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\"*Layered Magnetic Structures: Spin Dynamics and Spin Torque Switching Across Nanocontacts*\" ~~Spin Dynamics in Nanomagnets I - Andrew Kent~~ Spin Dynamics in Nanomagnets II - Andrew Kent ~~Spin Dynamics - Magnetic resonance instruments~~ ~~Introduction to atomistic spin models~~

Prof Jason Petta - Coherent Coupling of Spin and Light**Wulff Lecture: Funny Microscope Videos - Prof. Frances M. Ross**

Exciton | Bsc Sem - 5 | Paper ~ 305 | Delta Physics*Spin 1/2 in a B-field Spin Dynamics in Nanomagnets III - Andrew Kent* Andrew Mackenzie "Quantum oscillations in solids past, present and future" Registering For My First Semester Of Physics Graduate School ~~What is Quantum Mechanical Spin?~~ *Easy Graphene Made in Bulk - Electrochemical Exfoliation* Spin Wave Animation 2D Materials Beyond Graphene **Spin 1/2** ~~Semiconductor Exciton Polaritons~~ The Spin on Electronics! -Spintronics- The Nanoscience and Nanotech of Spin Currents | Stuart Parkin *Chi-Feng Pai, \"From spin transfer torque, spin Hall torque, to spin-orbit torque\" Part II*

Quantum Optics - introduction to the course

Magnetism: Nanomagnetism Applications~~21 - Time reversal symmetry breaking, spin orbit interactions and spintronics - Amnon Aharony~~ The Rise of MXenes - Impact of Materials Discovery on Technological Progress - Yury Gogotsi

Talks - Spin Dynamics in the Dirac Systems - Claudia Felser, MPI Dresden

Spin and valley physics in semiconducting 2D systems - JIYONG FU~~Magnetic and Static = Aether (Proof)~~ Ramamoorthy Ramesh | Electric Field Control of Magnetism

Mark Stiles - Spin Current: the Torque Wrench of SpintronicsTalks - Antiferromagnetic Spintronics - Eberhard Gross - Ultrafast laser driven spin dynamics *Magnetic Nanostructures Spin Dynamics And*

Nanomagnetism and spintronics is a rapidly expanding and increasingly important field of research with many applications already on the market and many more to be expected in the near future. This field started in the mid-1980s with the discovery of the GMR effect, recently awarded with the Nobel prize to Albert Fert and Peter Grünberg.

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Magnetic Nanostructures: Spin Dynamics and Spin Transport ...

The interconnection between the spin current and spin dynamics via the spin-dependent scattering and an accompanying by spin torque effect in ferromagnetic/normal metal based magnetic multilayer nanostructures is studied including a high fast out-of-equilibrium spin dynamics. Features of the spin transport through interfaces and its impact on spin dynamics are described on the base of the scattering matrix formalism for spin flows.

Spin Transport and Dynamics in Multilayer Magnetic ...

The elementary physical mechanisms involving the spin dynamics when exciting magnetic nanostructures with femtosecond optical pulses are considered. The variety of experimental methods and theoretical approaches used to study the magnetic properties of the materials on a broad range of temporal and spatial scales are examined.

Ultrafast magnetization dynamics of nanostructures - Bigot ...

The objective, invariably, is to control and study spin dynamics using charge and elastic degrees of freedom. In certain cases, an understanding of this coupling can be exploited reciprocally to employ magnetic fields in controlling the charge and/or elastic dynamics.

Coupled spin, elastic and charge dynamics in magnetic ...

accompanying by spin torque effect in ferromagnetic/normal metal based magnetic multilayer nanostructures is studied including a high fast out-of-equilibrium spin dynamics. Features of the spin transport through interfaces and its impact on spin dynamics are described on the base of the scattering matrix formalism for spin flows.

Spin Transport and Dynamics in Multilayer Magnetic ...

Engineering and Physical Sciences Research Council (EPSRC) Date: 2 November 2020

Magnetisation dynamics and tuneable GHz properties of ...

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Magnetic Nanostructures: Spin Dynamics and Spin Transport ...

The field of spintronics is dynamic and evolving at a tremendous pace. This field is centered on the creation and manipulation of spin currents and their use in manipulating magnetic moments via the transfer of spin and orbital angular momenta. Just in the past 3 years the conversion of pure charge currents to pure spin currents has made major advances with unforeseen efficiencies in simple metals of up to 50% and perhaps even greater efficiencies in unconventional topological matter.

2017 Spin Dynamics in Nanostructures Conference GRC

In magnetic materials, both the dynamics and life-times of hot-electrons depend on their spin polarization [22{24]. These dierences lead to the concept of spin-dependent transport upon laser excitation and thus to the generation of ultrafast spin cur- rent pulses.

Nanomagnetism and spintronics is a rapidly expanding and increasingly important field of research with many applications already on the market and many more to be expected in the near future. This field started in the mid-1980s with the discovery of the GMR effect, recently awarded with the Nobel prize to Albert Fert and Peter Grünberg. The present volume covers the most important and most timely aspects of magnetic heterostructures, including spin torque effects, spin injection, spin transport, spin fluctuations, proximity effects, and electrical control of spin valves. The chapters are written by internationally recognized experts in their respective fields and provide an overview of the latest status.

This book provides a comprehensive overview of the latest developments in the field of spin dynamics and magnetic damping. It discusses the various ways to tune damping, specifically, dynamic and static control in a ferromagnetic layer/heavy metal layer. In addition, it addresses all optical detection techniques for the investigation of modulation of damping, for example, the time-resolved magneto-optical Kerr effect technique.

Abstract: We present our extensive research into magnetic anisotropy. We tuned the terrace width of Si(111) substrate by a novel method: varying the direction of heating current and consequently manipulating the magnetic anisotropy of magnetic structures on the stepped substrate by decorating its atomic steps. Laser-induced ultrafast demagnetization of a CoFeB/MgO/CoFeB magnetic tunneling junction was explored by the time-resolved magneto-optical Kerr effect (TR-MOKE) for both the parallel state (P state) and the antiparallel state (AP state) of the magnetizations between two magnetic layers. It was observed that the demagnetization time is shorter and the magnitude of demagnetization is larger in the AP state than those in the P state. These behaviors are attributed to the ultrafast spin transfer between two CoFeB layers via the tunneling of hot electrons through the MgO barrier. Our observation indicates that ultrafast demagnetization can be engineered by the hot electron tunneling current. This opens the door to manipulate the ultrafast spin current in magnetic tunneling junctions. Furthermore, an all-optical TR-MOKE technique provides the flexibility for exploring the nonlinear magnetization dynamics in ferromagnetic materials, especially with metallic materials.

Presenting recent scientific achievements in the investigation of magnetization dynamics in confined magnetic systems, this volume includes six chapters originating from different groups of experimentalists and theoreticians dominating the field since the discovery of the effect. Different chapters of the book reflect different facets of spin wave confinement, providing a comprehensive description of the effect and its place in modern magnetism. Valuable for scientists and engineers working on magnetic storage elements and magnetic logic, the guide is also suitable as an advanced textbook for graduate students.

The development of the spintronic-based data storage devices such as spin transfer torque magnetoresistive random access memory (STT-MRAM) is being driven by the surging data consumption and demand for faster data processing. The advantages of nonvolatility, higher data processing speed, lower power consumption and scalability hold the promise of the popularity of STT-MRAM in the future, of which spin transfer torque (STT) effect is the key. This thesis develops a spin diffusion model to study the spin dynamics in nanomagnetic structures and the corresponding STT effect acting on local magnetic moments. Chapter 2 provides an introduction to micromagnetic modeling, dominant magnetic interactions, and domain walls. Chapter 3 presents spin diffusion model, in which two approaches are discussed for handling the boundary conditions and we demonstrate their good performance in solving spin diffusion equation in finite element models. Chapter 3 also shows solutions for the spin accumulation in multi-layered magnetic structures at equilibrium and in dynamics. It also studies the case of spin transfer torque in magnetic nanostructures with the Néel wall, comparing it to the simplified Zhang & Li model. At the end of the chapter 3 we simulate the magnetization dynamics under STT effect using the FastMag micromagnetic simulation software coupled with the spin diffusion model.

"This book is a collection of lecture notes which were presented by invited speakers at the Eleventh School on Theoretical Physics "Symmetry and Structural Properties of Condensed Matter SSPCM 2014" in Rzeszów (Poland) in September 2014. The main challenge for the lecturers was the objective to present their subject as a review as well as in the form of introduction for beginners. Topics considered in the volume concentrate on: spin dynamics and spin transport in magnetic and non-magnetic structures, spin-orbit interaction in two-dimensional systems and graphene, and new mathematical method used in the condensed matter physics."--

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Provides a semi-quantitative approach to recent developments in the study of optical properties of condensed matter systems Featuring contributions by noted experts in the field of electronic and optoelectronic materials and photonics, this book looks at the optical properties of materials as well as their physical processes and various classes. Taking a semi-quantitative approach to the subject, it presents a summary of the basic concepts, reviews recent developments in the study of optical properties of materials and offers many examples and applications. Optical Properties of Materials and Their Applications, 2nd Edition starts by identifying the processes that should be described in detail and follows with the relevant classes of materials. In addition to featuring four new chapters on optoelectronic properties of organic semiconductors, recent advances in electroluminescence, perovskites, and ellipsometry, the book covers: optical properties of disordered condensed matter and glasses; concept of excitons; photoluminescence, photoinduced changes, and electroluminescence in noncrystalline semiconductors; and photoinduced bond breaking and volume change in chalcogenide glasses. Also included are chapters on: nonlinear optical properties of photonic glasses; kinetics of the persistent photoconductivity in crystalline III-V semiconductors; and transparent white OLEDs. In addition, readers will learn about excitonic processes in quantum wells; optoelectronic properties and applications of quantum dots; and more. Covers all of the fundamentals and applications of optical properties of materials Includes theory, experimental techniques, and current and developing applications Includes four new chapters on optoelectronic properties of organic semiconductors, recent advances in electroluminescence, perovskites, and ellipsometry Appropriate for materials scientists, chemists, physicists and electrical engineers involved in development of electronic materials Written by internationally respected professionals working in physics and electrical engineering departments and government laboratories Optical Properties of Materials and Their Applications, 2nd Edition is an ideal book for senior undergraduate and postgraduate students, and teaching and research professionals in the fields of physics, chemistry, chemical engineering, materials science, and materials engineering.

In recent years, the physics community has experienced a revival of interest in spin effects in solid state systems. On one hand, the solid state systems, particularly, semiconductors and semiconductor nanosystems, allow us to perform benchtop studies of quantum and relativistic phenomena. On the other hand, this interest is supported by the prospects of realizing spin-based electronics, where the electron or nuclear spins may play a role of quantum or classical information carriers. This book looks in detail at the physics of interacting systems of electron and nuclear spins in semiconductors, with particular emphasis on low-dimensional structures. These two spin systems naturally appear in practically all widespread semiconductor compounds. The hyperfine interaction of the charge carriers and nuclear spins is particularly prominent in nanosystems due to the localization of the charge carriers, and gives rise to spin exchange between these two systems and a whole range of beautiful and complex physics of manybody and nonlinear systems. As a result, understanding of the intertwined spin systems of electrons and nuclei is crucial for in-depth studying and controlling the spin phenomena in semiconductors. The book addresses a number of the most prominent effects taking place in semiconductor nanosystems including hyperfine interaction, nuclear magnetic resonance, dynamical nuclear polarization, spin-Faraday and spin-Kerr effects, processes of electron spin decoherence and relaxation, effects of electron spin precession mode-locking and frequency focussing, as well as fluctuations of electron and nuclear spins.

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