

Segregation process in a cluster of cobalt atoms (red spheres) and carbon atoms (blue spheres) as the temperature drops from 2000 K, (a), to 1500 K, (c), showing the migration of the cobalt atoms to the center. See article 275504.

PHYSICAL REVIEW LETTERS

Contents

VOLUME 87, NUMBER 27(I) 31 December 2001

Editorial

Appointment of Reinhardt Schuhmann as New PRL Managing Editor i

General Physics

Storage Ring for Neutral Atoms 270401
J. A. Sauer, M. D. Barrett, and M. S. Chapman

Critical Point of a Weakly Interacting Two-Dimensional Bose Gas 270402
Nikolay Prokof'ev, Oliver Ruebenacker, and Boris Svistunov

Low Energy Collective Modes of a Superfluid Trapped Atomic Fermi Gas 270403
G. M. Bruun and B. R. Mottelson

Using Entanglement Improves the Precision of Quantum Measurements 270404
G. Mauro D'Ariano, Paoloplacido Lo Presti, and Matteo G. A. Paris

Universal Dynamical Control of Quantum Mechanical Decay: Modulation of the Coupling to the Continuum 270405
A. G. Kofman and G. Kurizki

Droplet Nucleation and Domain Wall Motion in a Bounded Interval 270601
Robert S. Maier and D. L. Stein

Molecular Iodine Clock 270801
Jun Ye, Long Sheng Ma, and John L. Hall

Gravitation and Astrophysics

Measurement of the Cosmic-Ray Antiproton-to-Proton Abundance Ratio between 4 and 50 GeV 271101
A. S. Beach, J. J. Beatty, A. Bhattacharyya, C. Bower, S. Coutu, M. A. DuVernois, A. W. Labrador, S. McKee, S. A. Minnick, D. Müller, J. Musser, S. Nutter, M. Schubnell, S. Swordy, G. Tarlé, and A. Tomasch

Asymptotic Normalization Coefficient of ^{8}B from Breakup Reactions and the S_{17} Astrophysical Factor 271102
L. Trache, F. Carstoiu, C. A. Gagliardi, and R. E. Tribble

3D Grazing Collision of Two Black Holes 271103
Miguel Alcubierre, Werner Benger, Bernd Brügmann, Gerd Lanfermann, Lars Nerger, Edward Seidel, and Ryoji Takahashi

Natural Quintessence with Gauge Coupling Unification 271301
A. de la Macorra and C. Stephan-Otto

Elementary Particles and Fields

Manifestation of a Nontrivial Vacuum in Discrete Light-Cone Quantization 271601
Takanori Sugihara and Masa-aki Taniguchi

Search for the Familon via $B^{\pm} \to \pi^{\pm} X^0$, $B^{\pm} \to K^{\pm} X^0$, and $B^0 \to K_S^0 X^0$ Decays 271801
R. Ammar *et al.* (CLEO Collaboration)

(Continued on Third Cover)

PRL 87 (27(I)), 270401–279902, 31 December 2001 (256 total pages)

Copyright 2001 by The American Physical Society

Contents (Continued)

Nuclear Physics

Parity Violation in Proton-Proton Scattering at 221 MeV 272301
A. R. Berdoz, J. Birchall, J. B. Bland, J. D. Bowman, J. R. Campbell, G. H. Coombes, C. A. Davis, A. A. Green, P. W. Green, A. A. Hamian, R. Helmer, S. Kadantsev, Y. Kuznetsov, L. Lee, C. D. P. Levy, R. E. Mischke, S. A. Page, W. D. Ramsay, S. D. Reitzner, T. Ries, G. Roy, A. M. Sekulovich, J. Soukup, G. M. Stinson, T. J. Stocki, V. Sum, N. A. Titov, W. T. H. van Oers, R. J. Woo, S. Zadorozny, and A. N. Zelenski (TRIUMF E497 Collaboration)

Description of the RHIC $p_\perp$ Spectra in a Thermal Model with Expansion 272302
Wojciech Broniowski and Wojciech Florkowski

Atomic, Molecular, and Optical Physics

Time-Resolved Laser Spectroscopy of Multiply Ionized Atoms: Natural Radiative Lifetimes in Ce IV 273001
Z. G. Zhang, S. Svanberg, P. Quinet, P. Palmeri, and E. Biémont

Absolute Measurements and Theoretical Calculations of Photoionization Cross Sections along the Isonuclear Sequence of Multiply Charged Barium Ions 273002
J.-M. Bizau, D. Cubaynes, J.-M. Esteva, F. J. Wuilleumier, C. Blancard, J. Bruneau, J.-P. Champeaux, A. Compant La Fontaine, C. Couillaud, R. Marmoret, C. Rémond, D. Hitz, M. Delaunay, N. Haque, P. C. Deshmukh, H. L. Zhou, and S. T. Manson

Large Nondipole Effects in the Angular Distributions of K-Shell Photoelectrons from Molecular Nitrogen 273003
O. Hemmers, H. Wang, P. Focke, I. A. Sellin, D. W. Lindle, J. C. Arce, J. A. Sheehy, and P. W. Langhoff

Dynamic Imaging of Nuclear Wave Functions with Ultrashort UV Laser Pulses 273004
André D. Bandrauk and Szczepan Chelkowski

Excitation of Rydberg Series in C_{60} 273401
M. Boyle, K. Hoffmann, C. P. Schulz, I. V. Hertel, R. D. Levine, and E. E. B. Campbell

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Observation of Islands of Stability in Soft Wall Atom-Optics Billiards 274101
Ariel Kaplan, Nir Friedman, Mikkel Andersen, and Nir Davidson

Experimental Evidence for Detuning Induced Pattern Selection in Nonlinear Optics 274102
U. Bortolozzo, P. Villoresi, and P. L. Ramazza

Sensitivity to Perturbations of a Time-Reversed Acoustic Wave in a Multiple Scattering Medium 274301
Arnaud Tourin, Arnaud Derode, and Mathias Fink

Perfectly Monodisperse Microbubbling by Capillary Flow Focusing 274501
Alfonso M. Gañán-Calvo and José M. Gordillo

Plasma and Beam Physics

Low-Current, Vertical Blowup in a Stored Laser-Cooled Ion Beam 274801
N. Madsen, P. Bowe, J. S. Nielsen, L. E. Siegfried, and J. S. Hangst

High-Confinement Regime at High β_N Values Due to a Changed Behavior of the Neoclassical Tearing Modes 275001
S. Günter, A. Gude, M. Maraschek, S. Sesnic, H. Zohm, ASDEX Upgrade Team, and D. F. Howell

Electromagnetic Energy Penetration in the Self-Induced Transparency Regime of Relativistic Laser-Plasma Interactions 275002
M. Tushentsov, A. Kim, F. Cattani, D. Anderson, and M. Lisak

Efficient Multi-keV Underdense Laser-Produced Plasma Radiators 275003
C. A. Back, J. Grun, C. Decker, L. J. Suter, J. Davis, O. L. Landen, R. Wallace, W. W. Hsing, J. M. Laming, U. Feldman, M. C. Miller, and C. Wuest

Condensed Matter: Structure, etc.

Effect of Pressure on Statics, Dynamics, and Stability of Multielectron Bubbles 275301
J. Tempere, Isaac F. Silvera, and J. T. Devreese

Quantum Signature of Superfluid Turbulence 275302
D. Kivotides, J. C. Vassilicos, C. F. Barenghi, M. A. I. Khan, and D. C. Samuels

(Continued on Preceding Page)

Experimental and Theoretical Identification of a New High-Pressure TiO_2 Polymorph 275501
Natalia A. Dubrovinskaia, Leonid S. Dubrovinsky, Rajeev Ahuja, Vitaly B. Prokopenko, V. Dmitriev, H.-P. Weber, J. M. Osorio-Guillen, and Börje Johansson
Calculation of a Deuterium Double Shock Hugoniot from *Ab Initio* Simulations 275502
B. Militzer, D. M. Ceperley, J. D. Kress, J. D. Johnson, L. A. Collins, and S. Mazevet
New δ (Distorted-bcc) Titanium to 220 GPa 275503
Yuichi Akahama, Haruki Kawamura, and Tristan Le Bihan
Root-Growth Mechanism for Single-Wall Carbon Nanotubes 275504
J. Gavillet, A. Loiseau, C. Journet, F. Willaime, F. Ducastelle, and J.-C. Charlier
Flexoelectric Surface Switching of Bistable Nematic Devices 275505
Colin Denniston and J. M. Yeomans
Confined Molecules under Shear: From a Microscopic Description to Phenomenology 275506
A. E. Filippov, J. Klafter, and M. Urbakh
Identifying and Indexing Icosahedral Quasicrystals from Powder Diffraction Patterns 275507
Peter J. Lu, Kenneth Deffeyes, Paul J. Steinhardt, and Nan Yao
Origins of Nonstoichiometry and Vacancy Ordering in $Sc_{1-x}\square_xS$ 275508
Gus L. W. Hart and Alex Zunger
Role of Steps and of Terrace Width in Gas-Surface Interaction: $O_2/Ag(410)$ 276101
L. Savio, L. Vattuone, and M. Rocca

Condensed Matter: Electronic Properties, etc.

Chemically Induced Metal-to-Insulator Transition in Au_{55} Clusters: Effect of Stabilizing Ligands on the Electronic Properties of Nanoparticles 276401
H.-G. Boyen, G. Kästle, F. Weigl, P. Ziemann, G. Schmid, M. G. Garnier, and P. Oelhafen
High Level *Ab Initio* Calculations of the Optical Gap of Small Silicon Quantum Dots 276402
C. S. Garoufalis, Aristides D. Zdetsis, and Stefan Grimme
Spectral and Magnetic Properties of α- and γ-Ce from Dynamical Mean-Field Theory and Local Density Approximation 276403
M. B. Zölfl, I. A. Nekrasov, Th. Pruschke, V. I. Anisimov, and J. Keller
Cerium Volume Collapse: Results from the Merger of Dynamical Mean-Field Theory and Local Density Approximation 276404
K. Held, A. K. McMahan, and R. T. Scalettar
Deconfinement Transition and Luttinger to Fermi Liquid Crossover in Quasi-One-Dimensional Systems 276405
S. Biermann, A. Georges, A. Lichtenstein, and T. Giamarchi
Transport and Lifetime Enhancement of Photoexcited Spins in GaAs by Surface Acoustic Waves 276601
T. Sogawa, P. V. Santos, S. K. Zhang, S. Eshlaghi, A. D. Wieck, and K. H. Ploog
Insulator at the Ultrathin Limit: MgO on Ag(001) 276801
Silvia Schintke, Stéphane Messerli, Marina Pivetta, François Patthey, Laurent Libioulle, Massimiliano Stengel, Alessandro De Vita, and Wolf-Dieter Schneider
Quantized Adiabatic Charge Transport in a Carbon Nanotube 276802
V. I. Talyanskii, D. S. Novikov, B. D. Simons, and L. S. Levitov
Counting Statistics for Arbitrary Cycles in Quantum Pumps 276803
Yuriy Makhlin and Alexander D. Mirlin
Optical Properties of *c*-Axis Oriented Superconducting MgB_2 Films 277001
J. J. Tu, G. L. Carr, V. Perebeinos, C. C. Homes, M. Strongin, P. B. Allen, W. N. Kang, Eun-Mi Choi, Hyeong-Jin Kim, and Sung-Ik Lee
Density of States in High-T_c Superconductor Vortices 277002
C. Berthod and B. Giovannini
Disorder Induced Cross-Over Effects at Quantum Critical Points 277201
Enrico Carlon, Péter Lajkó, and Ferenc Iglói
Colossal Effects in Transition Metal Oxides Caused by Intrinsic Inhomogeneities 277202
J. Burgy, M. Mayr, V. Martin-Mayor, A. Moreo, and E. Dagotto
Dynamical Mean-Field Theory of Resonating-Valence-Bond Antiferromagnets 277203
Antoine Georges, Rahul Siddharthan, and Serge Florens

(Continued on Preceding Page)

Near-Field Magnetophotoluminescence Spectroscopy of Composition Fluctuations in InGaAsN 277401
A. M. Mintairov, T. H. Kosel, J. L. Merz, P. A. Blagnov, A. S. Vlasov, V. M. Ustinov, and R. E. Cook
Soft Mode Dynamics above and below the Burns Temperature in the Relaxor $Pb(Mg_{1/3}Nb_{2/3})O_3$ 277601
P. M. Gehring, S. Wakimoto, Z.-G. Ye, and G. Shirane
Electron Spin Relaxation Near a Micron-Size Ferromagnet 277602
B. C. Stipe, H. J. Mamin, C. S. Yannoni, T. D. Stowe, T. W. Kenny, and D. Rugar

Interdisciplinary Physics: Biological Physics, Quantum Information, etc.
Impurity Scattering Induced Entanglement of Ballistic Electrons 277901
A. T. Costa, Jr. and S. Bose
Distinguishability of Bell States 277902
Sibasish Ghosh, Guruprasad Kar, Anirban Roy, Aditi Sen(De), and Ujjwal Sen
Tension-Induced Straightening Transition of Self-Assembled Helical Ribbons 278101
Brice Smith, Yevgeniya V. Zastavker, and George B. Benedek
Dynamic Compartmentalization of Bacteria: Accurate Division in *E. Coli* 278102
Martin Howard, Andrew D. Rutenberg, and Simon de Vet
Simple Theory for the Two-Dimensional Child-Langmuir Law 278301
Y. Y. Lau
Universal Behavior of Load Distribution in Scale-Free Networks 278701
K.-I. Goh, B. Kahng, and D. Kim

Comments
Effect of Substrate Roughness on Wetting and Absorption 279601
D. Bonn, J. Meunier, E. Rolley, R. Bausch, and R. Blossey
Wyatt and Klier reply 279602
Adrian Wyatt and Jürgen Klier

Errata
Erratum: Subsystem Purity as an Enforcer of Entanglement [Phys. Rev. Lett. **87**, 050401 (2001)] 279901
S. Bose, I. Fuentes-Guridi, P. L. Knight, and V. Vedral
Publisher's Note: $\bar{d}$ and $^3\overline{\mathrm{He}}$ Production in $\sqrt{s_{NN}} = 130$ GeV Au + Au Collisions [Phys. Rev. Lett. **87**, 262301 (2001)] 279902
C. Adler *et al*.

AUTHOR INDEX to Volume 87 (Part II) i