



University of Virginia Physics News

Volume 3, Number 1

Fall 2009

Young Investigator Awards

Newly hired faculty in the department have been quite successful in recent years in obtaining grants to help jumpstart their careers. The federal Department of Energy has the Outstanding Junior Investigator (OJI) Award and the National Science Foundation has the Faculty Early Career Development (CAREER) Award. There are slight differences between these two prestigious awards, but both are given to less than 20% of those applying. They are designed to support the early career-development activities of teacher-scholars to effectively integrate research and education. Restricted to non-tenured assistant professors in our case, they are almost always the first independent research funding an assistant professor receives and give them direct control over research funds to increase their independence and scope in formulating and pursuing their own research early in their academic careers.

During the current year four faculty members have used these awards in physics:

◆ Jongsoo Yoon obtained a NSF CAREER award from 2003-09 for “Heat Capacity Study on Low Dimensional Electronic Systems at Low Temperature”.

◆ Nilanga Liyanage obtained a DOE OJI award from 2003-10 for “Study of the Neutron Spin Structure Using Jefferson Lab Hall A Polarized ^3He Target”.

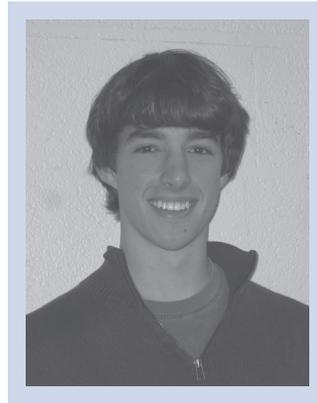
◆ Kent Paschke received a DOE OJI award from 2007-10 for “Precision Electroweak Studies at Low Q^2 Using Parity-Violating Electron Scattering”.

◆ Austen Lamacraft received a NSF CAREER award from 2009-14 for “Dynamics & Statistical Mechanics of Multicomponent Quantum Fluids”.

Matching Gift

In an effort to grow the Bascom S. Deaver Scholarship Fund, Physics Department alumnus William L. Goodman (Ph.D., 1970) is pleased to announce a challenge to his fellow alumni who benefited from the teaching and mentoring of Professor Deaver throughout his career. Mr. Goodman will match all new gifts to the Fund made in the next twelve months, up to a total of \$75,000. This challenge provides an opportunity to double the impact of your gift to honor Professor Deaver and perpetuate his legacy through generations of Physics students to come. To make a gift and take advantage of this matching opportunity, please visit the Fund website at <http://www.phys.virginia.edu/Announcements/DeaverFund/>.

First Deaver Scholarship



Sherwood Richers III is the first recipient of the Bascom S. Deaver Scholarship established by alumni and faculty as well as friends and family of Deaver to recognize his service of more than 40 years to the department. Sherwood, a 3rd year student majoring in Astronomy-Physics, commented that “It’s the physics that interests me, but the physics of

the most extreme conditions in the universe and the physics of an area of science that we know so little about that really gets me on my toes”. We couldn’t say it any better!

Sherwood is from Woodbridge, VA and went to the prestigious Thomas Jefferson High School for Science and Technology. He has a second degree black belt in Tae Kwon Do and has been spending a lot of time rock climbing for the past year. He has two uncles with physics degrees and a scientist father, so it seems to run in the family. He hopes for a research/teaching career.

Letter from the Chair

Dear Alumni & Friends,

I usually highlight recent developments in the department. This time I will focus instead on a profound change that has taken shape over the past twelve months. In a series of budget cuts, the state revenue contribution to our University has dropped by about a third (or about 15% of the Physics fixed operating budget), thus doubling the total cut since 2002. These permanent cuts will not be restored even after an economic recovery. Although nominally a public institution, the University, and Physics with it, is undergoing a transition to a funding mode dominated by tuition and philanthropy, with negligible state revenue support. This new era will bring considerable challenges, but also some opportunities. One thing is certain: if they are to survive and thrive, Physics and the University will rely more on, and forge a closer relation with, our current and former students, as well as with our friends at large. We hope this change in our relationship will usher in a new era of excellence in teaching, research and service.

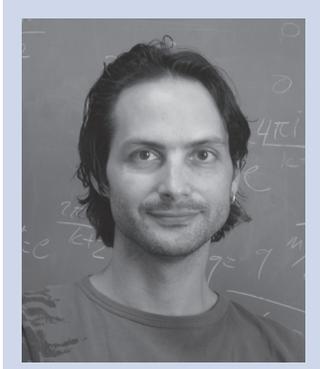
Dinko Počanić



New Faculty Spotlight

Israel Klich

Israel Klich joined the department in August 2008 as an Assistant Professor specializing in condensed matter theory. He was born and educated in Israel with his undergraduate and graduate degrees from the Technion (Israel Institute of Technology). He held postdocs at both Cal Tech and UC – Santa Barbara (Kavli Institute for Theoretical Physics) before arriving in Charlottesville. He held the prestigious Sherman Fairchild Prize Scholarship at Cal Tech from 2004-2007.



Klich's recent research has used the Casimir force to study fluctuative forces. The Casimir force is a striking phenomenon arising from the zero point fluctuations of fields. Such forces have gained renewed interest in the last decade and involve active experimental research with possible nanoscale technological applications.

He is also investigating entanglement structure of many body systems. Entanglement and transport may have significant importance as a possible resource for quantum information processing. In addition, high entanglement entropy fundamentally affects the possibility of using numerical techniques to investigate phase transitions.

In his spare time Israel plays flamenco and jazz guitar on a professional level. After spending the past few years playing in the LA area, he is pleasantly surprised to discover a vibrant music community here in Charlottesville. These days he is collaborating with local musicians and performing regularly around Charlottesville.

Christopher Neu

Chris Neu joined the faculty as an assistant professor in experimental particle physics in August 2008. He began working on collider experiments at Fermilab even before graduating with joint math and physics degrees from the University of Illinois in 1998. He did his graduate work at Ohio State Uni-



versity and went to the University of Pennsylvania as a postdoc in 2003 where he continued to work at Fermilab. Upon joining UVa, Chris designed his research program to focus on the new Large Hadron Collider (LHC) at the European particle physics lab CERN. Chris is spending the fall semester at CERN where he is preparing for the first collider run of the LHC, scheduled to begin soon.

While working at Fermilab, Chris participated in several searches for the Higgs boson. His major contributions include development of b quark jet identification tools. In addition to enabling the search for the Higgs boson, these tools help probe top quark physics, QCD interactions, and other searches for new phenomena. While these searches at Fermilab have so far not yielded a discovery they have probed a significant range of possible Higgs mass values and helped guide the way for future searches.

Neu is involved in several projects at CERN, including preparing the CMS crystal electromagnetic calorimeter (ECAL) for data operations. This device measures the energies of photons and electrons that are produced in LHC collisions. His research will focus on measurements of the properties of the top quark, the production of W bosons and b quarks and searches for the Higgs produced in association with top quarks. Chris says "The entire particle physics community is eager for the beginning of LHC operations. I am excited to be here on the ground at CERN, to be part of the action. There is so much to do in preparing the CMS detector for beam, establishing operations and readying our early analyses. It has been a great experience for me and my research."

Chris and his wife Laura have one child and a second on the way. The entire family is at CERN this semester. A native Chicagoan, the move to Virginia provided his first experience living near mountains. He enjoys hiking, golf, Fridays after Five on the downtown mall, and following his beloved Chicago White Sox.

Physics Major Recruitment

The Physics Department continues to graduate large numbers of undergraduate majors, possibly 50 this year; about 50% are double majors. A TV monitor is being installed near the second floor labs to help recruit additional majors. We would like to post interesting career paths of our own graduates. Please email details of your interesting career to PhysicsCareers@virginia.edu.

Please send address changes, comments and suggestions about the newsletter to
physicsnewsletter@virginia.edu

Honors and Awards

Undergraduate Students

The Most Outstanding Undergraduate Major Award in Physics was given to **Jennifer Ann Cano** in 2009. A Jefferson Scholar and a Goldwater Scholar at UVa, Jennifer graduated in May 2009. She is doing her graduate studies at UC-Santa Barbara in physics.

Thiparat Chotibut won the Outstanding Undergraduate Physics Research Award for 2007-2008. His research in detector configuration was directed by Professor Blaine Norum. He graduated in May 2008 and then received a M.A. in math in 2009. Thiparat is now at Harvard in the physics graduate program.

Rachel Hodges won the Outstanding Undergraduate Physics Research Award for 2008-2009. Her research on measuring local surface potential inhomogeneities was supervised by Professor Stefan Baeßler. Rachel graduated in May 2009 and is studying graduate physics at Michigan.

Graduate Students

The departmental outstanding teaching award for 2009 was given to **Hussain Zaidi**.

Faculty

Michael Fowler received the 2008 George B. Pegram Award from the Southeastern Section of the American Physical Society for "excellence in teaching physics at all levels, outreach efforts and global influence on physics teaching through his website".

Despina Louca received a fellowship from the Tohoku University (Japan) Advanced Institute for Materials Research for summer 2008.

Faculty News

Promotion

Seunghun Lee was promoted to Full Professor.

New Faculty

The following joined the faculty in 2008:

Israel Klich, Theoretical Condensed Matter Physics

Christopher Neu, Experimental Particle Physics

Retirements

Professors **Sergio Conetti** and **Paul Fishbane** retired in January, 2009.

Thomas Gallagher

Explorer on Foot, in the Lab and at Home

Yes, Tom Gallagher still walks to work 1.8 mile each way on the days he does not ride his bicycle. No, he does not have a UVa car parking permit. And he is one of the most honored and prolific researchers in the physics department. Among his many awards include membership in Phi Beta Kappa, Fellow of the American Physical Society and Optical Society of America, and the Outstanding Scientist of Virginia in 1997. His most prestigious award is the Davison-Germer Prize of the American Physical Society in 1996. He has almost 270 publications in refereed journals. Perhaps most meaningful to the department, he holds the Jesse W. Beams Chair in Physics.



Tom grew up in Aurora, Illinois and obtained his B.A. from Williams College in 1966, and his M.A. in 1968 and Ph.D. in 1971 from Harvard, all in physics. He spent several years at SRI (formerly called the Stanford Research Institute) in Palo Alto before arriving in Charlottesville in 1984 as Professor of Physics. He served as chair of the department from 2000-2005. He has supervised the theses for six masters degree students (Kevin Dietrick, James Collins, Timothy Scholz, Litang Cai, Chang-Jian Dai, and Quishan Sun) and 27 Ph.D. students (Yifu Zhu, Clinton Carlisle, James Dexter, Haris Riris, Christopher Mahon, Robert Jones, David Thomson, Dimitris Papaioannou, Michael Renn, Chung-Yi Lee, Chen-Hsiung Cheng, James Veale, William Anderson, Bifford Lyons, Robert Watkins, Derek Duncan, Michael Davis, Warren Griffith, John Lowell, Lung Ko, Elena Murgu, Victor Klimenko, Michael Robinson, Michael Bajema, Wenhui Li, Edward Shuman, and Jianing Han). He currently has five graduate students working in his lab. Tom remarked that "Looking at this list I can see why I have had such a good time for the last 25 years. These guys are great, and working with them has been a blast." It is no wonder that Tom has three research grants from DOE, NSF, and AFOSR to support his continuing research in Rydberg and other excited atoms.

Tom's primary hobby is working on his three cherished sports cars (66 MGB, 66 Triumph TR4A, and 65 Triumph TR4). Woodworking also takes up his spare time – especially building dashboards for three cars. Tom and his wife Betty have enjoyed several spring trips to France where Tom has research colleagues. They hiked for five days in France's Loire Valley this year carrying everything they needed on their back while passing through vineyards, flowers, and green hills dotted with chateaux.

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Ralph Minehart

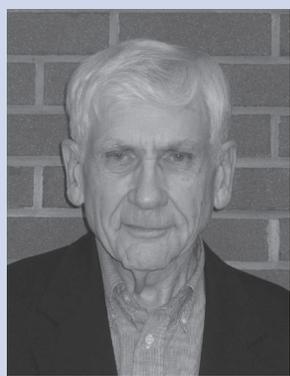
Music, Travel, and (still) Research

Ralph Minehart left the South Dakota plains and went off to college at Yale ('56), graduate studies at Harvard (M.A. '57, Ph.D. '62), and postdoctoral studies for Yale at Harvard/MIT. He did his Ph.D. research on the Harvard cyclotron and his postdoctoral research on the Cambridge Electron Accelerator. In 1966 he joined UVa's newly-formed medium energy nuclear physics group. Although he retired in 2005, he continues to do research at Jefferson National Laboratory, the facility started by UVa more than 25 years ago. He produced nine Ph.D. students: Richard Kerns, Richard Barrett, Jonathan Boswell, Dennis Roeder, Cole Smith, Leigh Chinitz, Todd Averett, Yelena Prok and Renee Fatemi.

Minehart and his wife Jean continue to live in Charlottesville in the same house they moved into in 1966. Jean retired a year after Ralph, following 24 years working as a tax accountant. They have four children with diverse careers, a biologist, an economist, an executive in the entertainment industry, and a dentist. They have four grandchildren.

While at UVa Minehart worked at NASA's Space Radiation Effects Laboratory in Newport News, using the pion and muon secondary beams produced at the proton synchrocyclotron accelerator. Beginning in the early 1970s, Minehart focused his research for several years at LAMPF in Los Alamos and spent summers there enjoying the beautiful scenery in New Mexico while doing pion physics. He did similar research at the Paul Scherrer Institute (PSI, formerly called SIN, Swiss

Institute for Nuclear Physics), which began operation in 1974. The PSI cyclotron, located near the village of Villigen about 30 miles from Zurich, produces 590 MeV protons of high intensity, which subsequently produce pions and neutrons for nuclear physics research and therapy. He spent a sabbatical year at PSI in 1975-76, living with his family in Zurich. The accelerator remains in operation today.



Minehart also spent a sabbatical leave at the Stanford Linear Accelerator in 1986-87, where he and the UVa group had a significant nuclear physics research program. He did research for several years at SLAC prior to the opening of the Jefferson National Laboratory (JLAB) here in Virginia. He was one of the first chairs of the Users Group at CEBAF, the former name of the Jefferson Lab, and was chair of the CLAS group in Hall B. Minehart continues to do analysis on JLAB experiments including the scattering of polarized electrons from polarized NH_3 and ND_3 targets.

Ralph and Jean have always enjoyed musical performances in Charlottesville and elsewhere. Locally, they enjoy the Chamber Music Festival, the Tuesday Evening Concert series, the Charlottesville-University Symphony and the Virginia Opera in Richmond. Travel is a significant part of their retirement, with a trip to China last year and a visit to Egypt this fall. Ralph volunteers to read for Recording for the Blind and Dyslexic. We see Ralph every week at the Friday colloquium.