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physics

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Message from the Chair

Greetings from Miami University Physics! It has been an eventful two years since our last newsletter. We are very pleased to report that, as a result of the University's Review of Graduate Programs in 2008, the Department's **MS Program was ranked in the top tier of programs at Miami**. This was based upon a combination of student placement, scholarly productivity, and graduate and undergraduate synergy. We were awarded two additional teaching assistantships as a result of our ranking.

In other news, our Department web site was professionally redesigned in the summer of 2008. Please check it out at www.muohio.edu/physics and note the growing Alumni Spotlight section. Early in 2008, the Department was asked to begin plans for relocation to a renovated Kreger, since the proposed Bi-Centennial Student Center will be located at the current site of Culler, Rowan, and Gaskill Halls. A building committee was formed, and following numerous meetings with Physics faculty, staff, students, Physical Facilities personnel, and the architectural design team, we are nearing completion of design phase. Pending state approval of our capital improvement budget, we will be moving into newly renovated facilities in summer 2011.

Following development of a strategic plan in 2008, the Department formed Undergraduate, Graduate, and Staff Development committees, with chairs of those committees, **Jan Yarrison-Rice**, **Samir Bali**, and **Herbert Jaeger** respectively, forming a Chair's Advisory Committee. Recruitment innovations for

both accepted students and younger high school students were introduced this year. For example, we hosted a class (primarily minorities) from Stiver's School for the Arts in Dayton.

As you are probably aware, the economic downturn has impacted the state of Ohio and Miami. The University was forced to eliminate several positions, including our Instrument Maker. We have been able to rehire **Mike Eldridge** part time into that position for next year as a result of generous gifts from alumni and friends. Our goal is to pursue long-term strategies for our Instrument Maker to serve the entire university.

We celebrated with **Herbert Jaeger** his promotion to Professor in 2008, and with **Burcin Bayram** and **Paul Urayama** their tenure and promotion to Associate Professor in 2009 (article inside). **Paul Scholten**, **Chris Church**, and **Doug Marcum** retired in 2008 following many years of faithful service. Chris and Doug plan to teach one semester a year for the next three years. We wish them well

in this new stage of their lives. We welcomed Visiting Assistant Professors **Yuan-jia Hong** and **Longhua Jiang**, to our staff in 2008. We mourn the passing of emeritus professors **Phil Macklin** (March 28, 2008) and **John Snider** (February 19, 2009). These fine gentlemen contributed greatly to the Department and to the Oxford community. They will be missed. We also mourn the passing of benefactor Carol Argus Crannell, BA 1960 (May 10, 2009) Astrophysicist emeritus of NASA-Goddard Space Flight Center.

Our Arfken Scholars-in-Residence were Dr. Joseph Frisch (Stanford Linear Accelerator Center), hosted by **Jeff Clayhold** (2008) and Dr. Eugenia Etkina (Rutgers University), hosted by **Jennifer Blue** (2009). Arfken Scholars (shorter visits) were Gregory Benford (UC Irvine), Richard Peterson (Bethel University, MN), Douglas Hall (Notre Dame), Robert Compton (NIST Gaithersburg), Lois Pollack (Cornell), Robert Beichner (North Carolina State), Johanna Hopp (Wisconsin-Stout), and Brett DePaola (Kansas State).

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Thanks!

The Department is grateful to our former colleague, Don Kelly and his wife Jane, for endowing two new scholarships: the Ray L. Edwards Physics Scholar and the George B. Arfken Physics Scholar. We are also grateful to the Garlands for establishing the James and Carole Garland Scholarship in support of undergraduates majoring in physics.

We are grateful to all our alumni who contribute to our scholarship funds, which include the *Culler Awards*, *Benjamin Lee*, *George and Carolyn Arfken*, *Ray L. Edwards Physics Scholar*, *George B. Arfken Physics Scholar*, *Raymond M. Hughes*, *Ray Lee Edwards*, *Andrew Wolf Bylenga*, *John E. Cocanougher*, *Drake Family*, *William E. Shoupp*, *Carl Frische*, *Philip and Cora Macklin*, *John and Genny Snider*, *James and Carole Garland* and *Votaw Scholarships*.

We also wish to thank all of our alumni who so generously support our general account. These gifts are critical in providing discretionary funds essential to maintaining the vitality of our physics program. If you would like additional information as to how you may further assist the program or students, visit our website at www.muohio.edu/physics and click on the giftbox icon, or contact Evan Lichtenstein, Senior Director of Development at (513) 529-1263 or lichtec@muohio.edu.

Message from the Chair *continued*

The 2008 Benson Lecture entitled, "Stabilizing the Future Greenhouse Earth" was presented by Dr. Gregory Benford (University of California, Irvine) and the 2009 Benson Lecture entitled, "Antimatter: History, Science and Opportunities" was presented by 1957 alumnus Dr. Gerald Smith (Positronics Research, LLC). In conjunction with Miami's bicentennial, we highlighted alumni for our seminar speakers. In addition to Hall ('85), Compton ('01), Hopp ('97), DePaola ('77) and Smith mentioned above, we hosted alumni speakers Ed Caner ('87), Brian Sands ('05), Soo Kim ('03), Dennis Keeler ('95), Dyan McBride ('05), James Clemens ('97), Steve Gertz ('67) and Mike Bait ('90). Bill Houk has also initiated a process of recording the Department's history.

Over the past two academic years Oxford campus Physics faculty taught 52 UG majors courses and 38 graduate courses and taught 95 service courses to 4500 students. Our graduate students taught 130 sections of introductory laboratory courses to 2300 students. We graduated 26 undergraduate majors and 20 graduate students in this same period. Among these students were one Goldwater Scholar, one Goldwater nominee and two Astronaut Scholars. Also during this period, the faculty published 74 papers in peer reviewed journals; made 158 presentations at regional, national and international meetings; submitted 39 proposals requesting more than \$5.6M and were awarded 7 grants totaling in excess of \$2.2M. This research involved more than 30 graduate and 60

undergraduate students (past and present).

Thank you for continuing to support Miami and the Physics Department. Your interaction with students and financial support is an added value that allows us to maintain excellence for those following your path.

To all our valued physics alumni and friends, best wishes for a blessed year.

Mick Pechan

Please note: This will be the last newsletter prepared for a mass mailing. See the mailing label at the back of this newsletter for additional information.

Department News



Paul Urayama

Recently granted tenure and promoted to Associate Professor, **Paul Urayama** received BS degrees in physics (summa cum laude) and the biological sciences (magna cum laude) from the University of California at Irvine

in 1994, and received a PhD in physics from Princeton University in 2001. He joined the Miami physics faculty in 2003.

His current research interests are in the areas of high-pressure bioscience and biotechnology, focusing on in situ fluorescence techniques for piezophysiological investigations. Since coming to Miami, works have appeared in physics, chemistry, and microscopy journals; and he has chaired platform sessions at national and international scientific conferences.

One goal of his research laboratory is to actively involve both undergraduate and graduate students in the discovery process. He is proud of every laboratory member, and the significant and multiple competitive awards, scholarships, and grants awarded to them. He is also grateful for the support of the Department, and his wife Akiko and son Gregory. When he has time, he enjoys writing hard science fiction.



Burçin Bayram

Burçin Bayram has been granted tenure and promoted to Associate Professor. She earned a bachelor's degree from Middle East Technical University, Ankara, and a doctorate from Old Dominion University in 1998. Prior to her appointment at Miami

in fall 2002, she held postdoctoral research fellowship appointments at the University of Michigan in the electrical engineering and physics departments.

Burçin's research interests lie in experimental atomic, molecular and optical physics. Specifically, her experiments focus on the interaction of laser light with atoms and molecules. She investigates the collisional cross section between atoms of the alkali-metal cesium and rare gas using a novel nanosecond pump-probe laser technique. The technique offers significant insights into the energy transfers important to astrophysics, the atmospheric sciences, combustion diagnostics and radiation therapy. Her research has appeared in national and international journals.

Burçin's research has been funded by a Research Corporation Cottrell College Science Award. She is a member of the American Physical Society, Optical Society of America, American Association of Physics Teachers, Association of Women in Science and Advanced Laboratory of Physics Association. She teaches both lower and upper level physics courses for science and non-science majors. Since joining Miami, she has had 9 peer-reviewed papers published

with 4 undergraduate and 8 graduate students as authored/co-authored, and had 14 undergraduate and 7 graduate students. In her free time, she enjoys playing with her triplets Koray, Artun and Melisa, 4.5 yrs old. With her husband, Altug, her family loves dining, and they enjoy visiting King's Island and museums.



Herbert Jaeger

Herbert Jaeger was promoted to the rank of Professor last year. He joined Miami in the fall of 1992, following graduate work at Oregon State University and Max-Planck-Institute for Metals Research at Stuttgart, Germany.

Herbert's research interests lie in three areas: Properties of natural and synthetic zircon; Preparation of thin-film semiconductors by laser ablation; and Laboratory techniques and demonstrations. The paper *Hyperfine Interaction Study of Short Range Order in Zircon* presented at the 2003 Annual Meeting of the American Ceramic Society was awarded the Best Paper Award by the *Nuclear and Environmental Technology Division of the American Ceramic Society in the Science Category*.

Since coming to Miami, Herbert served as Thesis Adviser to five master's degree students, and served as a committee member for six master's students and one doctoral student (Chemistry). His service includes offices held in the American Physical

Department News *continued*

Society, American Association of Physics Teachers, American Ceramics Society, and Sigma Xi, serving as treasurer of the Miami Chapter from 1997-2005. In 2001, Herbert served on the Organizing Committee, was a session chair, and was co-editor for the proceedings of the 12th International Conference on Hyperfine Interactions. Since 2000, Herbert also has been a member of the International Advisory Committee for the International Conference on Hyperfine Interactions. In 2007, he was co-chair for hosting the Fall Meeting of the Ohio-Region Section of the American Physical Society at Miami University. Since 2001, he has been a member of the Miami University Premedical Advisory Committee, and from 1996-2004, served as Adviser for the Society of Physics Students.

Courses Herbert has taught include College Physics, Contemporary Physics Lab, Materials Physics, Thermodynamics, Solid State, and Electronic Instrumentation Lab, as well as Physics for Music. He also developed new laboratory experiments for the Advanced Laboratory Course, which includes

Introduction to Interfacing with LabVIEW, Differential Thermal Analysis (DTA), Characterization of SI and GE PN-Junctions, Thermal Conductivity, Specific Heat, Susceptibility of Rare Earth and Transition Metal Ions, and Preparation of Thin Films by Thermal Evaporation.

With his family along, Herbert spent spring 2009 on Faculty Improvement Leave at the Helmholtz-Institut für Strahlen- und Kernphysik of the Universität Bonn in Germany. In his spare time, he enjoys playing guitar, running, and traveling with his wife, Ellen, and daughters, Rebecca and Maggie.

Janet Hurn has been actively engaged in utilizing updated and online technologies in her courses. She is serving a three-year appointment as Program Chair/President on the board of the Association of Small computer Users in Education. In March 2009, she received a Faculty Innovator Award from the Ohio Board of Regents for her work. She was fortunate enough to be recognized by Governor Strickland, Chancellor Fingerhut, and the Ohio House of Representatives.

Jan Yarrison-Rice was selected as the 2008 Miami Sigma Xi Researcher-of-the Year, for developing a strong, diverse research program in the fabrication and optical characterization of nanoscale materials and devices. She had a three year multinational NSF proposal approved for funding which supports her research into semiconductor nanowires and provides summer support for graduate students. Three undergraduates (Jesse Manders, Caroline Scacca, and Colin Boyle) graduated from the JYR NanoGroup this year and they will be sorely missed.

Jennifer Blue's work was featured in an article at LiveScience.com titled, "Study: Girls Like Science and Math." The link was featured on the home page of Yahoo.com. She was also interviewed about her research on WMUB.

Beverley Taylor was named the winner MU Hamilton Excellence in Service Award. Beverley is the inaugural recipient of this award, which recognized her outstanding contributions to MUH campus life.

Mick Pechan enjoyed teaching sophomore and

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News of our students

Where appropriate the name of the faculty mentor appears in parenthesis

SPS Outstanding Senior Award

2008 – Eric Frey

2009 – Richard Wagner

Outstanding Undergraduate Researchers

2008 – Eric Frey

2009 – Joshua Jasensky and Richard Wagner

College of Arts and Science

Dean's Scholar

2008 – Richard Wagner

2009 – Luke Keltner and Lauren Regueyra

Undergraduate Summer

Scholars

2008

Richard Wagner (Bali and Clemens)

Brian Simpson (Bayram)

Tyler Brest (Eid)

Josh Jasensky (Urayama)

2009

Peter Harnish (Bali)

Luke Keltner (Rice)

Lauren Regueyra (Urayama)

Jordan Ryan (Urayama)

Student Summer Internships

NIST –

2008 – Jesse Manders;

2009 – Ryan Bratton,

Megan Marshall, Grant Riley

Research in Australia –

2008 – Colin Boyle

Undergraduate Research Awards

2008

Jacob Meyer (Pechan)

Colin Boyle, Jesse Manders, Caroline

Scacca (Yarrison-Rice)

Special Awards

2008 Sigma Xi Researcher of the Year –

Jan Yarrison-Rice

2008 Dayton Institute of Navigation –

Jon Schueger

Sigma Pi Sigma Inductees

2008

Matt Briel

Siwei Cao

Hector de Pedro

Josh Jasensky

Scott Keller

Ryan Perhala

Nathan St. John

Richard Wagner

2009

Joshua Ebel

Luke Keltner

Jesse Manders

Lauren Regueyra

Robert Tolley

Patrick Hemphill

Noah Opondo

Nathan Souther

Habtom Woldekristos

Outstanding Graduate Student Research Award

2008 – Hector Michael de Pedro

2009 – Sarah Hernandez

AAPT Outstanding Graduate Student Teacher Award

2008 – Jennifer Mantini,

Jeremy Hohertz, Tiandan Wu

2009 – Patrick Hemphill,

Adam Hicks

Department Scholarship Recipients

2008

Joshua Ebel

Michael McLaughlin

Cody Moorefield

Ryan Perhala

Christopher Schwartz

Daniel Wentzel

Luke Keltner

Ryan Bratton

Jonathan Ehrman

Peter Harnish

Gregory Margolis

Megan Marshall

Robert Misconin

Connor Nobert

Lauren Regueyra

Jordan Ryan

Jacob Scherger

Andrew Hesselbrock

Joshua Jasensky

Jesse Manders

Matthew Briel

Bryan Sympton

Richard Wagner

Katelyn Holub

Dirk Long

Grant Riley

Sally Watkins

2009

Justin Guenther

Andrew Hesselbrock

Christopher Burnett

Jacob Martin

Robert Misconin

John Camenisch

Walter Crosby

Alexis Denton

Peter Harnish

Luke Keltner

Jeffrey Kleykamp

Gregory Margolis

Erin Middlemas

Joyce Mundstock

Stephen Neff

Tyler Perry

Grant Riley

Cathalee Soergel

Jonathan Ehman

Robert Tolley

Corey McDonald

Daniel Wentzel

Matthew Ciccone

Joshua Ebel

Donald Kane

Neal Schick

Megan Marshall

Jordan Ryan

Lauren Regueyra

Degree Awards

2007/08

Physics MS:

Sandipan Basu (Alexander)

Siwei Cao (Yarrison-Rice)

Jeremy Hohertz (Alexander)

Prakash Koirala (Bayram)

Jennifer Mantini (Church)

Hector Michael de Pedro (Urayama)

Tiandan Wu (Alexander)

Physics BS:

Felipe Andrade

Tiffani Casper

Eric Frey

Physics BA:

Aaron Godfrey

Nathan St. John

Adam Maple

Todd VanWoerkom

Engineering Physics BS:

Matthew Laroche

Marc Le Roux

Scott Keller

Michael Maffett

Robert Russell

George Schnell

Adam Combs

Daniel Horne

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senior/graduate electronics this past year. He directed undergraduate research of Jake Mayer and Corey McDonald, and MS theses of Kyle Bechtel, and Sarah Hernandez. He published nine journal articles, gave invited talks at OSU and Los Alamos, and continued funding from US DOE (nanoscale magnetism). Mick also serves as an officer in the APS topical group GMAG.

This year, **Samir Bali's** group observed sub-natural-linewidth spectral features arising from AC Stark shifts in light emitted by ten microKelvin atoms, and did a first systematic analysis. They also observed electromagnetically induced transparency and absorption in atomic vapor with unprecedented signal-to-noise. Finally, they built an advanced teaching lab using home-built frequency-tunable laser-diode systems.

Paul Scholten, emeritus, was awarded the Howard Maxwell Award from the Ohio Section of the American Physical Society. The Howard Maxwell Award for Distinguished Service is presented to those members of the Section who have rendered outstanding service to the Section.

News of our students *continued*

Degree Awards

2008/09

Physics MS:

Nick Selan (Alexander)
Jon Schuerger (Garmatyuk, EGR)

August 2009 graduation planned
Kyle Bechtel (Pechan)
Mohammed Junaid Farooqi (Urayama)
Patrick Hemphill (Clemens)
Sarah Hernandez (Pechan)
Adam Hicks (Blue)
Jeff Hyde (Rice)
Hiromi Maeta (Bali)
Noah Opondo (Eid)
Erich See (Yarrison-Rice)
Nathan Souther (Bali)
Habtom Woldekristos (Rice)

Physics BS:

Colin Boyle
Matt Briel
Zach Callahan
Jacob Cohen
Josh Jasensky
Ryan Perhala
Denis Pleimling
Richard Wagner

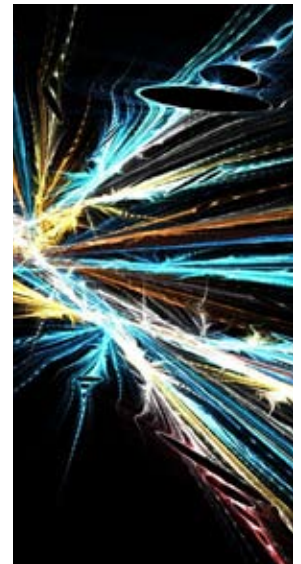
Physics BA:

Caroline Scacca

Engineering Physics BS:

Herbert Saxon
Daniel Schwind
Brian Casto
Dirk Long
Jesse Manders

Please note: This will be the last newsletter prepared for a mass mailing. This information is presented in a timely manner on our website at www.muohio.edu/physics in News & Events. Older information is available in News Archives. We will email the annual newsletter beginning in 2010. To receive it, be sure that we have your current email on file. If you wish to continue receiving the newsletter in print, please let us know and we will accommodate you.



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