

Karine Chesnel

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2008 Jan- **Assistant Professor** of Physics at Brigham Young University, Utah

2007 : **Post-doc** at the Laboratoire National des Champs magnétiques Pulsés (CNRS),
Toulouse, France

2003-2006: **Post-doc** at the Lawrence Berkeley National Laboratory, California

2002: **Ph.D.** in Physics (Condensed Matter) prepared at ESRF, Grenoble, France.

"Magnetic nanostructures studied with X-ray Resonant Magnetic Scattering"

1999: **DEA** "Physic of condensed matter" at the University Joseph Fourier, France

1998: **Agrégation** (University teaching diploma) in Physics, Paris, France

1997: **M. S.** in Physics, Ecole Normale Supérieure, Lyon, France

1996: **B. S.** in Physics and in Chemistry, Ecole Normale Supérieure, Lyon, France

1992-95: Undergraduate studies in Sciences, Aix-en-Provence, France

1992 **Baccalaureate** (scientific section), Aix-en-Provence, France

Current Research Interests

Investigate the electronic and magnetic properties in condensed matter at the nanoscale, using in particular the interaction with electromagnetic radiation: spectroscopy, circular and linear dichroism, X-ray diffraction, diffuse scattering, resonant magnetic scattering, use of coherent light, speckles metrology, lensless imaging, as well as X-ray and electron microscopy techniques. I am interested in studying confinement effects in nanostructures, nanoparticles, thin films, exchange bias systems, spin reorientation transitions, highly correlated systems, and probing the magnetic ordering, domain switching, spatio-temporal fluctuations and fast dynamic phenomena.

Research experience

2007 (Jan-Dec): Research position at the **Laboratoire des champs magnétiques pulsés (CNRS)** at Toulouse, France. Study of phase transitions in polycrystals under high magnetic fields. Experiments performed via X-ray diffraction under intense magnetic fields, generated by intense current pulses (30T), at the synchrotron facility in Grenoble (**European Synchrontron Radiation Facility**) .

Techniques

- Hard X-ray diffraction (XRD) under intense magnetic field

2003-2006: Post-doc at **Advanced Light Source**, Lawrence Berkeley National Laboratory. Development of coherent X-ray resonant magnetic scattering, including the assembling, installation and characterization of a new instrumentation (scattering chamber, pumping system, manipulator, cryostat, electromagnets and detectors). I helped to initiate several scientific projects and collaborations with the first users of the instrument and to work on a specific research area focusing on magnetic properties in nanostructures like nanoparticles, or exchange bias thin films. I have been also involved with complementary scattering and spectroscopy experiments at the ALS.

- Soft X-ray spectroscopy and circular dichroism (XMCD)
- Soft X-ray resonant magnetic scattering (XRMS)
- Coherent scattering (speckle)
- Pinhole preparation (FIB)

1999-2002: PhD in the group of Physics of Materials and Microstructures at the CEA-Grenoble, France, studying striped magnetic domains of thin films of FePd alloys and Co/Pt multilayers with strong magnetic anisotropy.

- Soft X-ray resonant magnetic scattering using synchrotron sources: **ESRF** (France), and **Daresbury Laboratory (SLS)**, UK.
- Molecular Beam Epitaxy and sputtering
- Magnetic Force Microscopy
- Magnetometry (VSM, MOKE, Hall effect)

1997: Master's training in the group of Condensed Phases Dynamic, at the University of Montpellier, France, studying the vibrational dynamic and the phase's transitions of the fullerenes C_{60} , $Cs C_{60}$ and $C_{59}N$.

- Raman spectroscopy
- Infrared Absorption Spectroscopy
- Inelastic Neutron Scattering in the **LLB** laboratory, Saclay, France.

1996: Degree's training in the group of Ion-Molecules Interactions, at the University of Marseille, France, studying the hyperfine electronic structure of Rubidium atoms.

- Infrared spectroscopy using a laser diode.

Conferences and seminars

International conferences (talks)

APS March Meeting 2009, Pittsburgh, USA
European Material Research Conference 2007, Warsaw, Poland
Workshop on Diffraction, HASYLAB 2007, Hamburg, Germany (invited)
School of Magnetism 2007, Cargese, Corsica
Coherence 2007, Monterey, California
Coherence 2005, Porquerolles, France
Workshop SOLEIL Soft-X microscopy, 2005, France (invited)
APS March meeting 2005, Los Angeles, USA
APS March meeting 2004, Montreal, Canada
MRS Fall meeting 2003, Boston (invited)
ALS user meeting 2004, Berkeley
ALS user meeting 2003, Berkeley (invited)
ESRF user meeting 2002, France (invited)
Intermag-MMM 2001, San Antonio Texas

Seminars

Idaho State University, Pocatello, April 20, 2009
Arizona State University, Phoenix, 2 October 2008
Utah Valley State College, Utah, 5 March 2008
University Pierre et Marie Curie, France, 17 May 2006
Lawrence Livermore National Laboratory, California 10 May 2006
SUNY Albany, New York, 12 April 2006
Swiss Light Source, Switzerland, 15 Jan 2006
Argonne National Laboratory, Illinois, 12 Dec 2005
Brigham Young University, Utah, 16 Nov. 2005
Brookhaven National Laboratory, New York, 17 March 2005
BESSY, Berlin, Germany 18 Feb. 2005