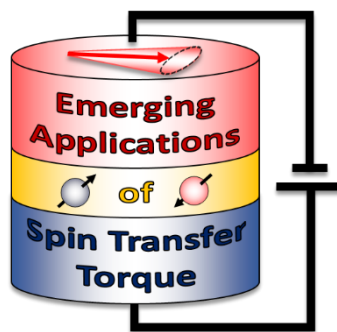


EMERGING APPLICATIONS OF SPIN TRANSFER TORQUE (EASTT)

PROGRAM



THURSDAY 28th JUNE

REGISTRATION AND COFFEE

08:00 - 09:00

Department of Physics and Astronomy

First floor meeting space

OPENING REMARKS

09:00 - 09:15

Department of Physics and Astronomy

First floor meeting room 124

R. J. Hicken

DATA STORAGE

Department of Physics and Astronomy

First floor meeting room 124

09:15

Theoretical limits of Microwave Assisted Magnetic Recording (MAMR) effective field gradient (invited) K. Rivkin¹ *1. Seagate Technology*

09:45

Modelling STOs for microwave assisted recording (invited) Alexander V. Goncharov,¹ *1. Western Digital Corporation, San Jose, CA*

10:15

Non-uniform spin transfer torque switching dynamics in CoFeB/MgO magnetic tunnel junctions *Andrea Meo,^{1*} Jessada Chureemart,² Phanwadee Chureemart,² Shuxia Wang,³ Roman Chepulskyy,³ Dmytro Apalkov,³ Pieter B. Visscher,^{4,5} Roy W. Chantrell,¹ Richard F. L. Evans¹ 1. Department of Physics, University of York, York, YO10 5DD, UK, 2. Computational and experimental magnetism group, Department of Physics, Mahasarakham University, Mahasarakham, THAILAND, 3. Samsung Electronics, Semiconductor R&D Center (Grandis), San Jose, CA 95134, USA, 4. Center for Materials for Information Technology, U. of Alabama, Tuscaloosa, AL 35401, USA, 5. Department of Physics and Astronomy, Univ. of Alabama, Tuscaloosa, AL 35401, USA*

10:30 – 11:00

BREAK

First floor meeting space

SPIN TORQUE OSCILLATORS

Department of Physics and Astronomy

First floor meeting room 124

11:00

Utilization of phase information in spin torque oscillator (*invited*) Sumito Tsunegi, Shingo Tamaru, Kay Yakushiji, Akio Fukushima, Shinji Yuasa, and Hitoshi Kubota *1. Spintronics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan*

11:30

Phase locked loop operation of spin torque oscillators M. Kreissig,¹ P. Sethi,² S. Wittrock,³ A. Litvinenko,² C. Murapaka,² K. Merazzo-Jaimes,² E. Jimenez-Romero,² J. Hem,² R. Lebrun,³ A. Jenkins,⁴ L. Vila,² M. C. Cyrille,⁵ R. Ferreira,⁴ P. Bortolotti,⁶ V. Cros,³ F. Ellinger,¹ and U. Ebels² *1. Technische Universität, Dresden, Germany, 2. Univ. Grenoble Alpes, CEA, CNRS, INAC, SPINTEC, F-38000 Grenoble, France, 3. Unité Mixte de Physique CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Paris, France, 4. International Iberian Nanotechnology Laboratory (INL), Braga, Portugal, 5. CEA, LETI, F-38000 Grenoble, France, 6. THALES TRT, Palaiseau, France*

11:45

Phase shift keying in spin torque oscillators A. Litvinenko¹, C. Murapaka¹, P. Sethi¹, A. Jenkins², L. Vila¹, V. Cros³, P. Bortolotti⁴, R. Ferreira² and U. Ebels¹ *1. Univ. Grenoble Alpes, CEA, CNRS, INAC, SPINTEC, F-38000 Grenoble, France, 2. International Iberian Nanotechnology Laboratory (INL), Braga, Portugal, 3. Unité Mixte de Physique CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Paris, France, 4. THALES TRT, Palaiseau, France*

12:00

Picosecond reorientation of in-plane magnetisation within a nano-element by spin orbit torque Paul S. Keatley,¹ G. Mihajlović,² L. Wan,² Y.S. Choi,² and J. A. Katine,² and Robert J. Hicken¹ *1. Department of Physics and Astronomy, University of Exeter, Exeter EX4 4QL, UK 2. San Jose Research Center, HGST, a Western Digital Company, San Jose, California 95135, USA*

12:15

Superposition of precessional modes within spin Hall nano-oscillators T. M. Spicer,¹ P. S. Keatley,¹ M. Dvornik,² P. Dürrenfeld,² A. Houshang,² M. Ranjbar,² A. A. Awad,² R. K. Dumas,² J. Åkerman,^{2,3,4} V. V. Kruglyak¹ and R. J. Hicken¹, *1. Department of Physics and Astronomy, University of Exeter, Stocker Road, Exeter, EX4 4QL, UK, 2. Physics Department, University of Gothenburg, Fysikgränd 3, 412 96 Gothenburg, Sweden, 3. Materials and Nano Physics, School of ICT, KTH Royal Institute of Technology, Electrum 229, 164 60 Kista, Sweden, 4. NanOsc AB, Electrum 205, 164 40 Kista, Sweden*

12:30 – 14:30

LUNCH

First floor meeting space

SPIN TORQUE OSCILLATORS: NEW MATERIALS AND GEOMETRIES

Department of Physics and Astronomy

First floor meeting room 124

14:30

Auto-generators of sinusoidal and pulsed THz-frequency signals based on antiferromagnetic dielectrics driven by spin current (invited)

Andrei N. Slavin,¹ Olga Sulymenko,² and Vasyl S. Tyberkevych¹ *1. Department of Physics, Oakland University, Rochester, Michigan 48309, USA; 2. Taras Shevchenko National University of Kyiv, Kyiv 01601, Ukraine*

15:00

Interfacial spin phenomena and opportunities for spintronics in flexible electronics (invited)

Del Atkinson¹ *1. Department of Physics, Durham University*

15:30

Towards spin torque nano oscillators based on topological insulators

Dirk Backes,* *Department of Physics, Loughborough University, UK*

15:45

Time-resolved X-ray detected ferromagnetic resonance measurements of a CoFe/NiO/Fe/NiFe multilayer structure

Takafumi Nakano,^{1,2*} Maciej Dabrowski,¹ Qian Li,³ Mengmeng Yang,³ Christoph Klewe,⁴ David Burn,⁵ Padraic Shafer,⁴ Zi Q. Qiu,³ Gerrit van der Laan,⁵ Elke Arenholz,⁴ and Robert J. Hicken¹ *1. Department of Physics and Astronomy, University of Exeter 2. JSPS Overseas Research Fellow 3. Department of Physics, University of California at Berkeley 4. Advanced Light Source, Lawrence Berkeley National Laboratory 5. Magnetic Spectroscopy Group, Diamond Light Source*

POSTER SESSION AND DRINKS

16:00 – 18:00

Department of Physics and Astronomy

First floor meeting space

BREAK

Free time

18:00 – 19:00

DRINKS RECEPTION AND WORKSHOP DINNER

19:00 – 21:00

FRIDAY 29th JUNE

SPIN TORQUE OSCILLATOR NETWORKS AND SYNCHRONISATION

Department of Physics and Astronomy

First floor meeting room 124

09:30

Spin-torque nano-oscillators for neuromorphic computing (*invited*) Philippe Talatchian,¹ Miguel Romera,¹ Sumito Tsunegi,² Flavio Abreu Araujo,¹ Hitoshi Kubota,² Kay Yakushiji,² Akio Fukushima,² Shinji Yuasa,² Juan Trastoy,¹ Paolo Bortolotti,¹ Vincent Cros,¹ Damir Vodenicarevic,³ Tifenn Hirtzlin,³ Maxence Ernout,³ Nicolas Locatelli,³ Damien Querlioz,³ and Julie Grollier¹ *1. Unité Mixte de Physique CNRS-Thales, Palaiseau, et Université Paris-Sud, Orsay, France, 2. Spintronic Research Center, AIST, Tsukuba, Japan, 3. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Orsay, France*

10:00

How synchronized spin Hall effect nano-oscillators will enable microwave and pattern matching applications (*invited*) Johan Åkerman,^{1,2} *1. Department of Physics, University of Gothenburg, Sweden, 2. Materials and Nanophysics, School of Engineering Sciences, KTH Royal Institute of Technology, Stockholm, Sweden*

10:30

Mutual Synchronization of Spin Torque Nano Oscillator with Magnetic Field Feedback Hanuman Singh^{1*}, Swapnil Bhuktare¹, Arnab Bose¹, Akio Fukushima², Kay Yakushiji², Shinji Yuasa², Hitoshi Kubota², Ashwin. A. Tulapurkar¹ *1. Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai – 400 076, India, 2. National Institute of Advanced Industrial Science and Technology (AIST), Spintronics Research Center, Ibaraki -305-8568, Japan*

10:45

Time resolved imaging of coupled nano-contact spin transfer vortex oscillators Erick. O. Burgos Parra^{1*}, Paul. S. Keatley¹, Sohrab. R. Sani², Johan. Åkerman³, Phillips Durrenfeld³, and Robert J. Hicken¹ *1. Department of Physics and Astronomy, University of Exeter, 2. Materials Physics, KTH-Royal Institute of Technology, Kista, Sweden, 3. The Physics Department, University of Gothenburg, Gothenburg, Västra Götaland, Sweden*

11:00 – 11:30

BREAK

First floor meeting space

INTERFACES AND OPTICAL SPINTRONICS

Department of Physics and Astronomy

First floor meeting room 124

11:30

Complex spin configurations in hybrid magnetic multilayer structures due to mutual spin imprinting [G Hrkac](#)^{1*}, S Gliga⁴, T Thomson³, LJ Heyderman^{2,4} *1. College of Engineering, Mathematics and Physical Sciences, University of Exeter, Devon, UK 2 ETH, Zurich, Switzerland 3 School of Computer Science, University of Manchester, Manchester, UK 4 Laboratory for Micro- and Nanotechnology, Paul Scherrer Institut, Villigen, Switzerland*

11:45

Femtosecond optical torques and electric currents at interfaces of magnetic metallic heterostructures [Rostislav V. Mikhaylovskiy](#),^{1*} Guanquao Li,¹ Thomas J. Huisman,¹ Jose D. Costa,² Theo Rasing,¹ and Alexey V. Kimel¹ *1. Institute for Molecules and Materials, Radboud University, 2. International Iberian Nanotechnology Laboratory (INL)*

12:00 – 14:00

LUNCH

First floor meeting space

14:00 - 16:00

LABORATORY TOURS AND INFORMAL DISCUSSION

Department of Physics and Astronomy

16:00 – 17:00

BREAK

Free time

17:00 - 18:00

WALK TO THE QUAY (WEATHER PERMITTING)

Route passing Exeter Castle and Cathedral

18:00 – 21:00

INFORMAL DINNER

Quayside bar/restaurant