this provided a basic formalism to understand the underlying physics, it also gave rise to many important questions.

"The aim of the FEMTOSPIN project is to bring to bear the power of electronic structure calculations, atomistic simulations and large-scale models on the problem. This multiscale approach will aim to link each formalism to provide an improved understanding of the underlying physics."

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> Professor Roy Chantrell

The FEMTOSPIN project will provide a better understanding of the processes underpinning the possible development of 'all-optical' recording technology. This part of the project will be overseen by an industrial partner, Seagate Technology. The new recording technology has the potential not just for extremely high recording densities, but also for data rates around 100 times faster than currently available.

Notes to editors:

- The EU grant has been awarded to the Multiscale Modelling of Femtosecond Spin Dynamics project under the FP7 programme area on nanotechnologies and nanosciences.
- The project will be co-ordinated by the University of York and involves researchers from the following institutions: Uppsala University, Sweden; University of Konstanz, Germany; Institute of Materials Science, Madrid, Spain; Budapest University of Technology and Economics, Hungary; Radboud University Nijmegen, the Netherlands; University of Oxford, England; Queens University Belfast, Northern Ireland; Seagate Technology, Springtown, Northern Ireland; and NXP Semiconductors, Eindhoven, Netherlands.
- For further information on the University of York's Department of Physics visit www.york.ac.uk/physics

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