2004 Physics Newsletter

Editor's Corner
Mick O'Shea


Mick O'Shea

Greetings from the Physics Department. Our winter started out with a whimper and at the end of January winter arrived in all its glory with lots of snow and university closings occurred for a full day and part of a day.

Our campus continues to change slowly. The demolition of Denison Hall will begin this spring semester. The Department of English will be moved from Denison into the old Lafene building early this spring. The name Denison will be retired and held for a possible naming of a new building in the future. A proposal, led by the KSU Foundation, calls for a hotel and parking garage to be built in the current K-State Student Union parking lots. Skyways connecting the garage to the Union. A non-binding contract has been signed with the Shaner Hotel Group to investigate the feasibility of the project.

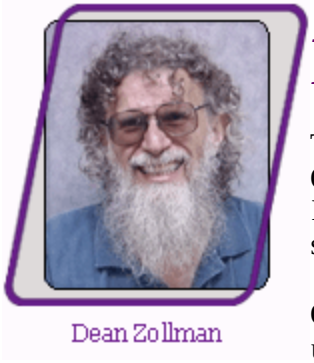
The current occupation of Iraq continues to affect the university community strongly, especially with Fort Riley so close. We all hope that the situation there will be resolved in the near future.

Provost James R. Coffman, who has served as the universities chief academic officer for 16 years, will leave this post this summer. He will return to part-time work in the College of Veterinary Medicine after a sabbatical. Our new provost will be M. Duane Nellis who comes to us from West Virginia University, where he has been Dean of the college of Arts and Sciences since 1997. Duane is well known at K-state from his earlier work here as Associate Dean of the college of Arts and Sciences.

Stephen White, who has served as interim dean since January 2002, is now officially the Dean of the College of Arts and Sciences. Peter Nicholls, the previous dean, resigned in January 2002 to become provost at Colorado State University.

Fire left a scar on Aggieville last May. It began in the bathroom ceiling of Aggie Station destroyed the bar and and Krystallo's which was next door. Porter's and Varney's Book Store experienced heavy smoke damage totaling more than $1 million.

On December 6th K-State upset Oklahoma, 35-7 before a sold-out crowd at Arrowhead Stadium to capture the Wildcats' first Big 12 championship. The crowd at Aggieville was loud, boisterous and well behaved as they celebrated the championship win over Oklahoma on Saturday night. The win sent K-State to the Fiesta Bowl on Jan. 2nd, 2004 where after a valiant battle with Ohio State K-State were defeated 35-28.



Dean Zollman

Department Head's Corner

Dean Zollman

The past year was a pretty good one for the KSU Department of Physics. Of course, we continued to struggle with the State's economic situation. However, the difficulties with the budget were somewhat offset by the successes of our faculty and students.

Our student enrollment stays rather steady. We have about 40 undergraduate physics majors and 60 graduate students. Last Spring 6 of our students received a Bachelors degree while one finished his B.S. in December. Four of the seven students enrolled in graduate school while the other three are now employed. Of the graduate students, one received a M.S. degree while nine received Ph.Ds. during the calendar year. Most of our Ph.D. students are now serving as postdoctoral research associates or postdoctoral fellows in either national laboratories or other research universities. At both the undergraduate and graduate level our students are doing well and are being placed in good schools or good entry level positions.

Two of our majors, Aaron Wech and Jonathan Whitmer, received Goldwater scholarships in 2003. A separate article in this newsletter describes Aaron's and Jonathan's accomplishments. (See http://www.act.org/goldwater/) As President Wefald likes to point out, Kansas State continues to receive a disproportionate number of these prestigious scholarships. In fact, physics department students also receive a disproportionate number. In the past 15 years, eight of our majors have received Goldwater Scholarships. That number represents 17% of the total number of Goldwaters received by KSU students. Yet, all science, mathematics and engineering students are eligible. So, with far less than 1% of the total eligible students, the physics department students garner a much greater percentage of the Goldwater'.

Of course, one of the reasons for Physics students doing well in Goldwater's is that they tend to be quite good students. However, we think that we as a faculty can also take some credit because we get all of our undergraduates involved in research very early in their careers. Thus, when they are completing the application for prestigious national scholarships such as the Goldwater, they are in a very good position to discuss some significant research in physics. These research activities play an important role in the selection process.

Kara Gray

Eli Parke

We have also done quite well with the most prestigious KSU scholarship for incoming freshmen, the Kassebaum scholarship. This scholarship has only been in existence for about six years and two physics majors, Kara Gray and Eli Parke, have been recipients. Again, about 4% of the Kassebaum's have gone to Physics majors while the fraction of incoming freshman who declare their majors as physics is less than ½ of 1%.

About two years ago we started a Physics minor option with the idea that we could attract some of the good engineering students to enroll in a few of our upper-level undergraduate courses and add a physics minor to their engineering major. Its working better than we had ever expected. We now have about 25 declared physics minors and the number seems to be growing somewhat rapidly. For the first time in my memory we actually turned students away from Physics 3, a course that used to be called Modern Physics.

We have also been working with the College of Business Administration to set up a program for students who have a strong interest in science and would like to enter the technical business world after graduation. We have developed two options, one is a physics major with a business minor; the other, a 5½ year program which results in a B.S. in Physics and an M.B.A. We will begin recruiting our first students for these programs in the coming summer.

The other major teaching related event of the year was the awarding of the Presidential Award for Excellence in Undergraduate Teaching to Larry Weaver. Many of you helped in that process by sending notes about your experiences and learning from Larry while you were students here. Some of these notes discussed specific classes that you had taken from Larry but a significant number began with "I never had a course from Larry but..." and then went on to talk about how discussions with Larry had helped you understand a variety of different topics. When the associate dean who is in charge of the selection process announced to the department heads that Larry was to receive this award he said, "I don't know why we didn't do this many years ago." I'm sure all of us felt the same way.

Research funding during the past year has held rather steady. The KSU Research Office lists our funding for 2003 at $7.3 million dollars. The full report for KSU is available at http://www.ksu.edu/research/awards/fy2003/awards03.pdf. Right at the end of the year we received notification that the Macdonald Lab's grant with the Department of Energy would continue to be funded at a little over $2 million per year for the next three years. Most of the research efforts in the department are described in other articles in this newsletter, so I won't go into detail here. I will say however that critical contemporary topics such as novel materials, nanoscale science, high power - short-pulse lasers and dark energy are all areas of importance in our research efforts.

Changes in personnel continue to be an ongoing part of our department. Two departures and two retirements occurred during 2003. Regina Demina, an assistant professor with the High Energy Physics group, left KSU to accept a faculty position at the University of Rochestser. Tom Gray who was Associate Director of the Macdonald Laboratory and a Professor, retired after over 20 years at KSU. Some of you will remember that Tom was the critical player in the upgrade of the Macdonald Laboratory which occurred in the 1980s. His guidance and careful supervision helped assure the quality and timeliness of that upgrade. Photographs from Tom's retirement party can be found on our website at: http://www.phys.ksu.edu/submenu/events/gray.html.

Our support staff also underwent some changes during the past year. Dave Hill who had over 34 years of experience in our Machine Shop also retired during the past year. Essentially everyone on our faculty who used the machine shop has had some experience when Dave Hill took our idea for something that we needed and made it better than we could have possibly imagined. Ron Jackson who had been heading our Machine Shop for the past seven years moved to Colorado when his wife received a prestigious postdoctoral fellowship in veterinary medicine. Pictures from Ron's going away and Dave's retirement can also be found on our website at http://web.phys.ksu.edu/Retirements/index.htm.

Fortunately, it was not all outgoing during 2003. Dr. Kristan Corwin joined the faculty as an assistant professor in August. Dr. Corwin received her Ph.D. from the University of Colorado where her mentor was Carl Wieman, 2000 Nobel Laureate. She then completed a postdoc in Paris and returned to Boulder where she had a research position with the National Institute of Standards and Technology. Kristan is now building a laboratory so that we can expand our

research efforts in laser interaction with matter. She started with an empty space in August and is well on her way to building a research program here.

A second atomic, molecular and optical physicist was also hired during 2003. Igor Litvinyuk needed to finish a research project in Canada and delayed joining our faculty until the beginning of 2004. So at this time he is just getting started and we'll have more to say about him next year.


Joining the staff are two new members of our machine Shop, Michael James as supervisor and Derek Moon. Both come to us with significant experience in instrument making and are now learning about the idiosyncrasies of working at a university and with physics researchers.

Michael James Derek Moon

We had a number of outstanding visitors during 2003. The most notable were Eric Cornell and Carl Wieman who shared the Nobel Prize in 2001 with Wolfgang Ketterle for their discovery of Bose-Einstein condensates. Dr. Cornell visited in February, giving a public lecture and a physics colloquium. Dr. Wieman was here in November. He presented a physics colloquium and was the banquet speaker for the Arkansas-Oklahoma-Kansas section of the American Association of Physics Teachers joint meeting with the Nebraska section.

For the second year the department invited one of its distinguished alumni to present the Ernest Fox Nichols lecture. Dr. John Crawford, who received his PhD under Dean Dragsdorf in 1962 and recently retired as the Executive Vice President of Sandia Laboratories, was the lecturer this year. His talk provided our students and faculty with a nice overview of the types of work that a physicist can do with a national laboratory such as Sandia and with a good look at the career path which begins with research responsibility and builds to major administrative duties.

Two alumni events occurred during this year. The students of Dean Dragsdorf gathered here in May to pay tribute to his career as a mentor. Most of Dean's former students were able to attend. Photos of the event are available at http://perg.phys.ksu.edu/alumni/dragdorf.htm. We also had our first off-campus gathering of alumni at the home of Bill and Joan Porter in Portola Valley, California. Many of our alumni who now live in the Bay Area joined us for an afternoon in the California sunshine. See http://perg.phys.ksu.edu/alumni/bay_area_2003.htm

I'll conclude with just a short note on the budget. As I mentioned earlier, the department's research funding is remaining strong because our faculty are receiving a large number of competitive federal research grants. Each year, the University provides our department with a budget of about $3 million and we respond by bringing in over twice that in research grants. In the past few years the state appropriation for higher education has not kept up with the operating costs. Thus, the University has been forced to make significant increases in tuition. With each increase the University sets aside a fraction to increase the financial aid so that students will continue to have access to KSU. However, each increase can mean that some student will no longer be able to afford a University education. Thus, we will continue to need your help in the form of donations for scholarships to help us assure that all good physics students, independent of financial need, can have access to what we consider a very good education.

In November Frank and Elizabeth Burke completed an endowment donation which establishes the Ernest K. Chapin Professorship in Physics. Ernest Chapin was a faculty member who retired in the 1960s and was Mrs. Burke's father. The Chapin Professorship is part of the State's Faculty of Excellence Program in which the chaired professor receives some funds from the endowment and some from the State of Kansas. We anticipate that the first appointment of a Chapin Professor will occur in about one year.

As we begin 2004 I continue to be optimistic about the Department and particularly the quality of students that we graduate. With your help and support we will continue to do our best to meet our education and research goals.

Sorensen Receives Recognition for Aerosol Research

Christopher Sorensen, university distinguished professor of physics, is the 2003 recipient of the David Sinclair Award presented by the American Association for Aerosol Research.

According to the association, the award recognizes sustained excellence in aerosol research and technology by an established scientist still active in his or her career. The individual's research must have a lasting impact in aerosol science.

Sorensen has researched aerosols for more than 10 years, focusing on the physical characterization of aerosol particles and their aggregation. Aerosols are solid or liquid particles in a gas such as clouds or smoke. When in a gas, they naturally bond to one another in chainlike networks, forming what is called an aggregate.

The application of his research is particularly important in the areas of global warming and visibility problems due to smog in large cities. There are also various industrial applications including the production of carbon black, a substance made from soot that increases the durability of tires, and in the production of titania, the product that replaced lead in lead-based paint.

Sorensen's research has been used in the design of various instruments to measure the size of aerosol particles.

Nobel Prize Winner in Physics Speaks at K-State

Carl Wieman, who won the Nobel Prize in physics in 2001, presented "Resonant BEC: A New Macroscopic Quantum System," on Nov. 7th.

The lecture, sponsored by K-State's department of physics, was free and the public was invited.

Wieman, a distinguished professor of physics at the University of Colorado at Boulder, has carried out research in a variety of laser spectroscopy areas, including using laser light to cool atoms. This led to cooling atoms sufficiently to attain Bose-Einstein condensation, for which he won the Nobel Prize.

In addition, he is the recipient of the National Science Foundation's 2001 Distinguished Teaching Scholar Award and a member of the National Academy of Sciences, the Board of Physics and Astronomy, the Committee on Undergraduate Science Education and the National Task Force on Undergraduate Physics.

Wieman also is a faculty member of JILA, an interdisciplinary institute for research and graduate education in the physical sciences. The institute, on the Colorado campus, is jointly operated by the university and the National Institute of Standards and Technology.

Wieman earned a bachelor's degree from the Massachusetts Institute of Technology and a doctorate from Stanford University. He also was awarded an honorary doctorate from the University of Chicago.

K-State Selects Recipients of 2003 Presidential Award for Excellence in Undergraduate Teaching

The awards, which each include a $2,500 honorarium and a plaque, are supported by the K-State president's office and the Curtin Property Company, a real estate development company with offices in Manhattan and Kansas City. The awards are coordinated through the KSU Foundation. Among the five recipients was Larry Weaver, professor of physics

Weaver has taught almost every course offered by the department of physics. In addition, he serves as a liaison to the College of Education Partnerships Program, which aids future teachers in studying physics. He also has directed the summer Physics Research Experiences for Undergraduates, which brings college physics students from across the region to K-State to study. "I want my students to understand that learning physics is not about simply memorizing facts or plugging numbers into equations. I want students to understand how and why physicists have the knowledge they do," Weaver said.

K-State faculty member since 1970, he was promoted to the rank of full professor in 1984. He is a Fulbright Fellow, serving at Justus-Liebig University in Germany in 1989. He also received the William L. Stamey Teaching Award from the College of Arts and Sciences in 1990.

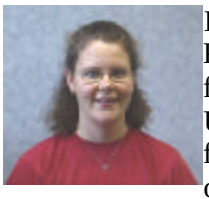
Pat Richard

News from the J.R. Macdonald Laboratory

Pat Richard, Director

The atomic, molecular, and optical physics program in the JRML continues to undergo adjustments with the retirement of two long-time faculty members. Professor Tom Gray, Associate Lab Director for Laboratory Operations since 1989, who has been at KSU since 1975, retired in July 2003, and Professor Siegbert Hagmann, who has been at KSU since 1979, retired in June 2003. Tom's leadership in the construction of the LINAC and in the outstanding coordination of the general repair, maintenance and upgrades of the lab is appreciated by all and will be missed. We are in the very fortunate situation that Associate Research Professor Kevin Carnes has been preparing to take over the position following Tom's retirement. I think Kevin is already comfortable in the new role and doing great. Siegbert, although retiring from KSU, is not retiring from physics. He has taken a position in Germany and is presently working on atomic collision physics experiments at GSI and enjoying his forte of measuring complex multi-particle reaction product dynamics.

As reported in last year's Newsletter, the JRML AMOP program swung into full gear in the area of ultra-short pulse, ultra-high intensity laser research with the construction of the Kansas Light Source, KLS, by Professor Zenghu Chang and his group. The 25 fs TiS laser has become the leading user facility in the lab. Every experimental faculty member is involved in some use of the KLS which operates as a multi beam station facility with up to 5 simultaneously delivered beams.



In an effort to take further advantage of this new area of research we hired Kristan Corwin as an Assistant Professor in August 2003. Kristan comes to us from Colorado NIST and was a student of Nobel Laureate Carl Wieman at the University of Colorado. Kristan is setting up a lab she calls LUMOS which stands for Lasers for Ultrafast Metrology and Optical Spectroscopy. She plans to work on precision frequency standards for optical systems and become involved in the JRML research program. Her lab is in a new room built within the so-called "square room," which previously housed tandem beam lines that have been moved to the LINAC hall.

We have also hired Igor Litvanyuk as an Assistant Professor who will join the faculty in January 2004. Igor comes to us from Paul Corkum's group at the NRC of Canada in Ottawa. He received his Ph.D. from Florida State University under the direction of Professor Michael Kasha. Igor plans to be a heavy user of the KLS in the study of laser-molecule interactions in the femtosecond time regime.

This is the year we have written a three year proposal for the renewal of our DOE umbrella grant, which for the last three years was funded at about 2.45 M$ per year. A team of four outside panelists, together with Dr. Eric Rohlfing and Dr. Dave Ederer from DOE, spent three days in Manhattan reviewing the program. The new funding resulting from this proposal and review is scheduled to begin in February 2004. At this time we are awaiting the recommendations.

There will be some additional changes in the upcoming year. I have decided that I should not overextend my stay as Lab Director and therefore decided to take a sabbatical in the spring of 2004 and then take advantage of the KSU phased retirement program. I am looking forward to this new phase of my life as a university faculty member. I have been PI of the DOE grant since 1974 and have been Director of the JRML since 1984. These have been wonderful years for me in which I have had the pleasure of working with so many great people in the JRML, the Physics Department, the University, and the Department of Energy. I treasure all the friendships that I have made through the years. One of the things that I am extremely pleased with is that Professor Lew Cocke will be taking over as JRML Director and PI of the DOE umbrella grant.

Our editor, Mick O'Shea is going to cut me off soon if I rattle too much longer. I can't stop, however, without saying that the AMOP group has done some outstanding new physics during the last year. Lew's group has done definitive experiments on the electron rescattering problem in intense short pulse laser-molecule interactions. Together with Professor C. D. Lin's group they published the experimental results and theoretical treatment in Phys. Rev. Letters. Other breakthroughs include Zenghu's and CD's work on ionization suppression and HHG extensions in laser-molecule interactions. Professor Itzik Ben-Itzhak's group has performed one of the first laser-molecular ion experiments and Professor Brett DePaola's group is pioneering an investigation of the dynamic behavior of atomic states in a Magneto Optical Trap using a method called STIRAP. My group is getting bold in attempting to measure image states in carbon nanotubes by a laser pump-probe technique, and will continue collaborations with Professor Theo Zouros from Crete on ion-electron collisions. Of further note, the research project of Timur Osipov, a graduate student of Lew Cocke's, on the isomerization of acetylene to vinylidene was featured in the August issue of Physics Today. Look it up.

Physics Education Research Group News

Kim Coy, Administrative Assistant

Life has been hectic in the Physics Education Research Group this past year both on and off campus! Sanjay Rebello worked with the High Energy Physics Group on KSU's QuarkNet project this past summer. This is an NSF- and DOE-funded program whose aim is to support science education in schools by establishing a nation-wide science teacher network. It provides opportunities for school science teachers to learn firsthand about frontline physics research, and establish mentor relationships between science teachers and physics professors at universities. Sanjay led sessions based on Visual Quantum Mechanics for the teachers participating this past summer.

Sanjay attended the faculty development Paradigms in Physics Workshop at Oregon State University in June of 2003. The workshop focused on two of the most broadly applicable Paradigms modular courses OSU has developed: Spin & Quantum Measurement and Energy & Entropy.

In addition, Sanjay gave an invited talk on "Physics Education Research as a Guide to Application-based Curriculum Development," at the Western Pennsylvania American Association of Physics Teachers Fall Section Meeting on October 24, 2003 at St. Vincent College, Latrobe, PA. He also conducted a Visual Quantum Mechanics workshop at the St. Louis

Association of Physics Teachers Meeting at Lindenwood College in St. Charles, Missouri on November 15.

Perhaps Sanjay's biggest endeavor of the year was hosting of the Joint Arkansas-Oklahoma-Kansas and Nebraska AAPT Section Meeting & Big 12 Physics Education Research Conference here at KSU on November 7 and 8. The meeting was a huge success and included Carl Wieman, 2001 Nobel Laureate as the banquet speaker. The meeting's keynote speaker was Len Jossem from Ohio State University and there were invited targeted posters on Physics Education Research from Noah Finkelstein, University of Colorado; David Meltzer, Iowa State University; Meera Chandrasekhar, University of Missouri-Columbia; Mark Plano Clark, Doane College; and Beth Thacker, Texas Tech University. There was also an invited targeted poster session on High Quality Physics Teaching in Rural America that included Valerie Otero, University of Colorado; Gay Stewart, University of Arkansas; Jim Johnson, Emporia State University; Paul Adams, Fort Hays State University. In addition, Dr. Alexa Pochowski, Assistant Commissioner of Education at the Kansas Department of Education presented a talk on the No Child Left Behind legislation.

Results of the group's research have been presented at a variety of meetings this year including the American Association of Physics Teachers Meetings in Austin, Texas this past January and in Madison, Wisconsin during August. On the international side, research was also presented at the Enrico Fermi School of Physics in Varenna, Italy during the month of July. This was a wonderful opportunity for Dr. Rebello to attend along with other members of the group to include Alicia Allbaugh, PhD graduate, Zdeslav Hrepic, PhD candidate, and Kara Gray, MS candidate.

Drs. Zollman and Rebello headed back to Italy in September to present talks at the GIREP Seminar on Quality Development in Teacher Education and Training in Udine. In addition, Dr. Zollman attended the International Commission on Physics Education (ICPE) Meeting in August in the Netherlands. The ICPE works to promote the exchange of information and views among the members of the international scientific community in the general field of Physics Education.

When members of PERG are here in the Little Apple, they have been quite busy. Dr. Zollman and his staff are hard at work on his Digital Libraries grant from NSF. The Physics Teaching Web Advisory (Pathway) is creating a proof-of-concept demonstration of a new type of digital library for physics teaching. Combining Carnegie Mellon University's digital video library technology with pedagogical advances developed at Kansas State University and with materials contributed by master teachers, the Pathway concept goes beyond simply creating a collection of teaching and learning materials. It provides continuously improving assistance and expertise for teachers and students of all levels. You can check out the Pathway website at www.physicspathway.org and find links providing more information or give Pathway a trial run!

Sanjay Rebello has continued work on his NSF-funded CAREER grant that is studying "Students' Mental Models, Learning and Transfer as a Guide to Application-Based Curriculum Development and Instruction." Interviews are being conducted on students' mental models by Sanjay, postdoctoral research associate Paula Engelhardt and PhD candidate Edgar Corpuz. This research has recently focused on sound, the bicycle and other devices that students use in their everyday lives. Development of instructional units focused on some of these applications and addressing multiple concepts is beginning to take shape.

Sanjay is also conducting research with Andrew Bennett of the Math Department on the NSF-funded project, "Assessing Student Transfer and Retention of Learning in Math, Physics and

Engineering Courses." Dr. Rebello and MS candidate Darryl Ozimek are conducting student interviews and designing surveys that investigate students' conceptual understanding in math courses and investigating student transfer and retention of learning from Engineering Physics to Statics and Dynamics and Electromagnetic Theory.

The group was lucky enough to have several prestigious visitors this past year. Professor Manfred Euler visited the KSU PERG for a couple of weeks in April. Dr. Euler is a faculty member at the IPN (Leibniz Institute for Science Education) in Kiel, Germany. He is working on the "Physik im Kontext" (*Physics in Context*) project at IPN.

Farhat Surve, APS Fulbright Scholar, conducted research with the group from April through August. Dr. Surve is a senior lecturer at Pune University in India. He spent his Fulbright year at SUNY Buffalo and Pennsylvania State University prior to his arrival at KSU. Dr. Surve worked on teaching methodologies related to the development of multimedia programs, video and audio integrated computer animation supplementing assimilation of concepts in physics and the Research on Learning & Education project in addition to programmed learning in physics laboratory courses during his time at KSU.

In addition, we hosted colloquium speakers Jose Mestre from the University of Massachusetts in the spring semester and Corinne Manogue from Oregon State University during the fall semester.

In personnel happenings, Brian Adrian joined the group as a research associate in August. Brian was previously a faculty member at Bethany College in Lindsborg, KS. He completed his Ph.D. in 1997 at the University of Nebraska-Lincoln under the direction of Robert G. Fuller. Brian is currently working on the NSDL grant for which Dr. Zollman has received NSF funding.

Salomon F. Itza-Ortiz has left KSU for a tenure-track assistant professor position at San Diego State University on the Imperial Valley campus. In addition, we congratulate Salomon who was married to Erin White on July 19, 2003. We wish them all the best in their new careers and marriage.

Alicia Allbaugh completed her PhD in 2003. She has accepted a Visiting Assistant Professor position at Rochester Institute of Technology and, in addition to her teaching responsibilities, is conducting research on the effect students' learning styles impact their learning with Dr. Scott Franklin.

Alice Churukian, 2002 PhD graduate in Science Education with an emphasis in physics education has begun a tenure-track position in the physics department at Concordia University in Moorhead, Minnesota, this past August.

Congratulations to former graduate student Lawrence T. Escalada and his wife, Alison, on the birth of their second child. Elena Delores Escalada was born on October 24, 2003.

Additional information about the group is available at http://web.phys.ksu.edu/.

Three Elected Fellows in American Physical Society

Three physics faculty members have been selected as fellows in the American Physical Society. Itzik Ben-Itzhak, Brett Depaola and Bharat Ratra were among the less than one-half of 1 percent of the international society's members to be recognized with fellowships this year.

According to the American Physics Society, the fellowship program was created to recognize members who have made advances in knowledge through original research, made significant contributions in the application of physics to science and technology or made contributions to the teaching of physics or to the society.

Ben-Itzhak is a member of the J.R. Macdonald Laboratory, an atomic physics group operating under a Department of Energy grant researching ion-molecule collisions.

Depaola was one of the first physicists to travel to Japan as part of a cooperative research program between K-State and a Japanese physics laboratory, RIKEN.

Ratra is in the middle of a five-year, $300,000 National Science Foundation grant to study experimental data generated by deep-space experiments to help determine the shape of the universe.

Itzik Ben-Itzhak

Brett DePaola

Bharat Ratra

With Three Winners, K-State Students Continue Ranking First Among Public Universities in Goldwater Scholarship Competition

Three Kansas State University students have won $7,500 Barry M. Goldwater Scholarships and a fourth nominee received honorable mention in this national scholarship competition. According to scholar adviser James Hohenbary, students winning Goldwater scholarships are Sarah Meyer, Aaron Wech and Jonathan Whitmer. Justin Dyer received honorable mention. Two of these students, Aaron Wech and Jonathan Whitmer, are physics students.

The Goldwater Scholars were selected on the basis of academic merit from a field of 1,093 mathematics, science, and engineering students who were nominated by the faculties of colleges and universities nationwide. One hundred sixty-one of the Scholars are men, 139 are women,

and virtually all intend to obtain a Ph.D. as their degree objective. Thirty-one Scholars are mathematics majors, 210 are science majors, 45 are majoring in engineering, 12 are computer science related majors. Many of the Scholars have dual majors in a variety of mathematics, science, engineering, and computer disciplines.

K-State President Jon Wefald said, "K-State students have won 48 Goldwater scholarships since the program began in 1989, ranking our students first in the nation among public universities in America in the number of Goldwater winners. This is an incredible achievement for a state university, and attests to the strong work ethic of our excellent students and the dedicated faculty members, who mentor them."

Wefald said that among all colleges and universities in the nation, only Princeton with 51 winners and Harvard with 50 have produced more Goldwater scholars. Duke University is tied with K-State with 48 winners.

The one and two year scholarships will cover the cost of tuition, fees, books and room and board up to a maximum of $7,500 per year. Meyer will receive one year of funding, Wech and Whitmer will receive two years of scholarship support.

Wech, **Hill City**, is a is a senior in physics and mathematics. He plans to earn a doctorate in atomic physics and conduct theoretical research in industry or at a national laboratory before pursuing a career as a university professor.

At K-State, Wech is a member of the Physics Club, and was a participant in the 2002 Physics Research Experience for Undergraduates program. He also conducts atomic, molecular, optical physics research with professor Lew Cocke. A McNair Scholar, he is a member of Golden Key International Honor Society and Phi Kappa Phi honor society. He has received a KSU Foundation Scholarship, an Engineering Scholarship, James R. Macdonald Memorial Scholarship, Dane G. Hansen Scholarship and a Rush Foundation Scholarship. A 2000 graduate of Hill City High School, he is the son of Jean Greggs, **Chesterfield, N.H**., and Gregory Wech, **Chippewa Falls, Wis**.

Whitmer, **Wilson**, is a senior in physics and mathematics. He plans to earn a doctorate in physics/condensed matter and conduct research in condensed matter physics at a research university. He plans to study nanoscale phenomena, with possible applications regarding the development of techniques for creating advances in materials and nanotechnology devices. He is active in the Physics Club, and does research with professor Bruce Law and the liquid surface physics group. Last summer he attended a research experience for undergraduates at the University of Illinois, and performed condensed matter physics research. He received the Robert C. Byrd Scholarship, the Dane G. Hansen Scholarship, Elks Scholarship, Engineering Scholarship and the Putnam Scholarship to attend K-State. A 2000 graduate of Wilson High School, he is the son of Alice and Eldon Whitmer.

Goldwater Scholars Top 10 of the 2,000 four-year colleges in America: 500 state; 1,500 private.

1. Princeton University 51
2. Harvard University 50
3. *Kansas State University 48

4. Duke University 48
5. California Institute of Technology 44
6. University of Chicago 42
7. *Penn State University 42
8. *University of Illinois-Urbana 40
9. Cornell University 39
10.*Montana State University 39
* denotes state schools

Web address for more information:

http://www.mediarelations.ksu.edu/WEB/News/NewsReleases/accomplishmentsindex.html

Alumni in the News

Dr. Douglas S. Gale: Douglas set up a small information technology consulting firm last fall and moved to Big Sky last summer. Henrietta telecommutes for a company in DC and Douglas does consulting assignments as needed.

doug@galefamily.com (personal) www.galefamily.com

dgale@itassociates.org (professional)

www.itassociates.org

Associate Professor Jackie Spears: Jackie serves in the faculty senate at K-State and is on the faculty in secondary education. She also instructs in Women's Studies program. She was presented with a plaque of appreciation for her exemplary leadership of Academic Affairs for the past two years.

William J. Spencer was named you the recipient of the 2003 IEEE Ernst Weber Engineering Leadership Recognition Award with the following citation: "For engineering leadership in raising performance in semiconductor manufacturing and fostering cooperative work towards international standards."

Graduate Degrees Awarded

Masters:

- Mahendra Man Shakya (Zenghu Chang) "Development of an Ultrafast Accumulative X-Ray Streak Camera" (Ph.D., KSU)

Ph.D's:

- Alicia Allbaugh (Dean Zollman) "The Problem Context Dependence of Students' Application of Newton's Second Law," Visiting Asst. Prof., Rochester Int. of Tech.
- Dan Fry (Amit Chakrabarti) "Aggregation in Dense Particulate Systems," Polymer Division, NIST
- Erge Edgu-Fry (Lew Cocke) "Single Electron Capture and Ionization Involving Atomic (and Moleculr) H and HE at Low to Intermediate Impact Energies," Physics Division, NIST
- Chandana Ghosh (Talat Rahman) "Atomistic Studies of Manipulation, Growth and Diffusion on FCC Metal Surfaces," Post-Doc, Math, Iowa State Univ.
- Teck Lee (Brett DePaola) "Theoretical Investigations of Inelastic Processes in Slow to Fast Ion-Atom Collisions," Phys. Div., Oak Ridge
- Jing Li (Hongxing Jiang) "AlGaN Alloys and Heterostructures--Growth, Characterization and Application," Vist. Sci./KSU
- Hai Nguyen (Brett DePaola) "Magneto Optical Trap Recoil Ion Momentum Spectroscopy," Post-Doc, Univ. of Paris Sud
- Chris Verzani (Brett DePaola) "Single and Double Electron Capture Cross Sections at Very Low Collision Energies," NIST
- Mikhail Zamkov (Pat Richard) "Multi-Electron Processes in Ion-Atom Collisions," Post-doc, KSU

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