

TABLE OF CONTENTS

- 4..... Introduction from the Director

LIFE SCIENCES

Biochemistry and biology

- 6..... Identification of the *Caenorhabditis elegans* Mating Pheromone
- 7..... Topology and Structure of Phospholamban Monomer in Oriented DOPC Lipid Bilayers
- 8..... COLMAR Web Server Assisted Metabolic Mixture Analysis by Heteronuclear NMR
- 9..... HFEPR Studies of Aminocarboxylate Complexes of Vanadium(III) in Frozen Aqueous Solution
- 10..... Enhanced Digestion Efficiency, Peptide Ionization Efficiency, and Sequence Resolution for Protein Hydrogen/Deuterium Exchange Monitored by FT-ICR Mass Spectrometry
- 12..... MR Microscopy of Neuronal Activity in Brain Slices

CHEMISTRY

Chemistry, magnetic resonance techniques, geochemistry

- 14..... Petroleomics: Chemistry of the Underworld
- 15..... Application of Solid-State ^{35}Cl NMR Spectroscopy for the Detection of Polymorphism in a Variety of Hydrochloride Pharmaceutical Drugs
- 16..... Spectroscopy for the Detection of Polymorphism in a Variety of Hydrochloride Pharmaceutical Drugs
- 18..... Enhancing Spectral Resolution of Dipolar-Encoded HETCOR Spectra at 900 MHz

MAGNET SCIENCE & TECHNOLOGY

Engineering materials, instrumentation, magnet technology, superconductivity-applied

- 20..... Gadolinium Doped Gold-Speckled Nanoparticles for Multimodal Imaging
- 21..... Experimental Optimization of Magic Angle Spinning Solid State NMR Spectroscopy at 750 MHz
- 22..... Modeling of Nb_3Sn CICC Performance Degradation due to Strand Bending and Inter-filament Current Transfer
- 23..... Fracture Behavior of ITER and HEP-style Nb_3Sn Superconducting Strand
- 25..... Significant Reduction of AC Losses in YBCO Patterned Coated Conductors with Transposed Filaments
- 26..... 33.8 Tesla with a $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ Superconducting Test Coil
- 27..... Bi2212 Conductor and Coil Technology for High Field Magnets
- 28..... 70 T User Magnet Delivers 250 Pulses at Pulsed Field Facility

MAG LAB REPORTS

Published by:
**NATIONAL HIGH MAGNETIC
 FIELD LABORATORY**
 1800 E. Paul Dirac Drive
 Tallahassee, FL
 32310-3706
 Tel: 850-644-0311
 Fax: 850-644-8350
www.magnet.fsu.edu

MAG LAB DIRECTOR
 Greg Boebinger

**ASSOCIATE DIRECTOR
 FOR MANAGEMENT
 AND ADMINISTRATION**
 Brian Fairhurst

**DIRECTOR OF
 PUBLIC AFFAIRS**
 Susan Ray

EDITOR
 Amy Mast

**ART DIRECTION
 AND PRODUCTION**
 Savoy Brown

CONDENSED MATTER PHYSICS

Kondo/heavy fermion systems; magnetism and magnetic materials; metal-insulator transitions; molecular conductors; other condensed matter; quantum fluids and solids; semiconductors; quantum fluids and solids; semiconductors; superconductivity-basic

30. Charge Order, Dynamics,
and Magneto-structural Transition in Multiferroic LuFe_2O_4
31. Multiple Magnetic Phases
in the Frustrated $S=1$ Spin-Dimer Compound $\text{Ba}_3\text{Mn}_2\text{O}_8$
32. Cascade of Magnetic-Field-Induced Quantum Phase Transitions
in the $S=1/2$ Triangular-Lattice Antiferromagnet Cs_2CuBr_4
33. 2D-MIT as a Wigner-Mott Transition
34. Dependence of Effective Mass on Spin and Valley Degrees of Freedom
35. Wigner Crystallization in a Quasi-Three-Dimensional Electron System
37. Evidence for a Fractional Quantum Hall State
at $\nu = 1/4$ in a Wide Quantum Well
38. Phase Transitions of Dirac Electrons in Bismuth
39. Quenching Spin Decoherence in Diamond
through Spin Bath Polarization
40. Coherent Manipulation and Decoherence
of $S=10$ Single-Molecule Magnets
41. Magnetic Susceptibility Measurements to 1 mK and 13 T to Determine the
Universality Class of Bose-Einstein Condensation in $\text{Ni-Cl}_2\text{-4SC(NH}_2)_2$
42. High Field Magneto-Optical Studies
of Liquid Crystals and Complex Fluids
44. Fermi Surface of Superconducting LaFePO
Determined from Quantum Oscillations
45. Quantum Oscillations in the Parent Phase
of an Iron Arsenide Superconductor
46. Nearly Isotropic Superconductivity in $(\text{Ba,K})\text{Fe}_2\text{As}_2$

This document is available in alternate formats upon request. Contact Amy Mast for assistance. If you would like to be added to our mailing list, please write us at the address shown at left, call 850-644-1933, or e-mail winters@magnet.fsu.edu.

Trying to reduce your carbon footprint?



Sign up for an online subscription at
[http://www.magnet.fsu.edu/mediacenter/
 publications/subscribe.aspx](http://www.magnet.fsu.edu/mediacenter/publications/subscribe.aspx)