



Schematic of an experiment at the OMEGA laser facility for the production and measurement of x rays from a Ti-doped aerogel target. Because of its low density the aerogel, after being ionized by the laser beams, is an efficient source of x rays, converting about one percent of the incident laser energy into Ti K-shell radiation. See article 165005.



PHYSICAL REVIEW LETTERS

Contents

Articles published 17 April–23 April 2004

VOLUME 92, NUMBER 16

23 APRIL 2004

General Physics

- Exact Pairing Correlations for One-Dimensionally Trapped Fermions with Stochastic Mean-Field Wave Functions ... 160401
O. Juillet, F. Gulminelli, and Ph. Chomaz
- Superfluid Transitions in Bosonic Atom-Molecule Mixtures near a Feshbach Resonance 160402
Leo Radzihovsky, Jae Park, and Peter B. Weichman
- Controlled Vortex-Sound Interactions in Atomic Bose-Einstein Condensates 160403
N.G. Parker, N.P. Proukakis, C.F. Barengi, and C.S. Adams
- High Temperature Expansion Applied to Fermions near Feshbach Resonance 160404
Tin-Lun Ho and Erich J. Mueller
- Tkachenko Waves in Rapidly Rotating Bose-Einstein Condensates 160405
L.O. Baksmaty, S.J. Woo, S. Choi, and N.P. Bigelow
- Entanglement Interferometry for Precision Measurement of Atomic Scattering Properties 160406
Artur Widera, Olaf Mandel, Markus Greiner, Susanne Kreim, Theodor W. Hänsch, and Immanuel Bloch
- Collisionally Induced Transport in Periodic Potentials 160601
H. Ott, E. de Mirandes, F. Ferlino, G. Roati, G. Modugno, and M. Inguscio
- Manipulating Small Particles in Mixtures far from Equilibrium 160602
Sergey Savel'ev, Fabio Marchesoni, and Franco Nori
- Apparent Hysteresis in a Driven System with Self-Organized Drag 160603
Mikko Haataja, David J. Srolovitz, and Ioannis G. Kevrekidis

Gravitation and Astrophysics

- Scaling Behavior in a Stochastic Self-Gravitating System 161101
N. V. Antonov
- Experimental Demonstration of a Classical Analog to Quantum Noise Cancellation for Use in Gravitational Wave Detection 161102
C.M. Mow-Lowry, B.S. Sheard, M.B. Gray, D.E. McClelland, and S.E. Whitcomb

Elementary Particles and Fields

- Dirac Neutrino Masses with Planck Scale Lepton Number Violation 161601
Tony Gherghetta
- Weakened Constraints from $b \rightarrow s\gamma$ on Supersymmetry Flavor Mixing Due to Next-To-Leading-Order Corrections 161801
Ken-ichi Okumura and Leszek Roszkowski
- Measurement of the Negative Muon Anomalous Magnetic Moment to 0.7 ppm 161802
G.W. Bennett *et al.* (Muon ($g - 2$) Collaboration)
- B_s and D_s Decay Constants in Three-Flavor Lattice QCD 162001
Matthew Wingate, Christine T.H. Davies, Alan Gray, G. Peter Lepage, and Junko Shigemitsu
- Simplified Test of Universality in Lattice QCD 162002
David H. Adams

(Continued on Third Cover)



Contents (Continued)

Ambiguities in the Up-Quark Mass	162003
Michael Creutz	
Nuclear Physics	
Traces of Thermalization from p_t Fluctuations in Nuclear Collisions	162301
S. Gavin	
Is the Nuclear Spin-Orbit Interaction Changing with Neutron Excess?	162501
J.P. Schiffer, S.J. Freeman, J.A. Caggiano, C. Deibel, A. Heinz, C.-L. Jiang, R. Lewis, A. Parikh, P.D. Parker, K.E. Rehm, S. Sinha, and J.S. Thomas	
Atomic, Molecular, and Optical Physics	
Fully Differential Cross Sections for Photo-Double-Ionization of D_2	163001
Th. Weber, A. Czasch, O. Jagutzki, A. Müller, V. Mergel, A. Kheifets, J. Feagin, E. Rotenberg, G. Meigs, M.H. Prior, S. Daveau, A.L. Landers, C.L. Cocke, T. Osipov, H. Schmidt-Böcking, and R. Dörner	
Generation of Coherent Soft-X-Ray Radiation Extending Far Beyond the Titanium L Edge	163002
Enikő Seres, József Seres, Ferenc Krausz, and Christian Spielmann	
Two-Level Systems with Relaxation	163003
David E. Rourke, Larisa Khodarinova, and Alexander A. Karabanov	
Intense-Laser-Field Ionization of Molecular Hydrogen in the Tunneling Regime and Its Effect on the Vibrational Excitation of H_2^+	163004
X. Urbain, B. Fabre, E.M. Staicu-Casagrande, N. de Ruette, V.M. Andrianarijaona, J. Jureta, J.H. Posthumus, A. Saenz, E. Baldit, and C. Cornaggia	
Coherence Properties of Guided-Atom Interferometers	163201
H. Kreutzmann, U.V. Poulsen, M. Lewenstein, R. Dumke, W. Ertmer, G. Birkel, and A. Sanpera	
Interaction of $NH(X^3\Sigma^-)$ Molecules with Rubidium Atoms: Implications for Sympathetic Cooling and the Formation of Extremely Polar Molecules	163202
Pavel Soldán and Jeremy M. Hutson	
Extremely Stable Metal-Encapsulated $AlPb_{10}^+$ and $AlPb_{12}^+$ Clusters: Mass-Spectrometric Discovery and Density Functional Theory Study	163401
S. Neukermans, E. Janssens, Z.F. Chen, R.E. Silverans, P.v.R. Schleyer, and P. Lievens	
Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.	
From Nearly Tilted Waves to Cavity Phase Solitons in Broad Area Lasers with Squeezed Vacuum	163901
Oscar G. Calderón, Eduardo Cabrera, M.A. Antón, I. Gonzalo, F. Carreño, and J.M. Guerra	
Experimental Observation of Discrete Modulational Instability	163902
J. Meier, G.I. Stegeman, D.N. Christodoulides, Y. Silberberg, R. Morandotti, H. Yang, G. Salamo, M. Sorel, and J.S. Aitchison	
Computational Lens for the Near Field	163903
P. Scott Carney, Richard A. Frazin, Sergey I. Bozhevolnyi, Valentyn S. Volkov, Alexandra Boltasseva, and John C. Schotland	
Real-Time Construction of Optimized Predictors from Data Streams	164101
Frank Kwasniok and Leonard A. Smith	
Fluidized Granular Medium as an Instance of the Fluctuation Theorem	164301
Klebert Feitosa and Narayanan Menon	
Mixing by Polymers: Experimental Test of Decay Regime of Mixing	164501
T. Burghlea, E. Segre, and V. Steinberg	
Plasma and Beam Physics	
Observation of Multipactor in an Alumina-Based Dielectric-Loaded Accelerating Structure	164801
J.G. Power, W. Gai, S.H. Gold, A.K. Kinkead, R. Konecny, C. Jing, W. Liu, and Z. Yusof	
Study of Hot Electrons by Measurement of Optical Emission from the Rear Surface of a Metallic Foil Irradiated with Ultraintense Laser Pulse	165001
Jian Zheng, K.A. Tanaka, T. Sato, T. Yabuuchi, T. Kurahashi, Y. Kitagawa, R. Kodama, T. Norimatsu, and T. Yamanaka	

(Continued on Preceding Page)

Contents (Continued)

New Paradigm for the Isotope Scaling of Plasma Transport Paradox	165002
V. Sokolov and A.K. Sen	
Computations of Intermittent Transport in Scrape-Off Layer Plasmas	165003
O.E. Garcia, V. Naulin, A.H. Nielsen, and J. Juul Rasmussen	
Role of Flow Shear in the Ballooning Stability of Tokamak Transport Barriers	165004
A.J. Webster and H.R. Wilson	
Efficient Multi-keV X-Ray Sources from Ti-Doped Aerogel Targets	165005
K.B. Fournier, C. Constantin, J. Poco, M.C. Miller, C.A. Back, L.J. Suter, J. Satcher, J. Davis, and J. Grun	
Emission Measurements of a Laser-Wakefield-Accelerated Electron Beam	165006
S. Fritzler, E. Lefebvre, V. Malka, F. Burgy, A.E. Dangor, K. Krushelnick, S.P.D. Mangles, Z. Najmudin, J.-P. Rousseau, and B. Walton	
Condensed Matter: Structure, etc.	
Probing Nanoscale Dipole-Dipole Interactions by Electric Force Microscopy	166101
T. Mélin, H. Diesinger, D. Deresmes, and D. Stiévenard	
Dipole-Dependent Slip of Newtonian Liquids at Smooth Solid Hydrophobic Surfaces	166102
Jae-Hie J. Cho, Bruce M. Law, and François Rieutord	
New Alkali Doped Pillared Carbon Materials Designed to Achieve Practical Reversible Hydrogen Storage for Transportation	166103
Wei-Qiao Deng, Xin Xu, and William A. Goddard	
Hierarchical Self-Assembly of GaAs/AlGaAs Quantum Dots	166104
A. Rastelli, S. Stuffer, A. Schliwa, R. Songmuang, C. Manzano, G. Costantini, K. Kern, A. Zrenner, D. Bimberg, and O.G. Schmidt	
Long Jump Rates in Surface Diffusion: W on W(110)	166105
Grazyna Antczak and Gert Ehrlich	
The Optimal Faucet	166106
H. Henry Chen and Michael P. Brenner	
Condensed Matter: Electronic Properties, etc.	
Direct Observation of High-Temperature Polaronic Behavior in Colossal Magnetoresistive Manganites	166401
N. Mannella, A. Rosenhahn, C.H. Booth, S. Marchesini, B.S. Mun, S.-H. Yang, K. Ibrahim, Y. Tomioka, and C.S. Fadley	
Co-occurrence of Superparamagnetism and Anomalous Hall Effect in Highly Reduced Cobalt-Doped Rutile $\text{TiO}_{2-\delta}$ Films	166601
S.R. Shinde, S.B. Ogale, J.S. Higgins, H. Zheng, A.J. Millis, V.N. Kulkarni, R. Ramesh, R.L. Greene, and T. Venkatesan	
Multiple First-Order Metamagnetic Transitions and Quantum Oscillations in Ultrapure $\text{Sr}_3\text{Ru}_2\text{O}_7$	166602
R.S. Perry, K. Kitagawa, S.A. Grigera, R.A. Borzi, A.P. Mackenzie, K. Ishida, and Y. Maeno	
Quantum Shuttle Phenomena in a Nanoelectromechanical Single-Electron Transistor	166801
D. Fedorets, L.Y. Gorelik, R.I. Shekhter, and M. Jonson	
Evidence for a Quantum Phase Transition in $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_{4-\delta}$ from Transport Measurements	167001
Y. Dagan, M.M. Qazilbash, C.P. Hill, V.N. Kulkarni, and R.L. Greene	
Orbital Ordering in Charge Transfer Insulators	167201
M.V. Mostovoy and D.I. Khomskii	
Planar Spin Fluctuations with a Quadratic Thermal Dependence Rate in Spin Liquid $\text{Gd}_3\text{Ga}_5\text{O}_{12}$	167202
P. Bonville, J.A. Hodges, J.P. Sanchez, and P. Vulliet	
Spin Anisotropy and Slow Dynamics in Spin Glasses	167203
F. Bert, V. Dupuis, E. Vincent, J. Hammann, and J.-P. Bouchaud	
Effective Reduction of Critical Current for Current-Induced Magnetization Switching by a Ru Layer Insertion in an Exchange-Biased Spin Valve	167204
Y. Jiang, S. Abe, T. Ochiai, T. Nozaki, A. Hirohata, N. Tezuka, and K. Inomata	
Structure of Ferromagnetic CrAs Epilayers Grown on GaAs(001)	167205
V.H. Etgens, P.C. de Camargo, M. Eddrief, R. Mattana, J.M. George, and Y. Garreau	

(Continued on Preceding Page)

Contents (Continued)

Percolative Conduction in the Half-Metallic-Ferromagnetic and Ferroelectric Mixture of (La, Lu, Sr)MnO ₃	167206
S. Park, N. Hur, S. Guha, and S.-W. Cheong	
Interdisciplinary Physics: Biological Physics, Quantum Information, etc.	
Proposal for Energy-Time Entanglement of Quasiparticles in a Solid-State Device	167901
Valerio Scarani, Nicolas Gisin, and Sandu Popescu	
Concurrence of Mixed Bipartite Quantum States in Arbitrary Dimensions	167902
Florian Mintert, Marek Kuś, and Andreas Buchleitner	
Triggered Qutrits for Quantum Communication Protocols	167903
G. Molina-Terriza, A. Vaziri, J. Řeháček, Z. Hradil, and A. Zeilinger	
Internal States of Active Inclusions and the Dynamics of an Active Membrane	168101
Hsuan-Yi Chen	
Phyllotactic Patterns on Plants	168102
Patrick D. Shipman and Alan C. Newell	
Site-Specific Dissociation of DNA Bases by Slow Electrons at Early Stages of Irradiation	168103
Hassan Abdoul-Carime, Sascha Gohlke, and Eugen Illenberger	
Formation of C ₆₀ ²⁻ Dianions in Collisions between C ₆₀ ⁻ and Na Atoms	168301
Bo Liu, Preben Hvelplund, Steen Brøndsted Nielsen, and Shigeo Tomita	
Intermittent Self-Organization of Scroll Wave Turbulence in Three-Dimensional Excitable Media	168302
Roman M. Zaritski, Sergey F. Mironov, and Arkady M. Pertsov	
Intermittency and Clustering in a System of Self-Driven Particles	168701
Cristián Huepe and Maximino Aldana	
Errata	
Erratum: Field Expulsion and Reconfiguration in Polaritonic Photonic Crystals [Phys. Rev. Lett. 90 , 196402 (2003)]	169901
Kerwyn Casey Huang, Peter Bienstman, John D. Joannopoulos, Keith A. Nelson, and Shanhui Fan	
Erratum: Saddles in the Energy Landscape: Extensivity and Thermodynamic Formalism [Phys. Rev. Lett. 92 , 035506 (2004)]	169902
M. Scott Shell, Pablo G. Debenedetti, and Athanassios Z. Panagiotopoulos	