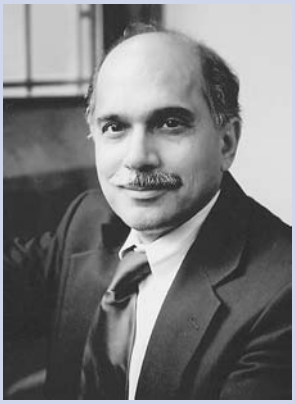
Yale Department of Physics Newsletter

Summer 2007

Greetings from the Chair –



Here is the latest news from your beloved Physics department in New Haven.

Perhaps the most important changes to report since two years ago pertain to new faculty, five of whom joined us last year. Keith Baker, who joined as Professor, is a particle experimentalist who will bring vitality to our ATLAS effort at the Large Hadron Collider in CERN. Keith has taken over leadership of the entire U.S. ATLAS physics analysis support effort. Leonia Glazman, also appointed Professor, is a world class condensed matter theorist whose recruitment is widely held as a coup that will make our group one of the strongest in the world. Steve Lamoreaux, the creative experimentalist who is best known for the first measurement of the Casimir Effect (on a shoe string budget of a few thousand dollars, a fact not shared with the Provost while discussing his startup) also joined as Professor. Karyn Le Hur joined us as Associate Professor and is known for her extensive and imaginative theoretical research in low dimensional and mesoscopic systems. Finally Paul Tipton, co-discoverer of the sixth quark, joined as Professor and will spearhead our ATLAS effort at CERN. The new colleagues have transformed the landscape with everything they bring to teaching, mentoring and research. You will see more on them and our other colleagues elsewhere in this letter.

We have also continued to build bridges to related fields and will have the benefit of Assistant Professors Liz Rhoades (primarily in MB&B, working on protein folding and misfolding), Jill North (primarily in Philosophy with a deep background in Physics, starting with a 1997 Yale BA) and Associate Professor Jerzy Blawzdziewicz (primarily in Mechanical Engineering) who works on soft condensed matter physics. Our joint appointees, like John Wettlaufer in Geology and Geophysics, tend to get very involved in teaching and mentoring our students and these three fit that description perfectly.

As I was writing this letter, I was saddened to hear that Myriam MacDowell, the kind and gracious figure that many of us had the pleasure of knowing, had passed away. Sam has promised to keep teaching his discussion sections and keep himself busy as Emeritus.

This period also saw the departure of two particle experimentalists: Colin Gay left for the University of British Columbia and Homer Neal for SLAC. We wish them the best.

Our able business manager Harley Pretty left us to join Engineering after five years. We are fortunate that the position was taken over by John Fox, who made the transition seamless and continues to give the chairs's office and the department exceptional service. After years of service Jo Ann Bonnet retired as Registrar of Graduate students and her duties have fallen into the capable hands of Sandy Tranquilli, who has contributed mightily, among other things, to the preparation of this letter. Finally Giselle DeVito, the ever popular head Administrator in the Chair's office has decided to move. Fortunately she is moving just to Applied Physics, which means we will remain very much in touch, since the two departments work so closely.

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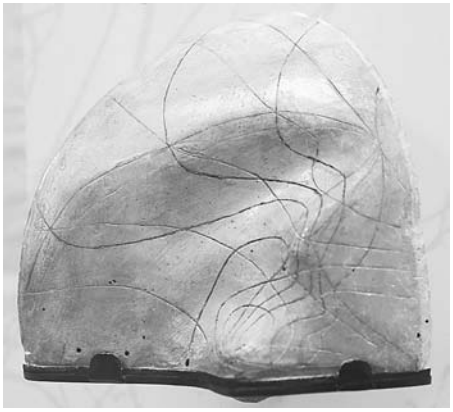
Gibbs

The American Physical Society awarded a plaque to Yale declaring it a Historic Physics site in recognition of the pioneering work done here by one of its all time greats, Josiah Willard Gibbs. The plaque was delivered to Provost Andrew Hamilton by Professor Gene Sprouse, APS Editor-in-Chief in a ceremony that took place on April 20, 2007. Yale's eminent and emeritus historian of science Martin Klein delivered a lecture in Gibbs. Elsewhere in this letter are photos of the plaque and a diorama of some extraordinary Gibbs artifacts, such as his correspondence with luminaries like Lorentz, Michelson, Lord Kelvin and Max Planck and the plaster of Paris model of the Thermodynamic Surface of Water *(below)* handmade by Maxwell as a gift to Gibbs.



YINQE

The Yale Institute for Nanoscience and Quantum Engineering (YINQE) was launched in October 2006 to build on existing research strengths in Yale sciences and engineering, and to broaden interdisciplinary activity among faculty and students across the university. Paul Fleury, Dean of Engineering, has been instrumental in organizing YINQE and will be its first director. Steve Girvin will serve as one of its two deputy directors.

Chair's Message *continued from page 1*

After eight long years of dedicated engagement, Sean Barrett has decided to step down as DUS. He was absolutely central to our curriculum reform, the spectacular growth in enrollment and the peerless mentoring of an army of undergraduates through every conceivable situation. Please see his parting remarks in the adjacent column. Luckily, Peter Parker, who has had years of success in this role will take his place. Likewise, last year Steve Girvin stepped down as DGS after four inspiring years devoted to guiding his charges with care, kindness and vision. Simon Mochrie has taken over and shown that he is completely equal to this very demanding task by doing a brilliant job, starting with what was called the 2-4 Project at Yale that looked into every aspect of graduate education. Please see a section where he reports in more detail. Thanks to the care of such colleagues, the graduate and undergraduate students appear to be thriving, growing in number and achieving excellence in countless ways, as chronicled elsewhere in this newsletter.

When I started the custom of the departmental Teatime ceremony (with high class food and champagne) to mark achievements of members of our community, I had imagined it would be an infrequent event. Instead it broke the bank and all that toasting of victories drove me to drink.

It is with mixed feelings that I write to you this final letter as chair. Effective July 1, 2007, Meg Urry, Israel Munson Professor of Physics, will take over. Meg has the limitless energy, distinction and insight needed to carry on the mission that I initially undertook with some reservations but ended up embracing wholeheartedly. In the process I have grown in many ways (especially around the waist, from numerous recruitment dinners), greatly enjoyed getting to know my colleagues, our extraordinary students and staff, and developed an even greater fondness and pride for this department. I wish Meg all the best and look forward to dodging her assignments in the coming years.

R. Shankar, Chair
J. R. Huffman Professor of Physics

2006 Workshops

Helen Caines organized a workshop on "Strangeness in Collisions" in February 2006 focusing on results from RHIC and SPS. The workshop, jointly funded by Yale and RIKEN, attracted over 40 participants from around the globe.

In July 2006, **Bonnie Fleming** organized a workshop, "Neutrino Physics with Liquid Argon TPCs," that brought international researchers together to discuss R&D efforts.

George Fleming hosted the fourth international workshop on Numerical Analysis and Lattice QCD at Yale in May 2007. This workshop, funded by Yale, the NSF and Jefferson lab, attracted over 40 mathematicians and physicists.

Student News — DUS Report

As Chairman Shankar closes out his term, the undergraduate physics program at Yale is thriving. The Class of 2007 just graduated, with 32 majors (no Physics & Philosophy, one is Math & Physics, and thirty-one are Physics; 37.5% are women). This appears to be the largest number of majors on record, and is a 4-fold increase over the Class of 2002. The surge in student interest in the Yale Physics major (http://www.yaledailynews.com/articles/view/15718) far exceeds enrollment gains nationwide, and seems to be correlated with the changes in the Physics major implemented by our Faculty after the COUP report. One of the successful innovations was the introduction of a "Chairman's Tea", which is a completely optional opportunity for students in the introductory courses (P180/200/260) to attend a roundtable discussion of topics on the Frontiers of Physics. A popular topic every year is an explanation of the most recent Nobel Prize in Physics. This is a fun way increase the contact between students and Faculty outside of the classroom, and it reminds students of the fascinating topics that lay just beyond the reach of the introductory, foundational courses.

Many of Class of 2007 majors were awarded external fellowships, including: Rachel Berkowitz (a BP Institute Fellowship, to attend Cambridge), Jeffrey Thompson (a Fulbright Fellowship, to perform Atomic Physics experiments in Germany for a year before graduate school), Evelyn Tang (a Gates Fellowship, to attend Cambridge), Douglas Swanson (an NSF fellowship, to attend Princeton), and Eleanor Millman (an Honorable Mention from NSF, and will attend Harvard). We are very proud of all of our majors, and are pleased to hear about their successes after they leave Yale…please keep in touch!

I will be rotating out of the DUS position this summer, after 8 years in this role. My supportive wife Nancy deserves credit for my staying power, as she always helped me to put difficult situations into their proper perspective. I greatly appreciate the generous help of my predecessor, Prof. Michael Schmidt, who was always willing to take my calls when I needed advice on what to do. The students and I were also very appreciative of the hard work of our Undergraduate Registrars (Ms. Linda Ford at the beginning of my term, and Ms. Daphne Klemme at the end), who kept the whole operation running smoothly, and who always looked out for the student's best interests.

Sean Barrett, Director of Undergraduate Studies

Two Yale "Drop Teams," groups of five undergraduates in physics, have recently earned the chance to participate in the NASA Microgravity University Reduced Gravity Student Flight Opportunities Program. Co-funded by the Physics Department, the teams have performed experiments on NASA's micro-gravity simulator airplane. The 2006 experiment attempted to examine the ion discharge of a droplet of ethylene glycol when passed through an electric field; in 2007 the team explored the hysteresis of Taylor cone formation.

Faculty News — Recent Appointments

Oliver Keith Baker joined the department in July 2006 as a full professor. He comes to Yale from Hampton University, where he was a University Endowed Professor, and Jefferson Lab, where he held a joint appointment as a staff physicist. He earned his PhD from Stanford and a BS from MIT.

Professor Baker's current area of research is in particle physics at the energy frontier using ATLAS at CERN in Geneva, Switzerland. This research includes such diverse topics as the search for new physical phenomena and a description of the nature of the universe at high energies. In addition, he has done research in the following areas: electromagnetic production of strangeness, multi-TeV pp collider (electroweak) physics, hypernuclear spectroscopy, pseudoscalar meson electroproduction, weak production of strangeness, nuclear effects on atomic physics, rare kaon decays, and novel detector development and construction for particle and nuclear physics experiments.

In 2002 Professor Baker received the Edward A. Bouchet Award of the APS, which recognizes a distinguished minority physicist who has made significant contributions to physics research. Edward Bouchet was the first African-American student to graduate from Yale College and the first in the United States to earn a PhD, in physics and also from Yale.

Leonid Glazman has been hired as a full professor beginning in July 2007. He is currently McKnight Presidential Chair of Theoretical Condensed Matter Physics and director of the William I. Fine Theoretical Physics Institute at the University of Minnesota. He earned his PhD from the Institute of Low Temperature Physics and Engineering of the Academy of Science of the Ukrainian SSR. Among other honors, he was named a fellow of the APS in 1997 and received the Humboldt Research Award for Senior US Scientists in 2000.

Professor Glazman's research interests encompass the following areas of condensed matter theory: the physics of mesoscopic solids (correlated electron tunneling and transport, ballistic conduction, collective excitations, quantum fluctuations of charge and spin) and superconductivity (properties of layered superconductors, including high-Tc materials, and mesoscopic superconductors).

Steve K. Lamoreaux joined the department in July 2006 as a full professor from Los Alamos National Laboratory. He earned his PhD and BS degrees from the University of Washington. He is a fellow of the APS and also the first recipient of the APS Francis M. Pipkin Award in 1999.

Professor Lamoreaux is an experimentalist who conducts research on elementary particles. His research includes tests of fundamental symmetries by use of cold and ultracold neutrons, development of ultracold neutron sources for neutron beta decay measurements, and development of a new experiment to search for the neutron electric dipole moment. He also conducts precision tests of fundamental physical principles with atomic and condensed matter systems and works in quantum cryptography and quantum computing, both theoretical and experimental aspects, with an emphasis on decoherence and signal processing.

Karyn Le Hur joined the department in July 2006 as an associate professor from Sherbrooke University in Canada. She earned her PhD from Orsay (Paris).

Professor Le Hur's research is in condensed matter theory. She studies the emergence of new phenomena at the mesoscopic scale, including Kondo effects in mesoscopic systems, quantum phase transitions, Luttinger liquids, quantum noise, emergence of fractionalization and measurements, and quantum computation. Other interests include unconventional superconductivity and the pseudogap phase, and cold atomic gases.

Paul Tipton joined the department in July 2006 as a full professor from the University of Rochester. He received his PhD from Rochester and his BS from SUNY Binghamton. He is a fellow of the APS.

Professor Tipton's research is in the area of high-energy particle physics. He is part of many collaborations, including ATLAS and RD50 at CERN and CDF at Fermilab. He is universally credited with a leading role in the discovery of the "top quark," one of the six quarks that are the most fundamental building blocks of matter at the subatomic level. This quark had until recently eluded detection because of its unexpectedly large mass (about 200 times the mass of the proton!). It was known to exist on theoretical grounds but its discovery and knowledge of its mass and interactions are crucial to our further understanding fundamental physics. Professor Tipton has a reputation for very subtle data analysis – something for which he is welcomed at the Large Hadron Collider as it gets ready for data taking in 2007.

Graduate Student News — DGS Report

The 2-4 Project

In Fall 2006, the Graduate School asked every department, including Physics, to review and evaluate its PhD program, concentrating on years 2 through 4. This was the 2-4 Project. In Physics, we used this as an opportunity to review and discuss all aspects of our program. A key element of the review was student input. To this end, both the Graduate School and the Physics Department invited responses to questionnaires asking for students' opinions concerning our graduate program.

In addition, draft proposals were discussed at a lively Chairman's Town Meeting with Physics graduate students, and also at a meeting of the Physics faculty, at which the proposed changes were approved by faculty vote. At these separate meetings, it was gratifying that there was broad consensus among the students and faculty about how to modify the Physics PhD program.

Highlights of the approved changes include: the appointment of a core thesis committee in a student's third year, which will mentor and monitor each student's progress more closely than previously, and which will provide written feedback concerning progress from the third year on; the introduction of "pass-out" exams for the core courses, that will determine whether a student has sufficient mastery to be excused from a particular course; a re-working of our course requirements, including, in some cases revising the course content, and in other cases elimination of a particular requirement. Especially popular among students was a change to allow students to carry out experimental research for a semester in the context of a "Special Investigation," instead of taking our otherwise-required graduate laboratory class.

Awards and Accomplishments

2006 and 2007 were banner years for awards and accomplishments by Physics graduate students: David Schuster was awarded the 2007 Dissertation Award of the Northeastern Association of Graduate Schools (NAGS). Mara Baraban was selected to attend the 2007 Meeting of Nobel Laureates in Lindau, Germany. Aaron Mertz was awarded a 2006 Rhodes Scholarship to study at Oxford. For only the second time to a Yale student, Hal Finkel was awarded a 2007 Department of Energy Computational Science Graduate Fellowship. Aaron Mertz (again!!) was awarded an NSF Graduate Research Fellowship, while Stephen Eckel and Hal Finkel (again!!) received Honorable Mentions in the NSF's competition. The 2006 Leigh Page Prize for an incoming graduate student was awarded to Flavius Schackert. Aaron Mertz and Ethan Neil (first-year graduate students) have won Prize Teaching Fellowships from the Graduate School for the 2007-08 academic year. Jedidah Isler, an incoming graduate student in Fall 2007 from Norfolk State University, has been awarded the NASA - Harriett G. Jenkins Predoctoral Fellowship.

Simon Mochrie, Director of Graduate Studies

Entering Grad Students

Fall 2006

Atomic Physics: John Barry (Princeton), Colin Bruzewicz (Williams College), Stephen Eckel (Lehigh University), Andrew Jayich (Harvard), Cheng Yang (Peking University)

Astrophysics: Avanthi Mawathage (University of Peradeniya, Sri Lanka)

Condensed Matter Theory: Joseph Bae (University of Cambridge), Alison Errico (Brown), Michael Kastoryano (Tufts), Peter Orth (Univeristy of Heidelberg), Hasuk Song (Harvard-Radcliffe College), Ivan Stanic (University of Belgrade), Robert Tandy (Kent State)

Condensed Matter Experimental: Emily Chan (MIT), Nicholas Masluk (Lafayette College), Jason Merrill (Amherst College), Matthew Phillips (University of Colorado, Boulder), Flavius Schackert (Ecole Polytechnique, France), Adam Sears (California Institute of Technology)

High Energy Experimental: Benjamin Kaplan (Brandeis), Sarah Lockwitz (Michigan State), Joshua Spitz (University of Colorado, Boulder), Benjamin Wilson (Saskatchewan University)

Nuclear Theoretical: Christopher Gilbreth (University of California, Irvine), Konstantin Nesterov (Moscow Institute of Physics & Technology)

Nuclear Experimental: Aaron Mertz (Washington University, Missouri), Carl Schreck (Bethel College, Minnesota)

Particle Theory: Hal Finkel (Drexel University), Leonardo Motta (Universidade de Sao Paulo)

Other: Peter Koo (University of California, Berkeley)

When the New Haven Coliseum was demolished in January, 2007, Steve Girvin organized a competition to see if students could predict how big an earthquake the implosion would cause. One team of graduate students and one team of undergraduates wrote short papers identifying the physics involved and predicting the magnitude of the quake.

In 2005 the National Science Foundation awarded a six-year, $7.5-million grant to establish a Materials Research Science and Engineering Center at Yale and Southern Connecticut State University, with participation from Brookhaven National Laboratory. The MRSEC research program is highly interdisciplinary, bringing together members of the departments of applied physics, physics, chemistry, chemical engineering, electrical engineering, and mechanical engineering.

Faculty News

Robert Adair was awarded a 2006 William Clyde DeVane Medal, the oldest and highest-ranking award for undergraduate teaching and scholarship at Yale. In his introduction of Adair at the award banquet, Jack Sandweiss noted that Adair taught "almost all subjects in physics, at all levels from introductory classes to graduate specialties. He was especially interested in and challenged by the teaching of modern physical science to students with no special background." Adair is Sterling Professor Emeritus of Physics.

Rick Casten has been elected chair of the Division of Nuclear Physics (DNP) of the APS for 2008. He served as vice-chair in 2006 and is currently chair-elect and chair of the DNP program committee. In 2006 he was also named D. Allan Bromley Professor of Physics.

Richard Chang received the 2005 David Sinclair Award of the American Association for Aerosol Research. The award recognized Professor Chang for his sustained excellence in aerosol research and technology, noting that "inventive, seminal, and very often beautiful are proper adjectives to describe his work."

David DeMille has been awarded the 2007 Francis M. Pipkin award of the American Physical Society. The award is given every two years and recognizes exceptional research accomplishments by a young scientist in the interdisciplinary area of precision measurement and fundamental constants. Professor DeMille was also elected to fellowship in the APS in 2005.

Michel Devoret has received the singular honor of being appointed Professor at the College de France, which requires him to give a series of lectures on Mesoscopic Physics. He gave the Inaugural lecture on May 31, 2007.

Richard Easther's work calculating the gravitational waves that would be generated by the end of inflation after the Big Bang was featured in Science News in February 2007.

Bonnie Fleming has been awarded a five-year CAREER grant from the National Science Foundation, and a Yale Junior Faculty Fellowship for 2007-2008. She reported to the department results from the MiniBooNE neutrino oscillations experiment designed to address a past anomaly (LSND). No evidence was seen of an excess of electron neutrinos in the signal region. Her group also observed the first cosmic ray tracks in a Liquid Argon TPC prototype under development over the last two years.

Steven Furlanetto received the 2006 Robert J. Trumpler Award of the Astronomical Society of the Pacific, given to a recent recipient of the PhD degree whose research is considered unusually important to astronomy.

Steve Girvin has won the 2007 Oliver E. Buckley Prize of the APS, the society's most distinguished award in condensed matter physics. He shares the award with James Eisenstein of Caltech and Allan MacDonald of UT Austin. The citation notes their "fundamental experimental and theoretical research on correlated many-electron states in low dimensional systems." Professor Girvin, the Eugene Higgins Professor of Physics and Applied Physics, was also elected to the National Academy of Sciences in 2006 and as a foreign member of the Royal Swedish Academy in 2007.

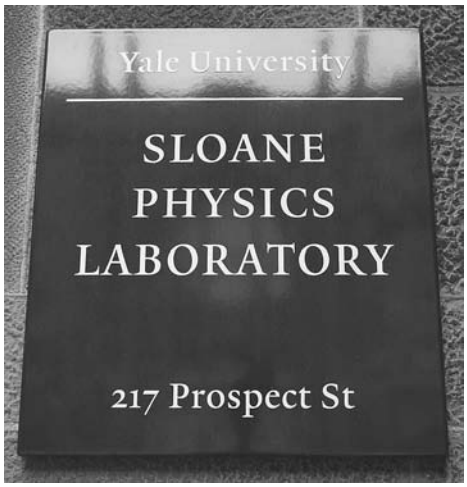
Walter Goldberger has been awarded a 2007 Outstanding Junior Investigator award from the U.S. Department of Energy for his proposal "Investigations in the Field Theories: From Gravity to the Electroweak Scale."

Jack Harris has been awarded a two-year Albert Sloan Foundation Research Fellowship beginning in September 2007. The fellowships support and recognize early-career scientists and scholars with outstanding promise.

John W. Harris, who is a leader in the Relativistic Heavy Ion Collider (RHIC) effort and National Coordinator of ALICE-USA (the CERN sequel), has been lecturing widely on the extraordinary results from RHIC. For example, he gave the the 2007 Hofstadter Memorial Lectures at Stanford. RHIC results have been named AIP Top Story for 2005.

Stephen Irons, a lecturer in the physics department, won a prize from the APS for a physics crossword puzzle.

Dan McKinsey has been awarded a Yale Junior Faculty Fellowship for the 2007-2008 academic year. He presented to the department details of a recent bound on



the search for dark matter by the XENON collaboration, of which he is an essential part. This bound, WIMPS (weakly interacting massive particles), improves previous ones by nearly an order of magnitude.

Homer Neal was named the 2006 recipient of Yale College's Conde Award for teaching excellence in physics, applied physics, and astronomy.

Peter Parker received a 2006 Graduate Mentoring Award from the Yale Graduate School.

Robert Schoelkopf was elected to fellowship in the APS in 2005. The citation notes his innovative use of microwave techniques.

R. Shankar's PHYS 200 (Fundamentals of Physics) is one of seven pilot courses being offered through the Yale Video Lectures Project funded by the Hewlett Foundation. It will be available worldwide in the Fall of 2007.

To mark the 100th anniversary of the publication of Albert Einstein's 1905 paper on the particle properties of light, **Douglas Stone** presented the Yale Engineering Dean's Distinguished Lecture, titled "Genius and Genius^2: Planck, Einstein, and the Birth of Quantum Theory," on November 11, 2005.

Meg Urry's inspiring cover story, "The Secrets of Dark Energy," was featured in Parade Magazine (May 27, 2007), a popular Sunday newspaper supplement that reaches roughly 35 million households. Since 2005 she has chaired the Committee on Astronomy and Astrophysics for the National Academy of Sciences. In 2006 she was elected a fellow of the Association of Women in Science, and in 2007 she was elected a fellow of the Connecticut Academy of Science and Engineering.

Graduate Student Dissertations, Advisors, and Job Placements:

December 2005

Lei Fang, "Shell Model Monte Carlo Methods for Nuclei at Finite Temperature"; Yoram Alhassid;

Alexander A. Karpikov, "Lattice Boltzmann Studies of Turbulence in Non-Newtonian Fluids"; Katepalli Sreenivasan; postdoctoral fellow, Yale University.

Rachel Lewis, "Resonances of Proton Capture on the Isomer of Al-26 in Si-27"; Peter Parker; postdoctoral fellow, University of York, England.

Chun Lin, "A Search for Universal Extra Dimensions in the Multi-Lepton Channel from Proton-Antiproton Collisions at the Tevatron"; Michael Schmidt; Bloomberg L.P., New York.

May 2006

Deseree Meyer, "Nuclear Structure Studies in the Rare Earth and Trans-lead Regions"; Richard Casten; Assistant Professor, Rhodes College, Memphis, Tennessee.

Elizabeth Ricard-McCutchan, "Critical Phase/Shape Transitions in Heavy Nuclei"; Richard Casten; postdoctoral fellow, Yale University.

Jeremy Sage, "Optical Production of Ultracold Polar Molecules"; David DeMille; postdoctoral fellow, National Institute of Standards and Technology.

Sunil Sainis, "Two-color Photoassociation Spectroscopy of the a 3 Sigma U Plus State of Cs 2"; David DeMille; postdoctoral fellow, Yale University.

Sevil Salur, "Investigation of Hadronic Resonances with STAR"; John W. Harris; postdoctoral fellow, Yale University.

Minghao Shen, "Low Temperature Electron-Phonon Interaction in Disordered Metal Thin Films and Applications to Fast, Sensitive sub-Millimeter Photon Sources and Detectors"; Robert Schoelkopf; Advanced Micro Devices, California.

Ruquan Wang, "Approaching Lithium BEC with a Mini Trap"; Mark Kasevich.

December 2006

Zhenyu Han, "A Five-Dimensional Model of Family Unification and Electroweak Constraints on Extensions of the Standard Model"; Witold Skiba; postdoctoral fellow, University of California, Davis.

Anuj Parikh, "Production of 26AI in Oxygen-Neon-Magnesium Novae"; Peter Parker; postdoctoral fellow, Universitat Politecnica Catalunya, Barcelona.

Wan Qian, "A Unified Description of Baryon Form Factors"; Francesco Iachello; researcher, Lehman Brothers, NY, NY.

May 2007

Betty Abelev, "Multi-Strange Baryon Correlations at RHIC"; John W. Harris; postdoctoral fellow; University of Illinois, Chicago Circle Campus.

Hongzhi Cheng, "Theoretical and Computational Studies of Gas Solid-Surface Collision"; John Tully; postdoctoral fellow, Princeton University.

Kevin Koch, " Magnetic Resonance Studies of Susceptibility-Induced Magnetic Perturbation within the Human Brain"; Douglas Rothman; GE Healthcare, Oconomowoc, Wisconsin.

Stephen Powell, "Quantum Phases and Transitions of Many-Body Systems Realized Using Cold Atomic Gases"; Ramamurti Shankar; postdoctoral fellow, Oxford University.

Veronica Savu, "The Light at the End of the Tunnel Junction: Improved Energy Resolution of UV Single-Photon Spectrometers Using Diffusion Engineering", Daniel Prober; postdoctoral researcher; Ecole Polytechnique de Lausanne, Switzerland.

David Schuster, "Circuit Quantum Electrodynamics"; Robert Schoelkopf; postdoctoral fellow, Yale University

Benjamin Turek, "Precision Measurements with the Single Electron Transistor: Noise and Bacaction in the Normal and Superconducting State"; Robert Schoelkopf; Lincoln Laboratories, Lexington, MA.

Mary Vasu, "First Order Perturbation Study of Bianchi III Manifolds: Dust and Radiation"; Vincent Moncrief.

Jun Wang, "Scanning Tunneling Microscopy Study of Surface Nucleation and Thin Film Growth: Semiconductors and Metal Oxides"; Eric Altman; Susquehanna International Group, New York.

Chun Yang, " Measurement of the Bs Lifetime using Semi-Leptonic Decays with the Collider Detector at Fermilab"; Michael Schmidt;

The 9th annual Yale Physics Olympics for high school students will be held October 21, 2007. Fifty teams of high-school students from forty schools in Connecticut, Rhode Island, and New York will compete to design and carry out solutions to a set of five experimental problems. The event has become so popular in recent years that there is now a waiting list for teams interested in participating. The Physics Department and the Howard Hughes Medical Institute sponsor the event.

The governor designed by Josiah Gibbs in his engineering days.

Robert Birgenau '66 PhD was elected to membership in the American Philosophical Society and received the Founders Award from the American Academy of Arts and Sciences in 2006. He is Chancellor of the University of California, Berkeley.

Julius Cahn '42 BA, '48 PhD writes, "I am scheduled to be a judge at the Intel Science and Engineering Fair in Albuquerque in May. I have acquired my first double bass student and am enjoying it immensely. So is he! Lastly, I currently hold the Olympic weight lifting record in the state of New Mexico. Such are the rewards of longevity."

Jia Chen '00 PhD joined IBM after graduation. She started in the Semiconductor R&D Center in 2000 and moved to the Thomas J. Watson Research Center in 2003. Her research focuses on carbon nanotubes and nanoscaled materials-based electronic and optoelectronic devices and technologies. Recently she has found novel methods to drastically improve the electronic properties of high performance carbon nanotube devices, new ways to generate intense light from an ultra-small source, and new methods to self-assemble these materials. In 2005, she was recognized as one of the top 35 technology innovators under the age of 35 by MIT's *Technology Review* magazine and highlighted as the top nanotechnologist. Last year, she was named one of the top fifteen innovators in the second annual Nano 50™ Awards. She was also named Best Small Tech Researcher of the Year by *Small Times* magazine (2006), selected among a group of 80 young engineers by the National Academy of Engineering to attend its annual Frontiers of Engineering Conference, and inducted as a fellow of the World Technology Network in 2006.

Ya-Hui Chiu '79 PhD has since 1989 been working for Asia Satellite Telecommunications, a pan-Asia regional satellite communications company, as the general manager for operations. He is responsible for maintaining and operating the satellite fleet and interfacing with customers' operations and technical needs. He has worked on the teams that design the AsiaSat satellites and also served as the principal technical representative for the satellites' launch, in charge of all technical matters involving the launch vehicle, interface issues with the satellite, and the mission.

Horace Crater '68 PhD is a professor of physics at the University of Tennessee Space Institute in Tullahoma, Tennessee. He sent in the following memorial of his friend and colleague **Peter Van Alstine** ('76 PhD), who died on February 24, 2006. "In his dissertation," Crater writes, "Van Alstine used Dirac's theory of Hamiltonian constraint dynamics on the relativistic two-body problem. Until his successful application of Dirac's formalism, the so-called No-Interaction Theorem seemed to put a barrier to the development of a relativistic canonical formalism of directly interacting particles, one without an intermediary field. He went on to work at Vanderbilt and then held positions at Indiana, Colgate, and finally on the West Coast at Pacific Sierra Eaton, and since 1990 at Northrop Grumman. In work with me, he applied Dirac's Constraint Dynamics to the development of Two-Body Dirac equations, a compatible pair of equations for two relativistic spin-one-half particles and an improvement on the Breit equation developed in 1929 by prominent Yale professor Gregory Breit. Continuing this collaboration throughout his career, Van Alstine applied them to the quark model of mesons and to QED bound states. In his work at Northrop Grumman, he applied methods of theoretical physics in electromagnetic scattering and work helped to improve the low observable (stealth) characteristics of existing and future aircraft." An obituary for Van Alstine appears in the "In Memoriam: Alumni" section of this newsletter.

Patrick Ennis '92 PhD is a managing director of ARCH Venture Partners in Seattle. ARCH is a venture capital firm that specializes in working closely with scientists in academia and national laboratories to form startup companies, taking equations and data in laboratory notebooks and transforming them into commercial enterprises. Most of these enterprises have their roots in basic physics research, encompassing areas such as semiconductors, optics, software, imaging, materials science, and radiation detection.

Chad Fertig '02 PhD writes, "as far as professional news goes, I joined the faculty of the Department of Physics and Astronomy at the University of Georgia in 2005 and am currently setting up a lab in experimental atomic physics to study quantum magnetism in atomic Bose-Einstein condensates. As far as personal news, my wife and I celebrated the birth this March of our first child, our son Paul."

Bill Fickinger '61 PhD was a graduate student of Earl Fowler and Horace Taft, working on a bubble-chamber experiment at the

Brookhaven Cosmotron proton accelerator. After receiving his PhD he continued in high-energy accelerator-based experimental physics at the University of Kentucky, Saclay in France, Vanderbilt, and, since, 1967, at Case Western Reserve University. Following his retirement in 2000, he has become his physics department's *de facto* historian and custodian of its antique instrument collection. In 2005 he published a history of the physics research done at CWRU, starting in the 1830s. Highlights include the stories of the Yale grads who brought science to the Connecticut Western Reserve, the famous Michelson-Morley ether-drift experiment, the pioneering mechanical acoustics analysis work of Dayton Miller, the many contributions to physics by theorist Les Foldy, and the neutrino work of Nobelist Fred Reines. The entire text of the book (along with a link to the instrument collection site) can be found at www.phys.case.edu/history. As an emeritus professor, Fickinger is an officer of the local AAUP, secretary of Cleveland Peace Action, and co-founder of a campus group, Case for Peace.

Aimé Fournier '98 PhD continues as a project scientist at the Institute for Mathematics Applied to Geosciences, National Center for Atmospheric Research, in Boulder, Colorado. His recent research and development topics include instantaneous wavelet energetic transfers in observed atmospheric states, high-order numerical solution of 2D nonlinear advection-diffusion and incompressible Navier-Stokes flows with dynamically adaptive mesh refinement, and a new exact Fourier-series formula for piecewise

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News from alumni *continued from page 7*

polynomials. He also volunteers as a Yale admissions interviewer, a Roche Colorado Regional Science Fair judge, and a Get Out the Vote team leader for the Boulder County Democrats, and he serves on the Town of Nederland Planning Commission and the Mountain Forum for Peace.

Sydney Geltman '48 BS, '52 PhD writes, "My Ph.D. was in 1952 under Professor Henry Margenau. After short stays at the Westinghouse Research Labs and the Applied Physics Lab of Johns Hopkins, I joined the National Bureau of Standards in Washington in 1956. In 1962 our atomic physics group moved out to Boulder to establish the Joint Institute for Laboratory Astrophysics (JILA) in cooperation with the physics department of the University of Colorado. I have been retired for some time now, but am still able to keep up a satisfying program of theoretical research in atomic, molecular, and optical physics.

About four years ago while driving through New Haven I made a short stop at the Sloane Laboratory. A grad student there, Sarah Bickman, a family friend from Boulder, kindly showed me around. Apart from the renovation on the third floor, I found it remarkably unchanged. Much of my grad school time there was spent in the corner office on the first floor, now occupied by Professor DeMille, which then accommodated about 5 or 6 of Professor Margenau's theoretical students."

Daniel Gochberg '98 PhD writes, "I'm still an assistant professor in radiology (with a secondary appointment in physics) at the Vanderbilt University Institute of Imaging Science. Like most physicists working in medicine, I grossly simplify problems, treating tissue as nothing more than liquid and solid protons coupled together. Also, I'm always looking for exceptional grad students and post-docs, even if they have no medical-imaging experience."

Dmitry Green '01 PhD writes, "I'm having a blast as a product manager on credit derivatives at BlackRock Financial, and an even bigger blast with my kids – my daughter just turned one and my son three. I'd love to hear from other alumni who are now in business/finance."

Richard Hatch '81 MPhil is a "deceptionist," or magician. He also writes about the history of magic, translates magic texts from German, and serves an associate editor of *M-U-M*, the monthly magazine of the Society of American Magicians, which featured him in a cover article in March 2007. As a proprietor of H&R Magic Books, Hatch publishes new magic texts and deals in new, used, and rare books (and other media). He also occasionally performs "chamber magic" concerts with his wife, violinist Rosemary Kimura ('81 MusM). Explaining why he left Yale in 1984, he writes, "I tell people I would rather violate the laws of nature than discover them. The truth is, I find it easier."

Stuart Henderson '91 PhD was appointed director of the Research Accelerator Division at the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory. He leads a division of approximately 230 employees and is responsible for the operation and ramp-up in performance of what will be the world's highest-power proton accelerator. Construction of the $1.4B SNS was completed in June 2006. At full operating capability, the SNS will be the world's leading pulsed spallation neutron source, supporting an external user program of 2000 scientists per year.

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IN MEMORIAM: ALUMNI

Frederick C. Alpers '43 MS died on July 26, 2006, in Ridgecrest, California, at the age of 85. He was a physicist for 35 years, most notably working at China Lake. He was an active member of Grace Lutheran Church and loved photography.

Richard G. Bennett '56 PhD died on October 11, 2006, at the age of 74 in Worton, Maryland. He worked at Dupont de Nemours for over 30 years before retiring as vice president of the Polymer Products Division in 1990.

Thomas W. Crane '74 PhD died on May 26, 2006, at the age of 59 in Los Alamos, New Mexico, after a long battle with multiple sclerosis, which led to his early retirement in 1991. He worked briefly at the Los Alamos Meson Physics Facility before beginning work at Los Alamos National Laboratory in 1976. An avid bicyclist, he competed in the annual Los Alamos Triathlon, the Tour de Los Alamos, and the Iron Horse Race in Durango, Colorado, before his progressing disability forced him to forgo physical activities.

Jane B. DeNuzzo '62 MS died on October 23, 2005, in Gainesville, Florida, at the age of 67. After leaving Yale, she earned a degree in computer science at the University of Southern California and a law degree from the Los Angeles School of Law. She was a member of the American Radio Relay League and Trinity United Methodist Church of Gainesville.

James N. Douglas '56 BS, '61 PhD Astronomy died on August 20, 2006, at the age of 71, in Austin, Texas. Honored at the age of 16 by the Ford Foundation, he majored in physics before obtaining a doctorate in astronomy in 1961. After teaching at Yale, he was invited to establish the Radio Astronomy program at the University of Texas, Austin. The UT Radio Astronomy Observatory was built near Marfa, Texas, where most of the earliest research in radio astronomy was conducted. Douglas became a world expert on interferometer-type radio telescopes. After his retirement, he continued to teach overseas. He was an accomplished piano and banjo player.

Gordon F. Hull, Jr. '37 PhD died on July 17, 2006, in Rockport, Massachusetts, at the age of 94. After leaving Yale, he worked at the Bell Telephone Laboratories, where he led many research groups, including ones studying microwave antennas and microwave radar systems. In 1944, he became a professor of physics at Dartmouth College and directed research for the Office of Naval Research, working as a scientific liaison between European and American physicists. He took brief leaves from teaching to work at American embassies in London and Bern, Switzerland. In 1953, he became a consultant for Saunders Associates in New Hampshire and later for MIT Lincoln Labs, where he developed radar systems. After 1963, he began working in optics and lasers as a consultant for various companies. In 1970, he moved to Rockport, where he converted Hull House, a prominent federalist home, into a guesthouse, and participated in local government.

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News from alumni *continued from page 8*

McAllister (Mac) Hull '48 BS, '51 PhD writes, "*Rider of the Pale Horse*, my memoir of work on nuclear weapons, some of which was done in Sloane Laboratory in 1950, has been published by the University of New Mexico Press. I continue to play with string 'theory,' trying to get general relativity to produce the symmetry breaker necessary for mass (since nothing in my life depends on success in this endeavor, I can play all I want). My son, John ('77 BA) has taken a position as chair of the art department at the College of Charleston in South Carolina, so Mary and I will move there this year. I was born, and largely raised, in the South but never absorbed Southern culture, so I'm not sure how I'll be received in this quintessential Southern city."

David Kalinsky '72 PhD designs and builds real-time and embedded computer systems software and trains software developers and designers through his firm, Kalinsky Associates. He writes, "I suppose the latest trend in this stuff is that more and more of my teaching load is shifting to overseas locations such as the UK, Israel, and southern Asia. The stuff I'm doing is a great mix of cutting-edge high-tech and good old-fashioned high-quality classroom teaching."

Stephen Knight '64 PhD is director of the Office of Microelectronics Programs at the National Institute of Standards and Technology, where he manages the National Semiconductor Metrology Program, a $12M effort to help develop advanced metrology technology for the semiconductor industry. He joined NIST after an extensive career with AT&T/Lucent Technologies. He is an elected fellow of the Institute of Electrical and Electronics Engineers and is a member of the American Association for the Advancement of Science and the Materials Research Society. He has been granted nine patents and has written numerous technical articles and co-authored two book chapters.

Kin Seng Lai '98 PhD writes, "I have been graduated from Yale for almost a decade now. Time flies. I still reminisce about the wonderful times I spent in New Haven and its beautiful surroundings. Now back in my home country, Singapore, I have been busy doing research in the area of solid-state lasers in our national laboratory. My first daughter was born in Yale-New Haven Hospital in 1995. Now I have three lovely daughters, and I have promised to bring my wife and them back to Yale one day in the near future."

Michael Lauterbach '77 PhD writes, "My career path has led me to a point where I have become a leading authority (perhaps The Leading Authority) on the types of measurements and analysis that can be made on electronic signals using an instrument called a digital oscilloscope. This spring and summer I will be giving a series of free half-day lectures on the topic 'Advanced Jitter Concepts and Measurements.' All of the locations are in North America, including Austin, Minneapolis, Boston, Denver, Seattle, Toronto, Waterloo, Ottawa, Montreal, Vancouver and Calgary. The target audience is design and test engineers who develop electronic components (at places like Intel, Texas Instruments, AMD) and electronic devices (Dell, HP, Seagate, Motorola). I suspect there are lots of Yale alums who would find this topic interesting."

Rachel Lewis '05 PhD writes, "I'm currently employed as a postdoc by the University of York in the UK and am dividing my time between York and labs around the world (mostly TRIUMF in Vancouver). I've also just gotten back from two months on a silent meditation retreat in California."

Frank Lin '57 BE, '65 PhD writes, "I have retired from the Department of Mathematics and Computer Science of the University of Maryland Eastern Shore as professor emeritus. Since 2002 I have been visiting the Advanced Virtual and Intelligent Computer Center of Chulalongkorn University, Bangkok, Thailand, doing research on tsunami detection and neural networks. I enjoy the sunshine every day."

Raymond McCarthy '48 PhD was awarded the National Medal for Technology in 2004. As R&D director for DuPont, he was the first scientist to recognize the environmental hazard to the earth's ozone layer from the release of chlorofluorocarbon compounds in aerosols and refrigerants. The research program of the International Chemical Society that he organized ultimately resulted in the worldwide ban of these compounds. He was specifically recognized for instituting the research program that yielded environmentally safe replacements.

Elaine Oran '72 PhD is currently the senior scientist for reactive flow physics at the US Naval Research Laboratory. She is responsible for carrying out theoretical and computational research on the fluid and molecular properties of complex dynamic systems. Current research topics include chemically reactive flows, deflagrations and detonations, turbulence, computational science and numerical analysis, high-performance computing and parallel architectures, shocks and shock interactions, rarefied gases, and microfluidics, with applications to combustion, propulsion, astrophysical explosions, and sensor design. In addition, she is an adjunct professor at the University of Michigan, visiting professor at Leeds University, and editor-in-chief of the *AIAA Journal*. She has published over 350 research articles and several books. She is a member of the National Academy of Engineering and a fellow of both the American Physical Society and the American Institute of Aeronautics and Astronautics. In 2006, she received the Achievement Award of the Society of Women Engineers, delivered the Louis Clark Vanuxem Public Lecture at Princeton, and was awarded the degree of Docteur Honoris Causa from the École Centrale de Lyon.

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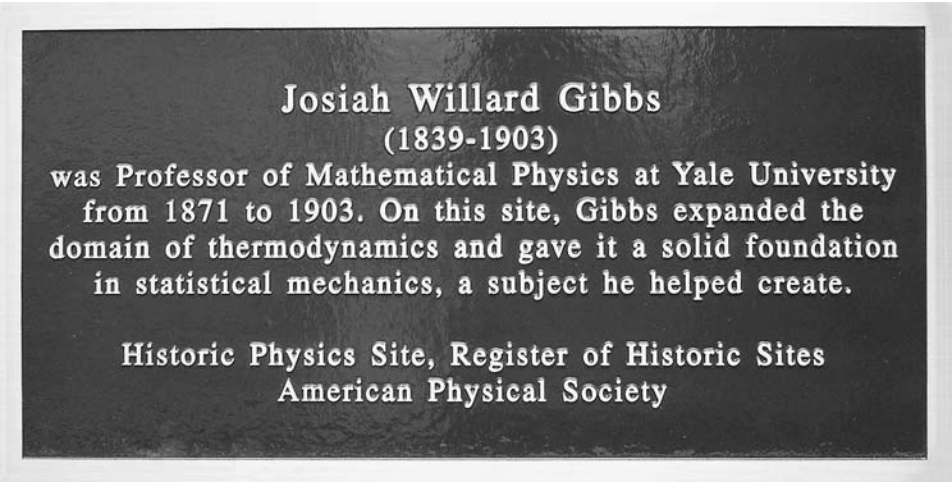

The Gibbs Commemorative Plaque (page 1) will have a permanent home in Jonathan Edwards College when its on-going renovations are completed. JE is built on the site of Gibbs Hall, the original Gibbs Lab.

News from alumni *continued from page 9*

Fabio Peixoto '02 PhD is a financial engineer working with credit derivatives at Bear Stearns.

George Pieper '52 PhD writes, "Last time in this newsletter I asked for responses from people I might have known at Yale. Arthur Quinton replied, but the attempt for us to get together did not materialize. I would like to hear from him again and from any others in that time frame. Life continues in a retirement community in northeast Florida, where I play on the computer and catch large mouth bass in the lake right outside my door. Recently I have had a good time preparing and giving a lecture entitled 'The Big Bang, the Cosmic Background Radiation, and How One of My Guys Won the Nobel Prize.' This comes about because John Mather, who was a co-recipient of the 2006 Nobel Prize in Physics, did the work that won him the prize in my Space and Earth Sciences Directorate at the Goddard Space Flight Center. I am particularly proud of him and the other five members of my directorate who were elected to the National Academy of Sciences."

Stephen Powell '06 PhD writes, "I am spending the spring 2007 semester at the Kavli Insitute for Theoretical Physics at UC Santa Barbara as a graduate fellow. In the fall, I start as a postdoc at Oxford."

Arthur R. Quinton '54 PhD, emeritus professor of physics at the University of Massachusetts, objected to a comment in the last newsletter which referred to former department chairman Gregory Breit as "distinguished but difficult." Quinton writes, "Professor Breit was the intellectual giant of the Yale Physics Department in the 20th century. His contributions are immense and surely rated a Nobel Prize, perhaps when Eugene Wigner was so honored. His students and research associates continued to do fine work after leaving him. Like many others I am eternally grateful for the help he provided me. It was an honor to have known him."

Don Reisler '67 PhD writes, "Well, for the sake of amusement, I will tell you about my activities, since they are probably somewhat out of the mainstream of physics. My wife and I have a business that deals exclusively with old and rare children's books and original illustrative art. We buy and sell at shows, a little bit over the web, and through our print catalogues (which totally run counter to the internet trend that has overrun our industry). My technical skills are used to do research into books, artists, and other historical matters of importance. The detailed computer skills are used to do the scans, photos, layout, color separations, and other issues related to producing an elaborate full-color 96-page catalogue with 650 full-color pictures. I have probably issued about as many catalogues as some of my former classmates have done publications—and perhaps more pages? I have remained close friends with one of my graduate school colleagues, but to reveal the name might destroy a successful career. Now, can you connect the dots to go from philosophical foundations of quantum mechanics to these activities?"

Doug Reiss '72 Grd writes, "I continue to pursue a 22-year career in the Internal Revenue Service, now in the Enterprise Networks Division, Enterprise Computing Center. I work for the National Office in the Network Operations and Support Section in Memphis, Tennessee, where I have been a technical intern, one of seven out of several thousand applicants, since 1999. There is much technology to learn and to keep up with. My last visits to Yale were to attend the Yale Collection of Musical Instruments concerts (1990?) and the J. W. Gibbs Symposium in 1989, where it was memorable to hear Freeman Dyson speak, as great a thrill as hearing P.A.M. Dirac speak to the Physics Club in 1971—packed to the rafters—truly inspirational and a life-time event. I recall my time at Yale as interesting, difficult, challenging, lonely, and politically a field of landmines, not all successfully navigated. I received my Master's degree at SUNY Stony Brook in 1978 and continue my interests in physics and mathematics. I keep a MySpace page on which I discuss environmental and a number of other scientific issues, as well as some personal ones."

Mike Ritter '84 PhD has just started a new job as a technical solutions engineer at Google.

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IN MEMORIAM: ALUMNI *continued from page 8*

Harriet D. Kavanagh '43 MS died on September 21, 2006, in Livingston, New Jersey, at the age of 86. She taught early childhood education at Kean University in the late 1970s and at Squiretown Elementary School in Livingston. She also trained aides in Newark for the Head Start program, a federal program designed to give underprivileged preschoolers the social skills necessary to learn in a school setting.

Dennis P. Malone '60 PhD died on August 5, 2006, at the age of 73, in Buffalo, New York. After leaving Yale, he returned to Buffalo to work at Bell Aircraft and later led the Modern Physics Branch at Cornell Aeronautical Laboratory. In 1965, he joined the faculty at the University of Buffalo, where he served as chairman of the electrical engineering department from 1968 to 1983. Active on campus, he was a chairman of the Intercollegiate Athletics Board and served on the SUNY Faculty Senate. He was fluent in French, German, and Russian.

William W. Mutch '36 PhD died at the age of 101 in Highstown, New Jersey, on February 21, 2006. Upon graduation, he worked briefly for Bell Laboratories to lay the first transatlantic cable. He was a college physics professor for many years and later headed the Nucleonics Division of the Naval Research Laboratory in Washington, DC, before retiring in the early 1970s. He spent his summers in Frankfort, Michigan, where he built a log cabin cottage for his family.

William A. Thornton '52 PhD died in Jackson, New Jersey, on June 1, 2006, at the age of 82. He was responsible for the discovery of the "prime colors" of human vision, a principle for which he received Westinghouse Corporation's highest honor, the Order of Merit, in 1978.

Peter W. Van Alstine '76 PhD died of complications from liver failure on February 24, 2006, in Moorpark, California, at the age of 58. After his Yale studies, he taught at the University of Nebraska, Vanderbilt, Indiana University, and Colgate. He then worked for Pacific-Sierra Research in California. In 1990, he began research on advancements in stealth aircraft for Northrop Grumman, publishing more than 30 papers for scientific journals. A memorial by Horace Crater ('68 PhD) appears in the "Alumni News" section.

News from alumni *continued from page 10*

Timothy Roach '96 PhD writes, "I am an associate professor at Holy Cross in Worcester, Massachusetts, working in several areas, including cold atoms, baseball aerodynamics, and undergraduate education. My family spent the spring of last year in Melbourne, Australia, where I worked at the Centre for Atom Optics and Ultrafast Spectroscopy at Swinburne University, but we are back home now in Cambridge."

Alvin Saperstein '56 PhD is a professor of physics at Wayne State University, where he continues his interests in the interrelationship between science and society as editor of the newsletter of the APS Forum on Physics and Society; through research on chaos theory as it applies to international security; and through active participation on the executive board of the WSU Center for Peace and Conflict Studies. His recent publications include "Teaching Science to Fundamentalists" in Academe and "Chaos in Models of Arms Races and the Initiation of War" in Complexity.

George Stanford '56 PhD writes, "Janet and I still live in Downers Grove, a Chicago suburb, near some of our children and grandchildren. Since retiring from Argonne National Laboratory in 1995, after some 36 years of experimental reactor physics, I have been busy trying to spread the word about the value of arms control and the merits of nuclear power. Authored or co-authored publications include a two-volume historical work (*Nuclear Shadowboxing: Contemporary Threats from Cold-War Weaponry*), a layman's introduction to fast reactors and their potential, an article in the December 2005 *Scientific American* ('A Smarter Use for Nuclear Waste'), a technical explanation of why PUREX reprocessing of used reactor fuel is not a very good idea, and a paper on the theme 'Nuclear Fission Fuel Is Inexhaustible.' They all make good reading, of course, and comments and complaints are welcome."

George Triantaphyllou '93 PhD has recently published a popular-science book, in English and in Greek, titled *The Genesis of Mass: The mystery of the mirror world*.

Charles Tu '72 MPhil Physics, '78 PhD Engineering and Applied Science writes, "I have been a faculty member in the Department of Electrical and Computer Engineering since 1988 and am now an associate dean of the Jacobs School of Engineering at the University of California, San Diego. My research interests include semiconductor quantum-well and quantum-dot structures for electronic and optoelectronic applications, like light-emitting diodes. This year I took charge of COSMOS, a California State summer residential program in math, sciences, and engineering for high-school students. I enjoy the outdoors here, especially scuba diving."

Jeffrey Turk '94 PhD writes, "After completing my PhD with Charlie Baltay, I did a short stint as a postdoc at the University of Wisconsin working with the Aleph collaboration at CERN. Then I took an MA in transition economics at the Central European University in Budapest, Hungary. Upon completion of another doctorate (DPhil) in Contemporary European Studies at the University of Sussex, I took a post as a research fellow with the Scientific Research Centre of the Slovenian Academy of Sciences and Arts in Ljubljana, Slovenia. My work centers on the development of social reality and social science methods as contrasted with the study of the physical world. My background and training in physics at Yale have proved invaluable in my research in the social sciences. I am now stationed in Brussels (my wife works at the Council of the European Union) where I am continuing my research on the development and study of social reality in Europe."

In recent years, the Physics Department has put together a database of alumni who are willing to answer questions that current students might have about career opportunities open to PhDs in physics. If you would like to be included or would like to update your information, please contact Hugh Lippincott, the graduate student in charge of the database, at walter.lippincott@yale.edu. The database can be found at http://research.yale.edu/cgi-bin/physics/physics_db.pl for those who are interested. And don't forget the Yale Career Network, sponsored by the Association of Yale Alumni, a database of alumni in all fields who wish to communicate with other alumni about careers. It offers searches according to industry, company name, job function, or job title or at www.aya.edu/career.

Sukeyasu (Steve) Yamamoto '55 BS, '59 PhD writes, "I'm still working two days a week at RIKEN, the largest interdisciplinary semi-government laboratory in Japan, as the director of a complex of apartments for non-Japanese scientists and families and as an administrative consultant for international relations. I gave up on high-energy physics about seven years ago, having written my last physics paper for the *Physical Review* then. It is nice to be able to put my bilingual and bicultural background to good use. I visited Sloane Physics Laboratory during my fiftieth reunion at Yale in 2005. Much has changed. I stayed with Dan Mann ('58 PhD) last year for my 55th Andover reunion."

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Your comments, suggestions and news are most welcome!

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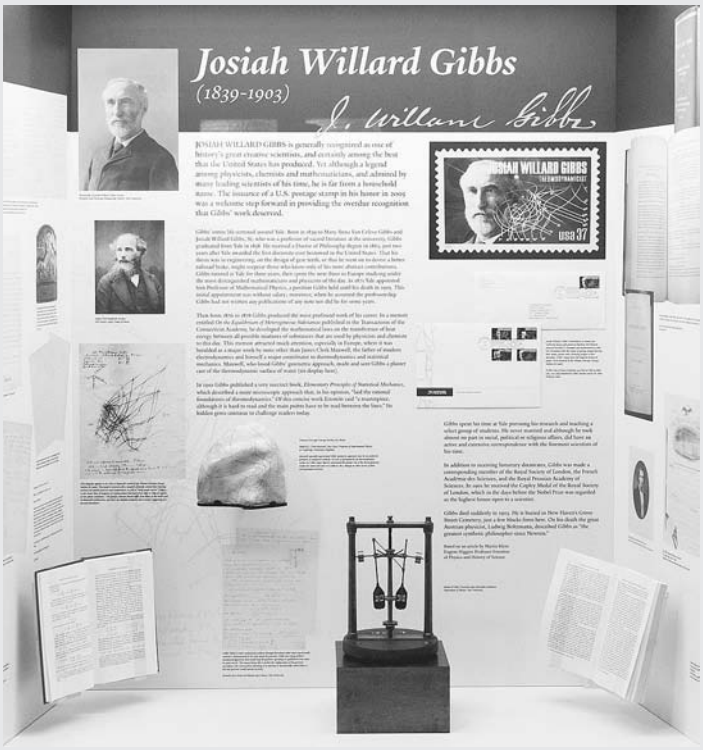

Diorama of Gibbs artifacts whose contents are described on page 1.

Hanan Rosenthal Lectures

Anton Zeilinger, Professor of Physics at the University of Vienna gave the 33rd Hanan Rosenthal Memorial Lecture in October 2006 on "Quantum Measurement: A problem becoming a resource."

Wolfgang Ketterle, John D. MacArthur Professor of Physics and Nobel Laureate at MIT, delivered 32nd Hanan Rosenthal Lecture in December 2005 on "New forms of quantum matter near absolute zero temperature."

Special Departmental Events –

Bromley Symposium

In December 2005, a symposium on the future of nuclear physics brought scientists from around the country to pay tribute to the late D. Allen Bromley. He was the founder and director of the A. W. Wright Nuclear Structure Laboratory at Yale, a chair of the physics department and Dean of Engineering, and a prominent advisor on science and technology to the first President Bush. The proceedings of the symposium were edited by Paul A. Fleury and Francesco Iachello and published as "D. Allen Bromley: Nuclear Scientist and Policy Innovator."

Miller-Breit Lectures

Steven Block, Professor of Physics at Stanford University gave the Miller-Breit Lecture in October 2006. "Breaking the Nanometer Barrier: Recent Progress in Biological Nanoscience."

Leigh Page Prize Lectures

Roger Blandford, Pehong and Adele Chen Director, Kavli Institute of Particle Astrophysics and Cosmology, Luke Blossom Professor of Physics gave three series Leigh Page Prize Lectures in April 2007: "The High Energy Universe", "Introducing GLAST (Gamma-ray Large Area Space Telescope)", and "On the Origin of Cosmic Rays."

Michael E. Peskin, Professor of Physics at Stanford Linear Accelerator Center gave three series of Leigh Page Prize Lectures in April 2006: "Dark Matter: What it is? Where is it? Can we make it in the Lab?, "Supersummetry: The Next Spectroscopy?" and "The Quantitative Analysis of Invisible Particles".

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