



COVER

**Professor David Gross to
be the 2006 Heilborn
Distinguished Lecturer**

PAGE 2

**Graduates
Publications**

PAGE 3

**Recognition
New Addition**

PAGE 4

**Comings & Goings
Public Outreach**

PAGE 5

Holiday Party

PAGE 6-7

Research Awards

PAGE 8

Calendar of Events



2006 HEILBORN DISTINGUISHED LECTURER

The department is pleased to welcome Professor David Gross, professor of physics and director of the Kavli Institute for Theoretical Physics at the University of California, Santa Barbara and last year's Nobel Prize winner in Physics as our 2006 Heilborn Lecturer. He will be a guest of the department May 24th through May 26th and will present a series of lectures entitled:

The Search for a Theory of Fundamental Reality

May 24, 2006

“The Theory of Elementary Particles”

May 25, 2006

“Questions and Speculations”

May 26, 2006

“The Coming Revolutions”

All lectures will take place in L211 at 4:00pm.

David Gross joined the Institute for Theoretical Physics at the University of California, Santa Barbara in January 1997. He received his Ph.D. from the University of California, Berkeley in 1966 and then was a Junior Fellow at Harvard. In 1969 he went to Princeton where he was appointed Professor of Physics in 1972, and later Eugene Higgins Professor of Physics, and Thomas Jones Professor of Mathematical Physics.

Dr. Gross was an Alfred P. Sloan Foundation Fellow (1970-74), was elected Fellow of the American Physical Society in 1974, Fellow of the American Academy of Arts and Sciences in 1985, Member of the National Academy of Sciences in 1986 and Fellow of the American Association for the Advancement of Science in 1987.

He is the recipient of the J. J. Sakurai Prize of the American Physical Society in 1986, a MacArthur Foundation Fellowship Prize in 1987, the Dirac Medal in 1988, the Oscar Klein Medal in 2000 and the Harvey Prize of the Technion in 2000.

Graduates

The department would like to extend its congratulations to the following students who have earned their degrees. Academic success is the reward of work well-applied in not only what tasks are laid before us, but what endeavors we may follow during the course of our education. These students represent the leaders in a difficult field that offers many challenges but also yields great rewards.

DECEMBER GRADUATES

MASTER'S DEGREE

Jonathan Andreasen
Semyon Chaichenets
Jeffrey Klug
Daniel Lascar
Zhengfan Zhang
Yang Zhou

Ph.D.

Joo-Hyoung Lee
Issam Qattan
Nirmala Vasudevan
Su Yan

JUNE GRADUATES

MASTER'S DEGREE

Yanbo Bai
Derek Barge
Sourav Chatterjee
Anastasios Fragkos
Shahin Mani
Milja Medic

Ph.D.

Chunglee Kim
David Lin
Peter Zweber

Publications

A publication was released by members of our department entitled "*Surface Specific Heat of ³He and Andreev Bound States*", **H. Choi, J.P. Davis, J. Pollanen, and W.P. Halperin**, *Physics Rev. Lett.* 96 125301 (2006). The group studied specific heat of liquid ³He in a silver sinter near its superfluid transition temperature with ultra-high resolution, ~10 μ K. Over the pressure range studied, 1-29 bar, the group found a contribution to the specific heat from Andreev bound states near the silver surface. They have determined that these bound states exist within a half of the coherence length of superfluid ³He from the surface. This work provides independent evidence of surface bound states and supports other recent theoretical and experimental work.

Professor Kamal Seth and colleagues published several papers in *Phys. Rev. Letters* and *Phys. Rev.* Four of the most important ones are:

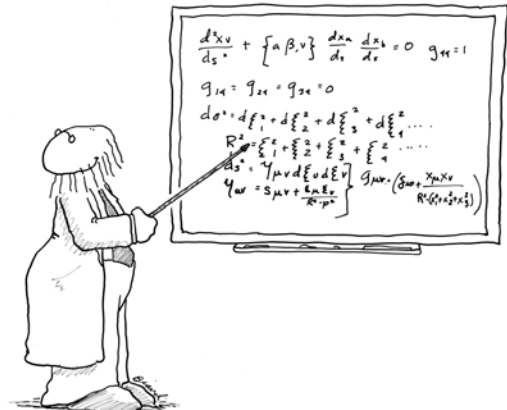
"Precision Measurements of the Timelike Electromagnetic Form Factors of Pion, Kaon, and Proton", *Phys. Rev. Lett.* 95, 261803 (2005).

Based on Peter Zweber's Northwestern Ph. D. dissertation:

"Observation of the hc (1P1) State of Charmonium", *Phys. Rev. Lett.* 95, 102003 (2005).

"Two Photon Width of the Charmonium State Chic2", *Phys. Rev. D* 73, 071101(R) (2006).

"Light Quark Resonances in Pbarp annihilations at 5.2 GeV/c", *Phys. Rev. D* 73, 052009 (2006).



Recognition

Sara A. Solla, Professor of Physiology and of Physics and Astronomy, has been appointed to the Advisory Board of the Kavli Institute for Theoretical Physics (KITP) at the University of California, Santa Barbara. An additional appointment to the Steering Committee has further enhanced this prestigious three-year appointment at the KITP.

Chunglee Kim has been awarded the 2006 Luise Meyer-Schutzmeister Memorial Award by The Association of Women in Science (AWIS) Education Foundation. She is a graduate student in her final year and her dissertation focuses on Merger Rates of Binary Pulsars. She is expected to graduate in May 2006 and will start her postdoctoral studies at Cornell in summer 2006. The Luise Meyer-Schutzmeister Award is given annually to an outstanding woman graduate student in physics. It is awarded for exceptional academic achievement, the importance of research being addressed, the quality of research, and the applicant's potential for future contributions to the field of physics.

Meghan Anzenc was in the news recently; she took part in the Women in Physics group as part of the APS. She was asked to be the representative graduate student from D0 to meet with Department of Energy Secretary Bodman when he visited Fermilab two weeks ago. She has also been chosen to be a participant in the 56th Lindau Meeting of Nobel Laureates and Students in Lindau, Germany. This award is sponsored by the Department of Energy-Office of Science (DOE-SC). The Lindau Meeting will take place June 25-30, 2006. She will be one of approximately 450 students and young researchers in attendance. Meghan's advisor is Dave Buchholz.

A post-doc in the D0 group, **Jon Hayes**, has received a prestigious PPARC fellowship.

Physics graduate student **Paul Cadden-Zimansky** has been awarded a Northwestern Presidential Fellowship for 2006-08. Paul was the only Physical Science grad student to win this fellowship. Let's also congratulate Paul's advisor, Venkat Chandrasekhar.

The department has recently received notification that it has been awarded a three-year, \$380,000 grant by the GAANN program (Graduate Assistance in Areas of National Need) of the Department of Education. The grant provides funding for three fellows per year with a stipend of up to \$30,000 per year depending on financial need. The funding is intended to help the department attract outstanding U.S. graduate students into our program. The grant was written primarily by **David Taylor** and **Mel Ulmer**.

Congratulations to **Mike Smutko** and **Andy Rivers** who have been elected by Northwestern students to receive the 2006 Faculty Honor Roll Award. This is quite an honor, as the students of Northwestern selected these professors themselves and voted for them on a poll. They have made a very big and positive impact on the students of Northwestern, and they will be honored further at an awards banquet.

Jeff Kaplan won the Katherine L. Kriegbaum Scholarship, which is very prestigious and carries a research stipend of \$2k to support his research on the Astroseismology of White Dwarfs.

The department has bestowed the following awards to:

Adrian Jinich: Outstanding Senior Thesis in Physics and Astronomy

Matt Gill: Outstanding Junior in Physics and Astronomy

Tom Lippman: Outstanding Junior in Physics and Astronomy

Gabriel Juarez has been awarded top TA by the Associated Student Government for WCAS.

Congratulations go out to the NEW Officers of the Society of Physics Students

President	Jesse Hall
Vice President	Jeff Chilcote
Secretary	Sarah Braden
Treasurer	Adam Gross
Activities	Andrew Haynie
Web Master	Joe Yelk

New Addition

Congratulations go out to former Ph.D. grad David Marasco who is a proud new parent. Paolo Kree Uptegraft Marasco was born on July 31, 2005 at 5:30pm weighing seven pounds and ten ounces and measuring twenty inches.



Comings & Goings

We warmly welcome the following people to the department...

Dr. Adilson Motter joined us as an Assistant Professor at the start of the spring quarter.

Meena Yust has joined us as the new Program Assistant in the Academic Office.

On behalf of the department we bid a fond farewell to the following people who have left or will be leaving to pursue bigger and better things...

Chunglee Kim will be leaving to begin her first post-doc position at Cornell University.

Casey Law has accepted a job at the University of Amsterdsam working for a new radio telescope project called LOFAR (<http://www.lofar.org>). He will begin work in June but will return in the fall to defend his thesis.

Jasmine Kacar, our former Program Assistant, has left the department to pursue a career in nursing.

Lurleen Flores, our former Department Assistant, has left the department to pursue a career in graphic design and marketing.

Sylwia Walerys-Belczynska will be leaving our department for a web design position at Arizona State University, Herberger College of Fine Arts, in Tempe, AZ.

Peter Zweber defended his Ph. D. dissertation in April, and has accepted a post doc appointment at University of Minnesota

Welcome to our 2006 NASA Summer Research Students

Kyle Beauchamp
 Gaspard Clozel
 Alec Davis
 Steven Elhert
 Julia Fang
 David Freidin
 Alex Godin
 Temple He
 Scott Hollander
 Dane Holte
 Jeffrey Kaplan
 Emerson Speyrerer
 Elizabeth Tang

Public Outreach

One of the goals of the department is to reach out to the public and to hopefully interest them in the sciences. Below are a number of events which our department has put on in hopes of attaining this goal.

On Wednesday, March 22, our department hosted 37 fifth-graders in collaboration with the NCLT for a "Nano Day" from 9:00 to about 1pm. The students viewed demonstrations by our graduate students and Art Schmidt, and constructed an AFM out of LEGOs and scanned a "sample" with this instrument.

Sam Bader of Argonne National Laboratory and Venkat Chandrasekhar organized and sponsored a joint Northwestern/Argonne workshop on Quantum Transport and Magnetism, which took place in Norris Center on March 27 and March 28th.

The Physics and Astronomy Department sponsored an Open House on Sunday, May 21st, to excite middle school students about science. We anticipated ~300 students and parents coming to Tech and Dearborn to see Art Schmidt perform amazing physics tricks, Doug Roberts show 3-D visualizations of the surface of Mars, eat ice cream produced with liquid nitrogen, and try a variety of hands-on physics demonstrations.

Holiday Party 2005



Research Awards Funded October 2005 – May 2006

David A. Buchholz and Heidi M. Schellman

High Energy Experimental Physics Program: Task C
DOE
December 2005 – November 2006
\$478,000

Venkat Chandrasekhar

“NIRT: Atomic Layer Controlled Epitaxial Ferromagnetic Oxide Nanostructures”
NSF
Subcontract: University of Wisconsin
October 2005 – September 2006
\$55,000

“Acquisition of a Field Emission Scanning Electron Microscope for Fabrication of Novel Nanometer-Scale Samples by Electron Beam Lithography”
DOD
April 2006 – March 2007
\$377,960

Pulak Dutta

“In Situ X-Ray Studies of Adsorption, Nucleation and Self-Assembly at Soft-Hard Interfaces”
DOE
November 2005 – October 2006
\$166,468

Arthur J. Freeman

“Energetics, Bonding Mechanism and Electronic Structure of Cermac/Ceramic and Metal/Ceramic Interfaces”
DOE
April 2006 – March 2007
\$85,000

“Fundamental Electronic Structure Characteristics and the Mechanical Behavior of Materials for Aerospace Applications”
AFOSR
October 2005 – September 2006
\$125,000

Bruno Gobbi

High Energy Experimental Physics Program: Task H
DOE
December 2005 – November 2006
\$204,000

Vassiliki Kalogera

“Binary Compact Objects as Gravitational Wave Sources: Modeling and Data Analysis”
NSF
November 2005 – October 2006
\$89,811

“A Chandra Legacy Program: Deep Study of SMXB Populations”
NASA
Subcontract: Smithsonian Astrophysical Observatory
January 2006 – January 2008
\$50,018

“Stellar Sources of Low-Frequency Gravitational Waves (ATP)”
NASA
April 2005 – March 2006
\$45,348

“Discrete X-Ray Source Populations and Star – Formation History in Nearby Galaxies”
NASA
September 2006 – August 2007
\$51,479

John B. Ketterson

“Collaborative Research: collective Mode Spectroscopy in Unconventional Superconductors”
NSF
November 2005 – April 2007
\$125,197

James T. Lauroesch

“Digging for Interstellar Rare Elements in Archival UV Spectra”
NASA
Subcontract: Space Telescope Science Institute
April 2006 – July 2007
\$17,280

Giles Novak

“The Hertz- VPM Polarimeter”
NASA/Goddard
February 2006 – February 2007
\$20,332

“Collaborative Research: Submillimeter Polarimeter with SHARP”
NSF
September 2006 – August 2007
\$30,156

Robert J. Oakes and André de Gouvêa

High Energy Experimental Physics Program: Task F
DOE
December 2005 – November 2006
\$87,000

Frederic A. Rasio

“Dynamic Formation of X-ray Sources in Globular Clusters”
NASA
Subcontract: Smithsonian Astrophysical Observatory
January 2006 – December 2007
\$78,986

“Millisecond Pulsars and Core Collapse in the Globular Cluster”
NASA
Subcontract: Smithsonian Astrophysical Observatory
February 2006 – February 2008
\$38,998

“Stellar Collisions in Dense Star Clusters and Galactic Nuclei”
NASA
May 2005 – May 2006
\$49,917

“Dynamical Formation and Evolution of Compact Binaries”
NSF
August 2006 – July 2009
\$55,000

Michael H. Schmitt

High Energy Experimental Physics Program: Task B
DOE
December 2005 – November 2006
\$172,000

Ralph E. Segel

“Physics with Rare Isotope Beams”
DOE
January 2006 – December 2006
\$55,000

Kamal K. Seth

“Strong Interaction Studies with Medium Energy Probes”
DOE
December 2005 – November 2006
\$300,000

Serhi Shafraniuk

“A Multispectral Detector Based on an Array of Quantum wells formed in Carbon Nanotube”
AFOSR
April 2006 – March 2009
\$212,697

Melville P. Ulmer

GAANN Fellowships for Pure and Applied Research
Department of Education
August 2006 – August 2007
\$126,672

“Low-Cost, Light-Weight, High Stiffness Mirrors”
NASA/Advanced Powder Solutions
January 2006 – December 2006
\$40,000

“Rediscovering the Unseen with Ultraviolet Light (E/PO)”
NASA
January 2006 – June 2006
\$14,930

“Replication Multilayer Optics Development, Phase 1”
Osmic
May 2005 – January 2006
\$6,900

“Studies of GaN-Based films for UV Photocathode”
Goddard
January 2006 – December 2006
\$25,000

Mayda M. Velasco

High Energy Experimental Physics Program: Task K
DOE
December 2005 – November 2006
\$124,000

Kaon Conference 2005

DOE
December 2004 – November 2006
\$10,000

Farhad Yusef-Zadeh

“A Proper Motion Study of the Ionized Gas in the Vicinity of the Galactic Center Black Hole”
NASA/Space Telescope Science Institute
May 2005 - April 2007
\$11,567

“A Large Scale Survey of the Galactic Center at 24 microns”
NASA
October 2005 – May 2008
\$18,234

GBT Student Support Program
NSF/NRAO
February 2006 – September 2006
\$9,000

CALENDAR OF EVENTS

MAY

- 25 Heilborn Lecture
"The Search for a Theory of Fundamental Reality: The Theory of Elementary Particles"
 Prof. David Gross
 Univ. of California
 Santa Barbara
 4:00 p.m. Tech L211

- 26 Colloquium
"The Search for a Theory of Fundamental Reality: The Coming Revolutions"
 Prof. David Gross
 Univ. of California
 Santa Barbara
 4:00 p.m. Tech L211

- 30 Astrophysics Seminar
"Deuteration and Depletion: Tracing the Physical Condition in Cold, Dense ISM"
 Dr. Darek Lis
 Caltech
 4:00 p.m. Dearborn Rm. 23

- 30 WCAS Reading Period begins

JUNE

- 1 Special Seminar
 Prof. Zoltan Oltvai
 University of Pittsburgh

- 5 Spring Quarter examinations begin

- 9 Spring Quarter examinations end 6:00 p.m.

- 16 One Hundred Forty-Eighth Commencement

- 18 Classes for Summer Session begin 8:00 a.m.

JULY

- 4 Independence Day: Legal Holiday, Classes will not be held

- 29 Six-week Summer Session ends 6:00 p.m.

AUGUST

- 12 Eight-week Summer Session ends 6:00 p.m.

SEPTEMBER

- 8 Registration for Fall Quarter 06-07 ends 5:00 p.m.

