

A publication for alumni, friends, faculty, and staff of the MSM-UMR Physics Department

Vojta Named Cottrell Scholar

Professor **Thomas Vojta** has been named a Cottrell Scholar of Research Corporation. This honor carries a monetary award of \$100,000 to further the research and teaching of the Scholar.

Research Corporation is one of the oldest private foundations in the United States. It was founded in 1912 by **Frederick Gardner Cottrell**, scientist, inventor, and philanthropist to provide means for scientific research and experimentation at scholarly institutions. The Cottrell Scholars program, instituted in 1993, owes its origins to Research Corporation's concern with the separation of teaching and research in universities. The Cottrell Scholar Awards are among the most prestigious fellowships for beginning faculty in the sciences; they require and recognize excellence in both teaching and research.

In last year's competition, 136 proposals were submitted, and only 13 awards were made. Vojta's proposal "Disordered electronic quantum phase transitions and an interactive approach to teaching computational physics" was among the 13 successful ones.

Vojta is using the award to expand his research into the low-temperature properties of magnetic and superconducting materials. Together with postdoc **José Hoyos**, graduate students **Chetan Kotabage** and **Man Young Lee**, as well as undergraduates **Shellie Huether**, **Kevin Johnson**, and **Ryan Kinney**, he investigates quantum phase transitions. These transitions occur at extremely low temperatures when a parameter like pressure, magnetic field or chemical composition is changed. In the vicinity of these transitions, strange new phases of matter arise, including exotic superconductors and glass-like magnetic phases, the so-called spin glasses. Vojta tries to understand the origins and properties of these phase transitions and, specifically, how they are influenced by impurities and defects that occur in all real materials.

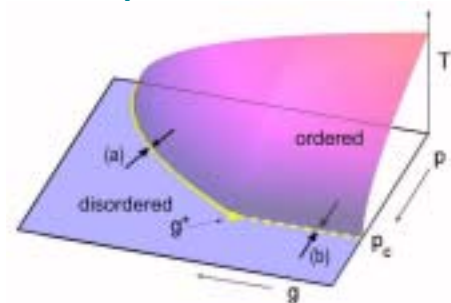
This research has been very fruitful; over the last two years, Vojta has published 13 refereed publications, 7 of which were coauthored with UMR students. Three of these papers appeared in the prestigious *Physical Review Letters* and one was an invited review article for *Reviews of Modern Physics*.

Vojta is also continuing to develop his project-based Computational Physics course. In this class, upper level undergraduates and beginning graduate students gain hands-on experience in solving physics problems by computer simulation. This course has been very well received, with several students commenting that it was the most informative course they had taken.



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Phase diagram of a quantum magnet with random impurities; (a) and (b) are quantum phase transitions.

Memo from the Chair

Greetings from the MSM-UMR Physics Department! We hope you look forward to the annual copy of **Matter 'n Motion** that we send out, as much as we enjoy telling you what has been happening in the department and on the UMR campus over the previous year. We are also very grateful to those of you who have shared information with us about what has been going on in your life and career, and we know that many of the people who graduated with you enjoy hearing about the things that you have been doing since you left Rolla. Year after year, I continue to be impressed with the significant achievements of our alumni, with the high quality of the people who have passed through our program, and with the continuing quality of the students we are able to attract to the department. It is a reflection, we hope, of the great things that we can expect from our current crop of budding young physicists.

This year has been a great one for the department, and it's a pleasure to acknowledge some of the terrific things that have occurred since the last issue of this newsletter. In particular, I am happy to note that individual members of the Physics Department continue to receive recognition for the quality of the research and educational activities in which they are engaged. Elsewhere in this edition of **Matter 'n Motion** you will read that Assistant Professor of Physics **Thomas Vojta** was named a Cottrell Scholar by the Research Corporation. This award, and the NSF CAREER award that he won last year, carries with it significant funding for his research program in quantum phase transitions, and is an acknowledgement of the leadership role that Thomas plays in this rapidly growing area of physics. Thomas also won a UMR faculty excellence award this year in recognition of the quality of both his research and his teaching activities.

The Physics Department is also extremely proud of the fact that in the past year not just one, but two of its faculty members received the highest possible University recognition for their accomplishments in research and teaching. **Michael Schulz** was appointed at winter commencement to the rank of **Curators' Professor of Physics** in recognition of the continuing excellence and productivity of the research program in Atomic and Molecular Physics that he has maintained since arriving at UMR in 1990. Also at winter commencement, **Allan Pringle** was appointed to the rank of **Curators' Teaching Professor** for his excellence in teaching and for the tireless role that he has played in promoting science education in the state of Missouri. There is not a week of the semester that goes by that Allan is not off to a K-12 school somewhere in the state giving a science presentation (one that usually includes freezing various objects in liquid nitrogen and smashing them on the schoolroom furniture). Allan was also given an award this year by STOM, the science teachers of Missouri, and, as we go to press, I have just received notice that Allan will be receiving the Missouri Governor's Award for Excellence in Education. I expect that we'll have more to tell you

about that in the next issue of **Matter 'n Motion**. It is perhaps worth noting, also, that the UMR campus typically awards at most one Curators' Professor and one Curators' Teaching Professor each year, and in many recent years there have been no recipients for this honor at all. This is the first time in UMR history that two members of the same department have received the honor in the same year, a fact which I think speaks to the quality of the faculty that we continue to attract and develop, and to the importance that the department places on both the educational and research missions with which it is charged.



Along with these very prestigious awards, three Physics faculty, Allan again, along with **Greg Story** and **Ron Bieniek**, received UMR Outstanding Teaching Awards for the quality of their teaching, and Thomas Vojta and Assistant Professor **Max Bertino** received UMR Faculty Excellence Awards for their teaching and research activities. The department congratulates all of them on their commitment to excellence.

The department is also pleased to welcome to its ranks two new members: Dr. **Julia Medvedeva**, a condensed matter physicist who specializes in first principles electronic structure calculations of technologically important materials and Dr. **Alexey Yamilov**, a theorist who works in the area of photonics and electromagnetic wave propagation in disordered materials. Both joined the department in the Fall of 2005 and are busy doing all the things that new faculty members do. It is a pleasure to welcome them to the department and we look forward to bringing you a report of their research and teaching activities in future issues.

Of course, the pleasure of welcoming new friends and members of the department serves to make even more poignant the sadness with which we say goodbye to old friends. The department was deeply saddened to learn of the death last spring of Emeritus Professor of Physics **Richard Anderson**, in Washington State, where he had moved with his wife **Mary** to be closer to their family. Before the move it was always a joy to talk with Dick whenever he visited the department, typically carrying a bag of candy that he would bring to every office in the building offering a little afternoon treat. I still have a few pieces of Dick's candy in my desk drawer, where I keep them as a reminder of a great friend to the department. Dick will be missed. The department is extremely grateful to Dick's wife, Mary, who has endowed a new Physics Department Scholarship that will allow us to honor his memory for years to come. – *Paul Parris*.

Physics Department Awards 2005-2006 Scholarships and Fellowships

The following scholarships have been endowed through the generous gifts of the friends of the UMR Physics Department. Please contact the Physics Department if you would like to add to the endowment fund of these scholarships or would like to establish a new one.

Recipients of the *Harold Q Fuller Scholarship-Loan* were **Ryan Kinney** of Gladstone, Missouri, and **Michael Hoffman** of Russellville, Missouri. The \$1,300 scholarship-loan was endowed by the late Dr. **Harold Q Fuller**, chair of the physics department from 1948 to 1970 and former Dean of the College of Arts and Sciences, to recognize outstanding achievements among juniors and seniors in physics. One quarter of the scholarship is an interest-free loan that students begin to repay when they start their first jobs.

The recipient of the *Burke H. Miller Memorial Scholarship* was **Joshua Carey** of Fredricktown, Missouri. This \$1000 endowed scholarship was established by the Miller family to commemorate the academic achievements of their son, Burke, who graduated with a bachelor's degree in physics in 1969 and later died during the Vietnam War. The award is for promising and dedicated students in physics.

Zachary Stegen, of St. Peters, Missouri, was awarded the \$1000 *Ed and Mary Sue Sickafus Endowed Scholarship/Fellowship*, established by **Ed** (BS '55, MS '56) and **Mary Sue Sickafus** in conjunction with the Ford Motor Company and awarded to physics students on the basis of their performance at UMR.

The *Richard W. Hannum Endowed Development Fund* was established through a bequest by **Richard Hannum** (PhD '66). The fund is currently used to provide scholarships for outstanding students in Physics. **Charles Williams**, of St. Louis, Missouri, received the \$600 Hannum Scholarship for 2005-2006.

Clayton Weidinger of Vienna, Missouri, **Samuel Woods** of Smithville, Missouri, and **Kevin Johnson** of West Plains, Missouri received the *Leon E. Woodman Memorial Scholarship*. This scholarship was established by the Woodman family in honor of Dr. **L. E. Woodman**, Chair of the Physics Department from 1919 to 1948. It is offered to students in physics who are of good moral character, maintain a satisfactory grade point average, and are in financial need.

In addition to endowed scholarships, which are usually awarded to juniors and seniors, the department awards special *Physics Department Scholarships*, funded from the annual phonathon, to students who earn a grade point average of 3.5 or higher. This past year, department scholarships ranging from \$500 to \$1000 were awarded to **Benjamin Bethge**, of St. Louis, Missouri, **Shellie Huether**, of St. Louis, Missouri, **Ryan Hupe** of Troy, Missouri, **Kevin Johnson** of West Plains, Missouri, **Lane Martin**, of Rogersville, Missouri, **Lauren Rich**, of St. Joseph, Missouri, **Dustin Spieker**, of Shawnee, Kansas, **Zechariah Thrailkill**, of St. Charles, Missouri, **Christopher Van de Riet**, of Eureka, Missouri, and **Andrew Walters** of Omaha, Nebraska.

Finally, *Robert T. Hufft Freshman Scholarships* ranging from \$500 to \$1000 were awarded to **Lucas Seiden**, of Overland Park, Kansas, **Mark Herrera**, of Kansas City, Missouri, **Timothy Gross**, of O'Fallon, Missouri, **Ryan Ohs**, of Lincoln, Nebraska, **Seth Cunningham** of St. Peters, Missouri, **Jake Walker** of Kansas City, Missouri, **Tara Biggers** of Marshfield, Missouri, **David Kimzey** of Arnold, Missouri, **Joshua Whitaker** of Kansas City, Missouri, **Lori Kennedy** of Belleville, Illinois, **Emily Holden** of St. Charles, Missouri, **Ciaran Ryan-Anderson** of Ellsinore, Missouri, **Michael Pyles** of Kansas City, Missouri, and **Samuel Petersen** of Rolla, Missouri.

Endowments: Gifts that Keep on Giving

Through the generosity of friends and alumni, the Department of Physics has been very successful in raising annual support for scholarships, student travel funds, and program enrichment. As you make your annual commitment to the department, however, you might want to consider starting an endowment in your name or in the name of a loved one, so that your gift will still be making a difference when your great-grandchildren enroll at UMR. An endowment to the university will bear the name that you designate *in perpetuity*.

Consider the impact of leaving an endowed scholarship or lecture series in your name. With an initial gift of \$10,000 (which may be started with \$2,000 and a pledge of \$2,000 annually over the next five years) you can start a fund from which generations of students will benefit. The fund will generate approximately \$500 per year initially,

and will continue to grow as the principal increases each year. The UMR physics department has several donors that have been adding to their endowment for several years, including endowments recently established by **Ed** and **Mary Sue Sickafus**, and by the estate of **Richard Hannum**.

Endowments may be established with cash or readily marketable securities. Regardless of the amount of the endowment you wish to establish or the methods used to establish it, your investment will have a significant and long-term impact on the Physics Department and on the University of Missouri-Rolla. Please call **Joanne Zap** at 1-800-392-4112 or e-mail her at jzap@umr.edu if you have any questions or wish to discuss options available to you for giving to the department.

Report from the SPS

From Ryan Kinney, President of SPS

After a quiet year SPS is going all-out to get members more involved. We are focusing on convincing more physics majors to apply for REU's (Research Experience for Undergraduates) all around the country. We plan to be more active during PRO (Preview, Registration, Orientation) days for entering freshmen, and are making a new SPS poster to publicize our activities. We are inviting more professors to our meetings, helping welcome our new faculty to the department, and encouraging our members to do more research and talk about their work both on campus and at scientific meetings.

We are thinking about a float trip, and plan to have a booth at the annual Block Party on State Street in April, selling our favorite treat, liquid nitrogen ice cream. SPS is putting together a physics student survival guide, which will detail everything physics majors need to know but aren't told about campus and the department. We will be updating our web site, so visit us on the web at <http://web.umar.edu/~sps/>. Our world-famous Hollywood Squares T-shirt is back, along with our regular T-shirts. We are even cleaning out the SPS room.

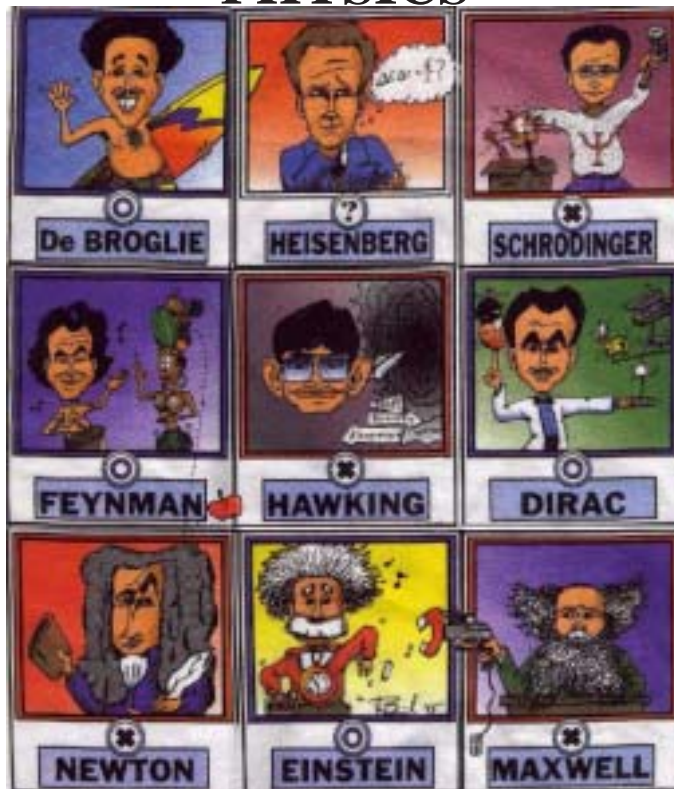
SPS is experiencing a revival!

Dan Waddill Promoted

Dr. Dan Waddill was promoted to Professor of Physics in 2005. Dr. Waddill received a BA in physics from Rice University in 1980, and MS and PhD degrees from Indiana University in 1984 and 1987 respectively. Waddill joined the UMR Physics Department in 1994 after postdocs at the University of Minnesota and Lawrence Livermore National Laboratory. While at UMR Dr. Waddill has received 5 Faculty Excellence Awards, a College of Arts & Sciences Excellence in Teaching Award, and 2 Teaching Effectiveness Commendations.

Dr. Waddill's research focuses on the use of unique polarized photon and electron spectroscopies to probe relationships between structure and magnetism in thin film magnetic materials and to study electron correlation in complex systems. His work has been supported by the National Science Foundation, the Department of Energy, the Air Force Office of Scientific Research, the Army Research Office, the Office of Naval Research, and Lawrence Livermore National Laboratory. Dr. Waddill has also been active as a member of the Magnetic Interface and Nanostructures Division of the American Vacuum Society serving as Treasurer in 2002 and 2003, as Chair-elect in 2004, and as Chair in 2005.

PHYSICS



IT'S HIP TO BE SQUARE

UMR SPS T-shirt. Above is the back of the Hollywood Squares T-shirt, commissioned exclusively for UMR SPS in 1996. If you would like to order a t-shirt, contact the SPS faculty advisor, Dr. Allan Pringle, by e-mail at pringle@umar.edu. T-shirts are \$10.00 for SPS members, \$15.00 for non-SPS members.

Physics Scholarship for Academic Access

This past year, the department was pleased to endow a major new scholarship, funded by donations from seven physics faculty members who matched a major gift made by a generous physics alumnus. Their \$15,000 donation was matched by the University of Missouri System, providing a \$30,000 endowment for need-based scholarships. The Physics Department is grateful to all who made this scholarship possible.

New Physics Faculty:

Julia Medvedeva

Julia Medvedeva was born and grew up in Ekaterinburg, Russia. The city is located in the Ural mountains, right on the boundary between Europe and Asia. It is famous for two historical events: Tsar Nicolas II was killed there and, ironically, the first president, Boris Yeltsin, was born there. The city was founded as a factory fortress in 1723 by Tsar Peter the Great who named it after his wife, Catherine. In the 1800's it was the gold and gem-mining center of the Urals and Siberia, and later it became one of Russia's largest industrial and scientific cities. Today, it has 16 universities, 35 technological colleges and more than 100 research and development institutes.

Both of Julia's parents are physicists, and she has "participated" in scientific conferences and workshops since she was 3. "My destiny was predetermined," says Julia, "although my parents never influenced my decision to study physics at the Ural State University. They were proud, I guess, but very concerned because they could foresee the upcoming changes in Russian science due to Perestroika and the fall of the Soviet Union."

In 1996, a year before getting her bachelor's degree, Julia traveled to the US as a visitor and had a chance to do research at Northwestern University in Evanston, Illinois. The next year, she was invited there by Prof. **Arthur Freeman** to study the electronic structure of pure and rare-earth-doped fluorites, and after that she spent summers at Northwestern as a predoctoral research fellow studying strongly-correlated materials and their properties from first-principles.

Her trips between the two continents continued after she entered graduate school at the Institute of Metal Physics (IMP) of the Russian Academy of Science, where she worked with Prof. **Vladimir Anisimov**. This work resulted in a fruitful collaboration between IMP and Northwestern. During one of those trips, in December of 2001, she met **Alexey Yamilov**, who was a postdoc at Northwestern at that time. According to Julia, "we fell in love, but Alexey set a condition--I had to defend my PhD thesis before marrying him." Julia got her PhD in June of 2002, and came back to the US for two years of postdoctoral work at Northwestern, where she worked on the structural, electronic, magnetic and optical properties of dilute magnetic semiconductors, colossal magnetoresistive oxides and transparent conductors.

At UMR, using first-principles computational methods, Julia designs novel multifunctional materials for advanced technologies including photovoltaic, spintronic, thermoelectric, and alternative energy applications. More details on her research are on the web at <http://web.umn.edu/~juliaem/>



Julia Medvedeva

Congratulations to UMR's 2005 Physics Degree Recipients!

May 2005

Bachelor of Science

Matthew Allen Krems
Christopher James Schwartz

Master of Science

Cho-Han Lee

Doctor of Philosophy

Andrew Richard Prideaux

December 2005

Bachelor of Science

Jason Douglas Bart Sutin
Samuel Paul Woods

Master of Science

Armin R. Ahlheim
Mark Dickison
H. M. Lalani Kumabi Werake
Aranwela Hemantha

Doctor of Philosophy

Zhangjin Chen
Shaine Joseph
Weerasinghe A. Priyantha
Adam Gregory Tournier

Leaving a Legacy Through Your Will

A planned gift makes a perpetual statement about your dedication to MSM-UMR. While many may not be able to establish an endowment today, they find that they are able to leave a significant legacy to the university through a planned gift, such as a bequest, life income gift, or life insurance. By making a planned gift, you show your loyalty to an institution that has played a significant role in shaping your future. For more information about giving a planned gift, contact **Lynn Bennett** at 573-341-4508 or e-mail her at lbennett@umn.edu.

Richard Anderson Remembered

Richard Alan Anderson was born on August 9, 1930 in Rock Rapids, Iowa, near the borders of Minnesota, South Dakota and Nebraska. He attended Augustana College in Sioux Falls, South Dakota, and obtained a B.A. degree in 1952. For his graduate work in physics he attended Kansas State University in Manhattan, Kansas, obtaining an M.S. degree in 1954 and his Ph.D. in 1959 under the guidance of Professor **R. H. McFarland** who later came to UMR. While at Kansas, Richard married **Mary Alice Toburen** on March 31, 1957. They were blessed with one daughter, **Tori**, who married **Gary Bryson** and they have a son **Tyler** who is now 2-½ years old.

Richard chose a career in science and education. He was an instructor at Kansas State University in 1958. He joined the University of Missouri-Rolla in the fall of 1958 as an Assistant Professor of Physics, was promoted to Associate Professor in 1964 and to Professor in 1969. He was on sabbatical leave at the University of Oklahoma in 1968-1969, and at McDonnell Douglas, St. Louis in 1979. He spent about ten summers working at many research laboratories such as Los Alamos Scientific Laboratory, Argonne National Laboratory, and several U.S. Air Force Laboratories. He retired as Emeritus Professor of Physics in 1992.

Richard was a dedicated teacher and researcher who authored and co-authored about 50 refereed papers and gave many talks and seminars in the fields of atomic and molecular physics and electromagnetic phenomena. His graduate work at Kansas State led to four research articles on emission properties of mixtures of gases in discharge tubes. At UMR, he continued working on emission properties from various discharges and measuring lifetimes and characteristics of excited states in many molecules. He published articles dealing with the scattering properties of the

atmosphere which are of interest in Lidar studies. He focused some of his latter efforts on optical properties relevant to lasers, as well as energy related topics such as solar heating of houses. He was principal research advisor to six graduate students and published a number of papers with them. He also taught the Advanced Laboratory course in physics where several of the projects done in that laboratory by undergraduate students led to research publications. He was a member of Sigma Xi, the American Physical Society, American Association of Physics Teachers, Missouri Academy of Science, Optical Society of America, Society of Photo-Optical Instrumentation Engineers, and a Fellow of the American Society for Laser Medicine and Surgery, Inc.

In the fall of 2004, Richard and Mary Anderson moved from Rolla to Vancouver, Washington, where Richard died on 30 April 2005. We celebrate his life and achievements, but lament his early passing and offer our deepest sympathy to his family. *Ibrahim Adawi, Edward B. Hale, and Robert H. McFarland, 2005.*



Richard Anderson

Physics Department Acknowledges Corporate Support

The Physics Department gratefully acknowledges the support of the following corporations:

Boeing Company
Pacific Northwest National Laboratory
Research Corporation
3M
Chevron Corporation
ConocoPhillips
Experimental & Math Physics Consultants
General Mills Incorporated
Shell Oil Company
Joe McClure Farm Equipment & Trailer

UMR Physics Faculty Receive Teaching Awards

This past year, three physics faculty members were honored with teaching awards. **Ron Bieniek**, **Allan Pringle** and **Greg Story**, received the UMR *Outstanding Teaching Award*, which honors the top 10 percent of teachers campus-wide. In addition, Ron Bieniek and Allan Pringle received the College of Arts and Sciences *Excellence in Teaching Awards* for their outstanding effectiveness in large-enrollment courses. According to Dean **Paula Lutz**, "The award is designed to honor a group of faculty who make a special contribution to student retention."

UMR Hosts Second Annual UMR-UMSL Physics Meeting

On October 14, 2005 UMR hosted the Second Annual UMR-UMSL Joint Physics Department Meeting. These meetings are intended to foster closer ties between the departments, and to strengthen the cooperative Ph.D. program. About thirty students and faculty from UMSL made the trip to Rolla for the meeting.



Max Bertino and Dan Waddill

Graduate student research from both departments was featured in a large number of impressive poster presentations, and a lively discussion of the research took place over lunch and during the early afternoon. Cash prizes and certificates were awarded for the top three posters with UMR student **Raghuveer Gadipalli** awarded \$500 for first prize, UMSL student **Jorge Brea** awarded \$300 for second, and UMR student **Matt Foster** awarded \$200 for third. The awards were presented prior to a keystone colloquium given that afternoon by Professor **R.G. Hamish Robertson** from the University of Washington entitled "Neutrinos: The Mass That Roared."



Zhangjin Chen, Matt Foster, and Allison

New Physics Faculty: Alexey Yamilov

Alexey Yamilov was born and grew up in Donetsk, a city in the eastern part of the Ukraine. Donetsk is in a heavily industrial region, with coal mining and metallurgy being dominant. Alexey graduated with honors from Donetsk Technical College (equivalent to high school) in 1992 and was admitted to Donetsk State University. In 1995 he received a BS in Physics, with a thesis "Application of Kadanoff-Baym kinetic equations to calculation of electro-conductivity in disordered systems." In 1997 he received a MS (summa cum laude) in Physics/Engineering. His MS thesis was "Study of multicomponent systems in the framework of the renormalization group equation." In 1997 he was admitted to the physics program at the graduate center of the City University of New York. His PhD advisor was Professor **Alexander A. Lisyansky**. He received a PhD in 2001 for his thesis "Concept of local polaritons and optical properties of mixed crystals and quantum heterostructures."

After he completed his PhD, Alexey moved to Northwestern University in Chicago where he worked with Professor Hui Cao first as a postdoctoral fellow and then as research associate. He currently investigates wave propagation and localization in random and periodic media, in particular the effects of disorder in

photonic crystal structures, resonant photonic crystals, interplay between light localization and amplification, random lasing, and various mesoscopic phenomena in light and acoustic wave transport.

Alexey met **Julia Medvedeva** at a Christmas party organized by their department in 2001, and Alexey and Julia were married during the summer of 2003 in Evanston, Illinois. More details of Alexey's research can be found on the web at <http://web.umn.edu/~yamilov/>.



To Contact UMR Physics

If you would like to contact us for any reason, you can reach us by phone at (573) 341-4781 and by e-mail at physics@umr.edu. You might also be interested in checking out our web page, <http://www.umn.edu/~physics>.

Hagen Leads Study to Reduce Aircraft Emissions

The production of cleaner, more efficient aircraft engines is the goal of experiments conducted by UMR's Cloud and Aerosol Sciences Laboratory and UMR's Center of Excellence for Aerospace Particulate Research, in collaboration with NASA and industry partners. Professors **Don Hagen** of the Physics Department and **Phil Whitefield** of the Chemistry Department lead the effort, working closely with UMR's **Darryl Alofs**, Professor of Mechanical and Aerospace Engineering, and **Gary Gadbury**, Assistant Professor of Mathematics and Statistics.

The Center of Excellence for Aerospace Particulate Research, a leader in the study of aerospace emissions and their effect on the environment, recently received a \$1.185 million grant from NASA, along with a \$259,000 grant from the California Air Resources Board and a \$159,000 grant from the Federal Aviation Administration to further its research in this area. For more than a decade, Hagen and Whitefield have been studying particulate emissions produced by aerospace activities, such as aircraft operations and rocket launches. Their work with others has led to the development of an internationally accepted approach to characterize the nature of particulate matter, or soot, in jet engine and rocket exhaust.

Currently, the researchers are in the process of applying that approach to gather essential data in the upper atmosphere where the aircraft cruise, and also to examine the environmental impact of airport expansion on local air quality.



probe setup with UMR instrumentation trailers in the background

Hagen, Whitefield, and a team of UMR staff members and student researchers transported the center's mobile laboratory to Cleveland Hopkins International Airport for a series of tests during early November 2005. Extensive airplane emissions data were gathered as a result of cooperation with Cleveland Hopkins International Airport, Continental Airlines, Continental Express

Airlines and FedEx Express. During the collaborative effort, as part of the Aircraft Particle Emission Experiment 3 (APEX3) Project, engine exhaust and plume development were studied by acquiring data from behind parked aircraft. The tests at Cleveland Hopkins were part of a national effort to study aircraft particulate emissions using a variety of aircraft.

Cleveland's testing was the first to include small jets and large cargo aircraft. The industry partners supplied regional jets (ERJ 135/145, supplied by Continental Express), commercial jets (Boeing 737 and 757, supplied by Continental) and wide-body aircraft (A300-600, supplied by Federal Express). Exhaust samples were collected by a probe fixed at various distances behind the engines, and were distributed to instruments in nearby trailers. The probe had the versatility to accommodate different engine heights on the assortment of aircraft included in the test. Emissions data were taken at a full range of engine operating conditions.

The UMR Center of Excellence for Aerospace Particulate Research coordinates research conducted by UMR and a consortium of private and public interests that include universities like Massachusetts Institute of Technology, the University of California and the University of Central Florida; federal agencies like NASA, the Federal Aviation Administration, the Environmental Protection Agency, the Department of Defense and Transport Canada; engine and airframe manufacturers General Electric, Pratt and Whitney, Rolls Royce and Boeing; and private firms like Aerodyne, Inc. and Lilienfeld Associates.

In addition to its commercial aircraft studies, the center also works with the Department of Defense to help reduce military aircraft emissions to allow them to operate their aircraft at bases in the United States and stay within the rules of the Clean Air Act.



probe positioned behind a Boeing 737

Schulz and Pringle Chosen as Curators' Professors

Dr. **Michael Schulz** was named Curators' Professor of Physics, and Dr. **Allan Pringle** was named a Curators' Teaching Professor during UMR commencement ceremonies Saturday, Dec. 17.

The University of Missouri Board of Curators approved both designations at its Oct. 7 meeting at the University of Missouri-St. Louis.

The Curators' Professorship is awarded to outstanding scholars with established reputations in their fields of study. Schulz studies atomic physics with an emphasis on ion-atom collisions. His research is focused on improving the understanding of the many-body problem, one of the unsolved fundamental problems in physics, which is highly relevant in areas well beyond atomic physics.

"I am very pleased that the Board of Curators has selected Dr. Schulz for this high academic honor," says UMR Chancellor **John F. Carney III**. "This public recognition of his research accomplishments is richly deserved and brings added prestige to the department of physics and the University of Missouri-Rolla."

Schulz joined the UMR faculty in 1990 as an assistant professor of physics. In 1996 he was named associate professor of physics and in 2002 was named professor of physics. In 2003, Schulz was named Director of the Laboratory for Atomic, Molecular and Optical Research.

His research has been published in numerous journals, including the British journal *Nature*. Since joining the UMR faculty, Schulz has received several Faculty Excellence Awards from UMR. In 2004 he was named Fellow of the American Physical Society and received the Mercator Award from the Deutsche Forschungsgemeinschaft.

Prior to joining UMR, Schulz was a research associate at Kansas State University from 1989-1990. From 1988-1989 he served as a research associate at Oak Ridge National Laboratory in Tennessee and from 1981-1987 as a teaching assistant at Heidelberg University in Germany. From 1998-1999 and again in 2000, Schulz was a visiting professor at Freiburg University in Germany. In 2004, Schulz served as visiting professor at the University of Frankfurt in Germany. He has also served as a guest scientist at numerous international universities.

The Curators' Teaching Professorship was established at UMR in 1990 to honor outstanding professors, call attention to teaching excellence at UMR, and foster improvements in teaching and learning.

"The selection by the Board of Curators of Dr. Pringle as Curators' Teaching Professor is an excellent choice. He is an outstanding role model for his students in our physics department," said Chancellor Carney. "Professor Pringle is highly regarded among his peers for his innovation and creativity in the classroom, as well as his work with public school teachers and students, show-

ing them the fun in Physics."

A member of the UMR faculty since 1985, Pringle has received seven Faculty Excellence Awards, three Outstanding Teaching awards, and two College of Arts and Sciences Excellence in Teaching awards from UMR. He also serves as a research investigator in UMR's Graduate Center for Materials Research.

Pringle's primary research interests include high-performance permanent magnets, neutron scattering, and magnetic thin films.



*December 2005 Commencement honorees.
Left to right: Allan Pringle, Commencement speaker
Zebulun Nash, student Bradley Roberts, Chancellor
John Carney, and Michael Schulz.*

Congratulations to 2005 Physics Dean's List Recipients

Winter Semester 2005

Benjamin Bethge, Joshua Carey, Christopher Chandler, Paul Gholson, Michael Hoffman, Shellie Huether, Ryan Hupe, Jeffrey Jau, Ryan Kinney, Matthew Krems, Quinn Looker, Lane Martin, Zachary Stegen, Brett Sweeney, Zechariah Thrailkill, Bradley Towery, Steven Underwood, Christopher Van de Riet, Clayton Weidinger, Charles Williams, Samuel Woods.

Fall Semester 2005

Benjamin Bethge, Tara Biggers, Joshua Cardenzana, Joshua Carey, Christopher Chandler, Mark Herrera, Shellie Huether, Ryan Hupe, Lori Kennedy, David Kimzey, Ryan Kinney, Quinn Looker, Ryan Ohs, Samuel Petersen, Ciaran Ryan-Anderson, Lucas Seiden, Dustin Spieker, Brett Sweeney, Zechariah Thrailkill, Bradley Towery, Jake Walker, Clayton Weidinger, Joshua Whitaker, Benjamin Williams, Samuel Woods

The Physics Department gratefully acknowledges the support of the following alumni and friends.

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Jerry Kiefer
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Charles M. Rice
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Agnes and Thomas Vojta
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Phonathon 2006

More than 170 alumni gave \$15,470 in donations to the MSM-UMR Physics Department during last year's fund-raising Phonathon with an average gift of \$75. The department greatly appreciates your generosity, which helps to support scholarships and student activities like the Society of Physics Students.

"With help from last year's phonathon the department made a major effort to increase undergraduate physics enrollment." says Dr. Paul Parris, Chair of Physics. "With new scholarships made possible by phonathon dollars, the department was able to bring in fifteen new freshmen and transfer students, and was able to increase its undergraduate enrollment from 35 to 50 majors, a six year high. This year we are continuing to work towards our goal of 100 undergraduate and graduate majors. We greatly appreciate every additional scholarship dollar you can give that would help the department carry out its aggressive recruitment plan."

The Physics faculty also share your commitment. This past year the department was pleased to endow a major new scholarship, funded by donations from seven physics faculty members who matched a major gift made by a generous physics alumnus. Your support this year will be more important than ever in helping us attract great students to our department.

This year, we will be calling our alumni April 12-April 18. When the phone rings, please take a moment to share some of your Rolla experiences with a current UMR student, and say, "Yes," when asked for a pledge. Taxpayer support accounts for only one-third of the university's revenue, so your contribution makes up an important part of the department's total income. Private funding also helps distinguish UMR from other universities, increasing the value of your education. Any amount you give will be appreciated. It will help make UMR a leader in alumni giving among public universities, and will help the Physics Department fulfill its educational mission.

Banner Year for Tom Gaylord

Thomas K. Gaylord (BS '65), **Julius Brown** Chair and Regents' Professor of Electrical and Computer Engineering at Georgia Tech, had a banner year in 2005. He received the **Esther Belle Hoffman** medal from the Optical Society of America "in recognition of outstanding contributions to optical science and engineering education." The award was presented "for innovative teaching that has brought the latest research results alive for students for 30 years, and for his significant contributions to establishing Georgia Tech's optics and photonics programs."

Tom was also chosen as the 2005 recipient of the Georgia Tech Class of 1934 Distinguished Professor Award. This honor "recognizes sustained outstanding



achievement in teaching, research, and service and is the highest award given to a faculty member at Georgia Tech." In addition to being among Georgia Tech's most highly rated teachers, Tom is the author of some 350 technical publications and 25 patents in the areas of diffractive optics, optical interconnects, optoelectronics, and semiconductor devices. He has graduated more than 20 PhD and several MS students.

Tom also has received a great deal of publicity responding to a challenge from his students, and running in a 5K road race (the Pi-mile) in the spring of 2005. Tom's essay on his racing career has been reproduced in several publications.

UMR Students & Alumni: In Press

The following journal articles which appeared over the last year feature work by UMR undergraduate students,¹ graduate students,² or UMR alumni³ under the supervision of UMR faculty.

"Dynamics at a smeared phase transition," B. Fendler,³ R. Sknepnek,³ and T. Vojta, *J. Phys. A: Math. Gen.* 38, 2349 (2005).

"Critical behavior and Griffiths effects in the disordered contact process," T. Vojta and M. Dickison,³ *Phys. Rev. E* 72, 036126 (2005).

"Monte-Carlo simulations of the smeared phase transition in a contact process with extended defects," M. Dickison³ and T. Vojta, *J. Phys. A* 38, 1199 (2005).

"Experimental and theoretical momentum transfer dependence of the He (*e,2e*) reaction," B.A. deHarak, Zhangjin Chen,^{2,3} D.H. Madison and N. Martin, *J. Phys. B* 38, L145-L152 (May 28, 2005).

"Projectile-residual-target-ion scattering after single ionization of helium by slow proton impact," N V Maydanyuk,³ A Hasan, M Foster, B Tooke,² E Nanni, D H Madison, M Schulz, *Phys. Rev. Lett.* 94, 243201 (June 24, 2005).

"Fully differential cross sections for low energy electron impact ionization of nitrogen molecules," Junfang Gao,² D.H. Madison and J.L. Peacher, *Phys. Rev. A Rapid Communications* 72, 020701 (August 2005).

"Study of exchange distortion and post collision interaction for intermediate-energy electron impact ionization of argon," A. Prideaux,³ D.H. Madison and K. Bartschat, *Phys. Rev. A* 72, 032702 (September 2005).

"Interference effects for low energy electron impact ionization of nitrogen molecules," Junfang Gao,² D.H. Madison and J.L. Peacher, *Phys. Rev. A* 72, 032721 (September 2005).

"An elementary method for calculating orientation-averaged fully differential electron-impact ionization cross sections for molecules," Junfang Gao,² J.L. Peacher and D.H. Madison, *J. Chem. Phys.* 123, 204302 (November 2005).

"Distorted wave born and three-body distorted wave born approximation calculations for the fully differential cross section for electron impact ionization of nitrogen molecules," Junfang Gao,² D.H. Madison and J.L. Peacher, *J. Chem. Phys.* 123, 204314 (November 2005).

"Second-order distorted wave calculation for electron impact ionization of helium to He⁺(*n=1* and 2)," Zhangjin Chen^{2,3} and D.H. Madison, *J. Phys. B* 38, 4195-4209 (December 2005).

"Pre- and post-collision electron-electron correlation effects for intermediate energy proton impact ionization of helium," M Foster,^{2,3} J.L. Peacher, M Schulz, A Hasan and D H Madison, *Phys. Rev. A* 72, 062708 (December 2005).

From Alumnus Scott Price...

After my PhD in nuclear experimental physics in '93 from the University of Wisconsin-Madison, I held a postdoc with the High Energy Spin Physics group led by **Alan Krisch** at the University of Michigan-Ann Arbor. We built parts of an ultra-cold spin-polarized hydrogen gas jet target for the NEPTUN collaboration designed to be installed in the TeV beam line at Protvino, Russia. On the list of parts were: a low-temperature RF transition unit, design of a low temperature hydrogen 'mirror', a maser ring-down polarimeter, and temperature monitoring equipment for the commissioning of the higher-power low-temperature dilution refrigerator.

I was an accelerator staff member at the Thomas Jefferson National Accelerator Facility from '95 to '99 and worked with the injector group to commission the quiet high continuous current spin polarized electron source using diode lasers and GaAs crystals to produce the beam. I led the team that built and commissioned the 5 MeV Mott scattering polarimeter. In early 1999 I accepted a

job offer from GE Medical Systems in Milwaukee, Wisconsin, as senior development engineer. I recently joined the Nanomechanics and Physics Lab here at Global Research and Development Center in Niskayuna. We recently underwent a name change as part of a re-organization at the center.

My son **Thomas** is a freshman in college aiming for an EE major, and **Juliette** is a junior at the Niskayuna High School. **Gisèle** and I continue to travel to France as often as we can.

Regards to my classmates from UMR: **Eric Adams, Jon Brinkman, Wayne Hoffman, Tom Holley, Mike Marden, and Carol Russell**. Congratulations to **Ted Deskin** upon his recently announced retirement.

Scott Price, Physicist/X-ray Technologist, High Energy Physics Lab, Advanced Mechanical Technologies, GE Global Research, Niskayuna, NY 12309.

Alumni Notes

Chris Thornton (BS '90) writes "son **Ian Michael** born December 4, 2004. Mother and baby doing great!!"

Arthur Nickless (BS '65) wrote that he was looking forward to my first visit in Australia last April.

James Canner (MS '65, PhD '69) says "after losing my job of 25 years with a large Japanese corporation due to globalization, I now work for the son of a UMR professor in the same field in a small business. Is this called localization?"

David Webster (BS '69) tells us "I retired from Raytheon on January 1, 2005, and am now pursuing a career as a consultant in the area of image analysis."

Carl Sigler (BS '72) retired from Conoco Phillips in March of 2004, after 32 years of service.

Robert Schwenker (BS '63) writes "when the magnetic disk drive division was sold by IBM to Hitachi in 2002, I retired after 39 years with IBM. After working for Hitachi Global Storage Technologies as Intellectual Property Development Manager for two years, I again retired and now spend much time with our five grandchildren."

James Willcutt (MS '67) reports "will retire in July 2005. Plan to fish, do woodworking, and play with my grandson."

Frank Kone (MST '70) says "Enjoyed chatting with **Lauren Rich** during the UMR Physics Department phonathon,

reminiscing about UMR and the Physics Department in the late 60's was fun!"

Rastko Sknepnek (PhD '04) has taken a postdoctoral position at the DOE Ames Lab and Iowa State University to work with Prof. **Joerg Schmalian**.

Brian Millburn (BS '75) writes "Aerospace Corporation promoted me to Systems Director (manager) in charge of its Colorado Springs Analysis Center. I also remain one of the senior analysts supporting Air Force Space command with effectiveness and cost analyses for their space systems acquisition programs. I am also the Chairman of the Deacons at my Church. As an Assistant Scout Master, I continue to help Boy Scouts earn their merit badges. My oldest two sons are at Adams State College (music and computer science) and the third (and youngest) is nearly 21 years old. Their oldest sister, her husband, and 4 year old daughter visited us for Christmas 2004. I really enjoyed my 'Grandpa' time."

If you wish to get in touch with any of these alumni, or any others, please contact the Physics Department at (573) 341-4781 or at physics@umr.edu. We can generally give you current phone numbers, along with postal and e-mail addresses. We would be grateful if you would take the time to fill out and return the alumni information on both sides of the last page of this newsletter.

Frontiers in Physics Colloquium Series

The 2005 *Frontiers in Physics Colloquium Series* started with two talks on biological physics given by Prof. **Ioan Kosztin** from the University of Missouri–Columbia and Prof. **Sonya Bahar** from the University of Missouri–St. Louis. The series was then highlighted by a number of outstanding talks from candidates for the new faculty position in condensed matter theory. The first of these talks with the title “*Non-Fermi Liquid Behavior in Correlated 3D Electrons in Ultra-High Magnetic Fields*” was given by Dr. **Shan-Wen Tsai** from Boston University. Other highlights from the faculty candidates were the talks by Dr. **Kyungwha Park** (Naval Research Laboratory) entitled “*First-Principles Calculations on Single-Molecule Nanomagnets*” and by Dr. **Julia Medvedeva** (Northwestern University) entitled “*Novel Multifunctional Materials: First Principles Approach*”. Dr. Medvedeva has joined the department as faculty member this past year.

Later in the spring semester, Prof. **Cristina Marchetti** from Syracuse University gave a very interesting talk on “*Rain Down Dirty Windshields and Vortices in Superconductors: The Collective Dynamics of Driven Disordered Systems*,” and Prof. **Thomas F. George**, who is also the Chancellor of the University of Missouri–St. Louis spoke about “*Molecular Clusters: Fullerenes and Photoexcitation*.” The spring series closed with a talk on “*X-Ray Imaging Technology: Medical, Non-Destructive Testing, Opportunities in the Future*” by Dr. **J. Scott Price** from the GE Global Research Center.

The fall semester brought a change of colloquium organizer with faculty member **Michael Schulz** taking over the duties as colloquium chair.

In the fall semester a broad range of different areas in physics was covered, including atomic physics, condensed matter physics, high-energy physics, medical physics, and cosmology. In addition, a talk addressing funding of basic research was given by Dr. **Steve Pierson** from the American Physical Society.

The presentations on atomic physics were given by Dr. **Nick Martin** from the University of Kentucky on “*Electron and Photon Impact Ionization: Extracting Fundamental Quantities from Experiment*,” and by Dr. **Klaus Bartschat** from Drake University on “*High Precision Cross Sections for Electron-Atom Collisions in Laser and Lighting Applications*.” Condensed matter physics talks included Dr. **Michael Kalyanaraman** from Washington University, “*Towards Laser-Based Assembly of Ordered Metal Nanoclusters*,” Dr. **Y.K. Hong** from the University of Idaho, “*E-Beam Patterned Pac-Man Shaped Magnetic Element and Magnetization Process for MRAM Application*,” and Dr. **Elbio Dagotto** from Oak Ridge National Laboratory, “*Complexity in Strongly Correlated Electronic Systems*.” Dr. **Alexander Lisiansky** from the City University of New York, “*Light Localization in One-*

Dimensional Disordered Photonic Crystals,” and Dr. **Ya Cheng** from the University of Missouri-Rolla, “*Integration of 3D Microoptics and 3D Microfluids in a Glass Chip for Lab-on-a-Chip Applications*” covered condensed matter physics. Talks on high-energy physics were given by Dr. **Andreas Schmitt** from Massachusetts Institute of Technology, “*Solid State Physics in Neutron Stars: An Introduction to Color Superconductivity*,” and Dr. **Hamish Robertson** from the University of Washington, “*Neutrinos: The Mass that Roared*.” Finally, Dr. **Dan Odero** from the Raleigh Regional Cancer Center, who received his Ph.D. from the Physics Dept. at UMR, presented a talk on Medical Physics, entitled “*Technical Aspects of Prostate and Breast Cancer Treatment Using Radiation Therapy*,” and Dr. **Ian Redmount** from St. Louis University talked about cosmology in “*Particle Dynamics in a Dark-Energy-Dominated Universe*.”

A special event was the annual joint workshop between the Physics Departments at UMR and the University of Missouri at St. Louis. For this event it is a goal to find a distinguished speaker with a particularly exciting topic for the colloquium, and the search was certainly successful. We were quite fortunate to have Dr. Robertson to talk about revolutionary research performed in Neutrino Physics. An amazing result of this research is that the neutrinos emitted for example in beta decay are not really particles in the conventional sense, but rather superpositions of 3 other types of neutrinos, thus revealing the first major flaw in the Standard Model.



Hamish Robertson

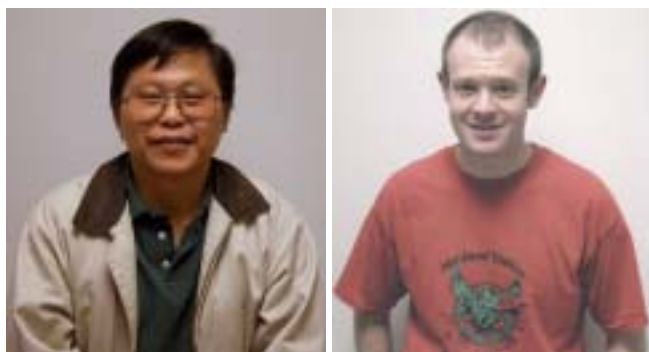
Twelfth Annual Schearer Prize Competition

The Twelfth Annual *Laird D. Schearer Competition for Graduate Research*, established by the family of Dr. **Laird D. Schearer** to recognize research performed by a graduate student, was held on December 1, 2005. Professors **Ralph Alexander**, **Barbara Hale**, and **Bob DuBois** judged the competition with Dr. DuBois chairing the Committee.

Seven students submitted applications for the 2005 competition. Their applications consisted of a short description of their research, copies and lists of any publications and presentations they have made, plus a résumé. These were used to select three finalists who gave oral presentations of their work during one of the departmental colloquia. The finalists were **Zhangjin Chen** who is advised by **Don Madison**, **Matt Foster**, advised by Don Madison and **Jerry Peacher**, and **Alex Silvius**, who is advised by **Paul Parris**. Titles of their talks were “*Second Order Distorted Wave Calculations for Electron Impact Ionization Processes*” (Chen), “*Fundamental Effects of Ionization Collisions*” (Foster), and “*Chaotic Dynamics of a Free Particle Interacting Linearly with a Harmonic Oscillator*” (Silvius).

All three students gave excellent talks and impressed the Committee with the quality of their research. After deliberation, the Committee awarded first prize to Mr. Silvius, second prize to Mr. Chen, and third prize to Mr. Foster.

Because of the generous donations of the Schearer family, cash prizes were awarded to the finalists. Following the presentations, the finalists and numerous faculty members had a relaxing dinner at a local restaurant.



above: Zhangjin Chen (left) and Matt Foster (right)

right: Schearer Prize Winner Alex Silvius

From Schearer Prize Winner Alex Silvius

I am honored to be the winner of the 12th Annual *Laird D. Schearer Competition for Graduate Research*. I would like to thank the Schearer committee for selecting me as a finalist and giving me the opportunity to present my research. Each finalist gave a very good talk and I was ecstatic to have been selected the winner from this competitive field of entrees. I would also like to thank my advisor Dr. **Paul Parris** for his patience and guidance on this project as well as our collaborator Dr. **Stephan De Bièvre** of the University of Lille, France. I would like to thank my family and especially my wife, **Megan**, for their support throughout my physics career.

My graduate career in physics at UMR began in the summer of 2000. But my interest in computational physics had been sparked earlier in my undergraduate career. While taking Dr. **Greg Story's** Quantum Electronics class here at UMR we were assigned to simulate trapping of particles in an optical molasses. The first project was a one-dimensional exercise that I later extended to a three-dimensional model as part of my final project. I have found the UMR Physics Department to be a supportive and inspiring place to work, surrounded by faculty engaged in exciting work.

The talk I presented in the Schearer competition focused on the chaotic dynamics that occurs in a simple Hamiltonian system involving a free particle and a harmonic oscillator. An intriguing part of this research was that this closed system consisting of a ball interacting with a spring demonstrated chaotic behavior. The model proved to be an interesting study in nonlinear dynamics as well as leading to other projects. I enjoyed this work due to the challenge it provided and the knowledge gained from it, and would like to thank the Schearer family for the chance to share it.



Student Notes

UMR Physics major **Ryan Kinney** writes...

I won second place at the first ever UMR Undergraduate Research Symposium in the Natural Sciences division in April. Then I went to Caltech over the summer for an REU (Research Experiences for Undergraduates) I worked for the LIGO (laser interferometer gravitational-wave observatory) project. My project was to develop a noise budget for the 40-meter advanced prototype. I had to measure the noise in the data signal from the different components of the prototype. By getting a noise budget, we can track the improvements made in the sensitivity of the device so that it can eventually reach the sensitivity required to detect gravitational waves.

Last fall I went to London, England for the Missouri-London program. There I studied Shakespeare, psychology, British dialects, and British culture. I basically got my humanities out of the way. While in London, I was able to visit all the famous places like Big Ben, the Prime Meridian, the London Eye, the West End, Buckingham Palace, Westminster, Parliament, Oxford, Stratford-upon-Avon, the Globe Theater, and other cool places. I was able to go to Scotland twice, walked across the river Kelvin (where Lord Kelvin got his name), and visited beautiful Edinburgh Castle. I was also able to visit France four times: once to a city called Tour, twice to Paris, and once on the TGV traveling from Italy to Paris and then to London; I went in the Chunnel three times. I also went to Italy and visited Rome, Pisa, Florence, Venice, Verona, and Milan. I also went to Geneva, Switzerland but didn't have enough time to see CERN. Finally I went to Krakow, Poland and saw their famous dragon.

It was a great experience and I recommend everyone do it!

This summer I hope to be in Germany doing my final REU (I plan to graduate in December). If I don't go to Germany, then my other options are in Ireland or France. The REU is through the University of Central Florida.

I am currently applying to the Navy as a nuclear engineer, so we'll see if I get accepted. My hope is that I can get experience with nuclear reactors in the navy, eventually pick up a PhD and maybe become an astronaut. Hopefully, I can go to the moon, since I will have the right education and experience by the early 2020's.

This semester I am once again a LEAD Peer Learning Assistant and am continuing my research with Dr. **Thomas Votja**. I am also the President of SPS, and we are experiencing a great revival! Finally, I am training for a triathlon. The training is pretty slow going since I need to learn how to swim.



Editors' Note: on your next visit to UMR, if you see someone riding a bike full speed down the second floor hallway of Physics, or standing on the table in front of the main lecture hall waving a pointer like a Samurai sword at a group of students, be sure to say "hello" to Ryan.

Faculty Notes

Gerry Wilemski coauthored a paper that was selected as a "Hot Paper," based on the outstanding reviews it received, by the editors of the journal of Physical Chemistry Chemical Physics. The paper was "*Experimental evidence for internal structure in aqueous-organic nanodroplets*," B. E. Wyslouzil, G. Wilemski, R. J. Strey, C.H. Heath, and U. Diergswiler, Phys. Chem. Chem. Phys., 8, 54-57 (2006). The paper was recently given more publicity by the Royal Society's magazine Chemical Science, and an article can be found on the web at http://www.rsc.org/Publishing/ChemScience/Volume/2006/02/nanodroplet_structure.asp.

Thomas Vojta and **Max Bertino** received 2004 UMR Faculty Excellence Awards.

In January 2006, **Jose A Hoyos** joined the UMR Physics Department as a postdoctoral research associate. Jose grew up in Manaus in the State of Amazon in Brazil. He received his PhD in Physics in 2005 from the University of Campinas near Sao Paulo. Together with faculty member **Thomas Vojta**, Jose is now working on the properties of strongly disordered quantum magnets.



Jose Hoyos

Allan Pringle coordinated one of Missouri's eight regional Science Olympiad competitions in February, 2005. Approximately 350 middle through high school students from 24 schools in South-Central Missouri participated in this event. The top four teams in each of two divisions qualified for the State tournament.

Come Back for Homecoming

The UMR Physics Department warmly invites you to return to Rolla for **UMR Homecoming 2006 on October 20-21, 2006**. On Friday afternoon, October 20, the department will hold an open house and special programs for its alumni and friends. Tours of laboratories and educational facilities will be offered and there will be opportunities for interaction with current UMR physics students. Come see what we have done since you received your degree.

In keeping with a long-standing tradition, a UMR alum will deliver the Homecoming 2006 Physics Colloquium at 4 PM. on Friday, October 20. Later that evening, professors **Ed** and **Barbara Hale** will host a homecoming reception in their lovely home. Contact us at physics@umr.edu for specific information about physics department activities, or alumni@umr.edu for general homecoming information. Come home to your college roots, and help us celebrate UMR's past, even as we work to shape its future!

So What's News with You?

We hope you enjoyed this year's edition of **Matter 'n Motion**. We enjoy keeping you informed about what is going on at UMR, but we'd also like to know what's new with you, both personally and professionally. Any information you send will be circulated in the department and, if appropriate, inserted in the next physics newsletter unless you request otherwise.

Please print or type your information, and include your mailing address so that we can update our records. Mail to: **UMR Physics Department, University of Missouri-Rolla, 65409-0640**. Or, if you would prefer, you can e-mail us your comments at **physics@umr.edu**. Thanks for keeping in touch. It's always good to hear from old friends.

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News or Comments: _____

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