## Pittsburg State University Physics Department

Fall 2011 www.pittstate.edu/phys

uark

## In this issue-

We are pleased to feature another graduate of the PSU Physics Department in The Quark. As a PSU Physics alumnus, we hope that you enjoy reading their stories. We want to hear from you, too. Please send us a postcard or email! Editor's Note: I first learned of John Flater as I was helping with the annual fund-raising event for PSU. We started talking on the telephone and it was the best call I made all night. I think that you will find John's story an interesting one! –Dr. David Kuehn

## AnAutobiographical Sketch

#### by John Flater, (BS '54)

My association with KSTC (Kansas State Teachers College, now Pittsburg State University) began in June 1933 when I was born in my maternal grandparents' house one-half block off campus. Their home at 1809 S. Joplin was next door and south of President Brandenburg's house. Today the north part of the Alumni Association building occupies their house lot and the one south. My grandfather became chief engineer and in 1920 was promoted to Superintendant of Buildings and Grounds at KSTC and he had that position until retiring in 1947. When my mother and father married in 1932, they established home on a farm two miles southeast of the town of Farlington. She recorded in a book that the first 16 words I learned included: car, tractor, spark plug and book. Appropriate for a farm boy and future physics graduate!

Formal education began with first grade when five years old (no kindergarten) in a one-room rural school near my home. One teacher taught all eight grades and we never had more than 16 students total. There was always homework to do and fortunately we had electricity at home for this after evening chores were done. Classes were for only eight months (September through April) so we could help with the spring farm work. Between eight and 12 years old, I would spend one or two summer weeks with my grandparents in Pittsburg. I would accompany grandfather as he went to work on campus. We went into the boiler room for an operations check on the two huge coal-fired furnaces tended by the firemen. From the boiler room we would go to any one or several of the campus buildings to check on maintenance and custodial activities,

## An Autobiographical Sketch (from pg. 1)

and would occasionally stop by the President's office to report status or get new job requests. I was probably more familiar with all the buildings than most faculty members.

In Girard High School, my classes in basic algebra, plane and solid geometry, plane and spherical trigonometry and fundamentals of physics were not typical for Kansas high schools in the late 1940s. But our woman principal had a strong college math education and taught most of these as elective classes. At age 16, I graduated 2nd in my class of 64 students and was offered a tuition scholarship by the KSTC College YMCA.

In September 1950, I enrolled at KSTC for a major in physics and a minor in mathematics and moved into one of my grandparent's spare bedrooms. We always had plenty to eat but cash was limited so I worked during the summer to earn tuition and room rent for the next year. In three summers this included farm work, then operating a large "sheep foot" roller on a highway K-7 rebuild, then finally driving a 4-ton dump truck to haul 12-ton loads of crushed coal to regional electric generating plants.

Scheduling the mandatory physics and math classes was a challenge with my on-campus work hours and limited instructor availability in those early years of the Physical Science department. Dr. L.C. Heckert solved the challenges of professors on sabbatical leave and graduating student assistants and helped me succeed with some help from Professor Helen Kriegsman in the Math Department. I reached my goal by taking three elective summer session classes in 1954 to meet total hours required for a degree.

After receiving my BS degree, I wanted to complete graduate level studies, get a PhD and become a physics professor. But my educational exemption from the selective service draft had ended and I was near the top of the call list! I had no money for graduate level education and no employer would offer me a meaningful job when I could be drafted before I settled into a job. The Korean War GI Bill was due to expire at the end of February 1955 and it offered a way to get more funds for graduate level study so I enlisted for two years of army service.

After advanced training at the Anti-Aircraft and Guided Missile Center at Fort Bliss (in El Paso) Texas, I became an instructor to train replacements for 90-mm anti-aircraft gun crews. Gun sites were in Alaska, on the northern U.S. border, in South Korea and also Puerto Rico (during early years of Fidel Castro threats) until Nike anti-aircraft missiles were fully developed and deployed. My first computer experience was a van mounted "hard-wired" unit to track aircraft targets and control the guns.

The computer used radar tracking data to derive flight vector data for aircraft

targets. A weather system also input wind speed and direction, air temperature and humidity. Azimuth and elevation commands used to point the gun barrel went through electrical cables to the gun mounts. Gun muzzle projectile velocity from prior tests, the weather data and radar measured target distance was used to calculate a projectile's time to target. Just before it was fired, a "time to target" was input to set a timed fuse for each projectile's explosive charge. A battery of four gun platforms was set to place a box of shrapnel from the four exploding 23 pound projectiles around the target in the middle of an aircraft squadron. Normal firing rate was 23 rounds per minute, but a highly trained crew could achieve 28 rounds per minute in critical situations. As a physicist, you have to admire this ultimate gunnery problem solution.

#### John Flater

John Flater (BS, Physics, Pittsburg State University, 1954) worked from 1957 to 1992 in various engineering and management capacities with Martin Marietta Corporation in all phases of large-scale aerospace vehicle hardware systems and computer system engineering on more than a dozen diverse projects. This included conceptual system architecture definition, through detailed software development, and integrated system launch and flight test operations followed by post test analysis. Projects included Titan I and Titan II ICBMs, Titan III Space Launch system, Viking Mars Lander, Venus Orbiting



Imaging Radar, Large Space Telescope, Navy Ocean Surveillance Information System, Navy Integrated Tactical Surveillance System, Communications Nodal Control Element of the Tri-Service Tactical Communications Control Facility, a NASA Programming Language for Allocation and Scheduling (PLANS), corporate funded Independent Research and Development (IRAD) projects, and several highly classified intelligence and surveillance data processing systems. John and his wife June live in Littleton, Colo.

# Faculty Updates

#### Dr. Chuck Blatchley, Ph.D.

(Louisiana State University, 1984) Dr. Chuck Blatchley has continued to serve on the Kansas Board of Education Program Review team and the Secondary Education Coordinating Committee. He is currently collaborating with faculty in the College of Technology on a book chapter on nanomaterial safety. Experiments with High Purity Germanium (HPGe) and NaI(Tl) gamma spectroscopy have failed to find any evidence of an astrophysical radiation event in the local geological record, although isotopic ratios of boron in coal are consistent with at least one such possibility. Work with the NaI(Tl) system resulted in a first place award for undergraduate research last year. Dr. Blatchley is also still an Adjunct Professor at the University of Nebraska Medical Center in Omaha in the Department of Orthopaedic Surgery and Rehabilitation, where he has continued his collaboration with Professors Fereydoon Namavar and Hani Haider at the Scott Technology Center at UNMC, developing and testing new wear resistant materials for biomedical implants.

#### Dr. David Kuehn, Ph.D.

(New Mexico State University, 1990) Dr. Kuehn continued development of the software for the Acousto-Optic Tunable Filter Spectrometer with the New Mexico State University's Departments of Astronomy and Electrical Engineering. He visited their laboratories in May/June 2010 for three weeks as well as for a few days in December 2010 and March 2011. A source of noise in some signal lines was causing some troubles with the interface, but these have finally been resolved. The goal is to shrink the system down to the size of a brief case (or a bread box) so that the system can be used on a remotely-operated rover on Earth or other planets. Dr. Kuehn taught a new course in Computational Fluid Dynamics in the spring 2010 semester.

The main goal was to teach students how to numerically solve the Navier-Stokes equations for a variety of cases.

He also worked with BSEd student Shea Smith through a PHYS 540 Topics in Physics course to develop and test low-cost versions of physics lab experiments that she can use when she starts her teaching career after graduating this past May. Dr. Kuehn attended the PhysTEC (Physics Teachers Education Coalition) Conference in Washington, D.C. on Feb 12-13, 2010. He attended workshops directed at the recruitment and training of students to teach high school physics. The PSU Physics Department is a new member of this coalition as of 2010. He also attended the American Association of Physics Teachers (AAPT) meeting in Jacksonville, FL in Jan 2011 where he presented a paper about a new astronomy lab exercise he developed using web-cams and diffraction gratings. He also attended the Lunar and Planetary Science Conference (LPSC) in Houston, Texas, in March 2011.

Dr. Kuehn is working with two PSU Physics students, Qiang "Shaun" Xiong and Gyuhwan Kim, in the development of two meteor cameras. These cameras use Watec ultra-low light-level infrared video cameras combined with a widefield, auto-iris optical system and software that looks for meteors as the camera continuously monitors the night sky. Not only do the cameras have the possibility of gathering quality imaging data, Kuehn plans to involve local school districts in the collection and reduction of the data to increase local science and mathematics achievement.

#### Dr. Serif Uran, Ph.D.

(Illinois Institute of Technology, 2000) Dr. Uran has been teaching in the PSU physics department for seven years. In addition to teaching his regular course load, he taught a new advance topics course, "Solid State Electronics", which was taken by both graduate and undergraduate students in fall 2010. He also taught College Physics I and Engineering Physics I combination course with ninety nine students attended.

Dr Uran and a couple of his graduate students (Tai-Yun Huang and Tushar Despande) attended the 56th Midwest Solid State Conference, University of Oklahoma, Norman Oklahoma, and presented their work on Giant Magnetoresistance (GMR) materials in fall 2010. Dr Uran brought five students to a conference at University of Arkansas - IDeA Network of Biomedical Research Excellence (INBRE) where students presented posters in fall 2010. Dr. Uran collaborates with Honeywell – Kansas City plan on GMR materials. He also reviews grant applications to the U.S. Civilian Research Institute.

Dr. Uran served as a poster and panel judge at PSU Undergraduate/Graduate Research Colloquium, where new research projects from physics department as well as other departments were presented in springs 2011. He served as a poster judge at the 22nd Annual Missouri Southern Regional Science fair at MSSU in spring 2011. He also serves in various subcommittees of the PSU Faculty Senate and is a member of the Outstanding Senior Student Selection committee. Also, Dr. Uran started to serve as PSU - Kansas National Education Association (KNEA) parliamentarian since August 2010.

Dr. Uran has been supervising the Society of Physics Students (SPS) student organization since he came to the PSU. The SPS is a national and academic student organization which promotes physics and physics education. The PSU chapter of the SPS is in Zone 12, which includes Kansas, Oklahoma and Missouri. Science education via student organizations such as Society of Physics Students (SPS) is an important part of university experience.

#### Dr. Rebecca Butler, Ph.D.

(Ohio State University, 2002) Dr. Butler received tenure and was promoted to Associate Professor at the beginning of this year. She enjoyed teaching Modern Physics for the first time this spring. Since its one of the first "real" physics classes a physics major takes, she worked hard to try to make it an interesting experience. Also this spring she started a brand new class, Advanced Physics Lab, for graduate students. It was run in conjunction with the Intermediate Physics *continued*  Lab for undergraduates; with the idea that the graduate students would be designing experiments the undergraduates could then do either that year or the next. Two of the main projects for them were to design a Hall Effect experiment and to computerize the Franck-Hertz experiment.

Another new experience for Dr. Butler was reviewing chapters from a textbook for a publisher. Having taught College Physics II for several years now from the same text, she felt it was interesting to see authors' new ideas for presenting the material. She hopes she was able to give good feedback and ideas from her own experiences.

Dr. Butler taught a summer session class for the first time this summer, Physical Geology. It was quite an experience to condense a semester of class into four weeks in July! She continues to enjoy teaching the class regularly in the fall semester and being involved in activities such as the Rock Recognition competition for the Science Day for high school students.

She continues her research on molecular spectral analysis, collaborating with spectroscopists from the Jet Propulsion Laboratory and the Ohio State University.

#### Kyla Scarborough, MS

(PSU, 2005)

Ms. Kyla Scarborough has been teaching in the P.S.U. Physics department since fall 2005. Last fall she taught Descriptive Astronomy, Physical Science, and supervised the Physical Science labs. Kyla's teaching assignment for the spring semester included Physical Science, Descriptive Astronomy, Planetary Atmospheres and supervising the Physical Science lab sections. She supervises the L. Russell Kelce Planetarium, which presents programs to a few thousand students annually. Kyla has been training a new student employee to assist with planetarium programs. Ms. Tristan Doane is pursuing a Pre-Medical degree from the Biology department and is an astronomy enthusiast! Both Kyla and Tristan are enjoying recent upgrades

to the L. Russell Kelce Planetarium, which include a new computer and monitor, and a much-admired Canon REALis SX80 projector. Kyla organized the Physics Frolics and Earth & Space Sciences portions of PSU Science Day 2011. Her research interests have included wear testing of biomedical implants and engine parts and also vertical structure modeling of Saturn's upper atmosphere from narrowband nearinfrared imaging.

#### Dr. Alexander Konopelko, Ph.D.

(Tomsk University of Technology, 1990) Dr. Konopelko is a third year Assistant Professor in the Physics Department at PSU. He was teaching four classes in fall 2010 and in spring 2011. These courses include Physical Science, Introductory Astrophysics, Modern Physics (Part II), Mathematical Physics, and Astronomy Laboratory. In spring 2011, Dr. Konopelko taught for the first time the course in Engineering Physics (Part II). This required a lot of work in developing the ANGEL quizzes and assignments; electronic manuscripts of the lectures; examination questionnaires. One new laboratory exercise has been added to the Astronomy practicum in fall 2010. Dr. Konopelko supervised three graduate students at the Department of Physics, Yu Bo, Xiong Qiang, and Nathaniel Smith. In January 2011, Yu Bo moved to the Southern Illinois University in Carbondale, where he accepted the PhD program in Mechanical Engineering. Xiong Qiang and Nathaniel Smith are doing research in Astrophysics at PSU.

In fall 2010, Dr. Konopelko actively participated in the major PSU enrollment event- "Rumble in the Jungle". In 2010-2011, Dr. Konopelko continued to maintain the information email list for the four-state physics teachers. Dr. Konopelko sponsored the visits of two speakers at the Department of Physics. Dr. Bharat Ratra from Kansas State University presented an update on the status of Modern Cosmology. Alan Glines was talking about his experience as a long-time employee at the NASA Space Control Center in Houston, Texas, and the European Space Center in Darmstadt, Germany (see figure below). More than 70 PSU students and faculty attended this seminar. Dr. Konopelko supported a trip of three physics students to the Wichita State University to attend the colloquium given by a Nobel Prize winner Prof James Cronin from the University of Chicago.

High-Energy Astrophysics and Astroparticle Physics are research areas of Dr. Konopelko. He is currently involved in a number of large international collaborations constructing and maintaining the ground-based detectors of cosmic rays. Among those is the

continued



Alan Glines in the Apollo Mission Control Room (Courtesy of Alan Glines).



Illustration of AGN (Active Galactic Nucleus) like Mrk 421 (Credit: blogs.zooniverse.org/ galaxyzoo).

VERITAS (Very High-Energy Radiation Imaging Telescope Array system), which is a major observatory for gammaray astronomy in Arizona. The CTA (Cherenkov Telescope Array) project is a system of as many as 50 gamma-ray telescopes to be built in Namibia. Dr. Konopelko represents PSU in the Pierre Auger consortium, which is a world-class research facility proposed to be build in southeastern Colorado and southwestern Kansas. This project involves about 400 scientists from more than 70 universities in 17 countries.

In May 2010, Dr. Konopelko attended the 216th American Astronomy Society meeting in Miami, Florida, where he presented the recent results on "The Broadband Multi-wavelength

Observations of high-energy blazars Mrk 421 and Mrk 501 in 2009-2010." Blazar Mrk 421 is a black hole in a distant galaxy (see figure below). In November 2010, Dr. Konopelko was invited for the Colloquium talk at the Department of Physics at Wichita State University to discuss the recent scientific results obtained with VERITAS. Dr. Konopelko served on the review panel for the Cycle IV Guest Investigator Research program with the Fermi-LAT in Baltimore, Md. In January 2011, Dr. Konopelko and two physics students, Dongqing Huang and Xiong Qiang, attended the VERITAS meeting in Tucson, Ariz. Dongqing Huang gave a joint presentation on observations of blazars.



This past July, Mike Hudson, a former student at PSU and his three brothers, Jerry Hudson, David Hudson, and John Hudson (all PSU alums), presented President Steve Scott with an autographed photograph of the Expedition 24 crew of the International Space Station. Mike Hudson works for NASA in Houston in support of the International Space Station and obtained the autographs on the photo. Seen from left to right accepting the gift for the PSU Physics Department is Dr. Karl Kunkel, Dean of the College of Arts and Sciences, Dr. Tim Flood, Chair of the Departments of Mathematics and Physics, Dr. David Kuehn, Professor and Assistant Chair of the Physics Department, and Dr. Steve Scott, President of Pittsburg State University.

## Society of Physics Students (SPS) Activities

#### -2010-2011 school year

PSU-SPS elected new officers at the start of the school year, Dong Qing Huang (physics senior) became the president and Charini Wanigarachchi (physics sophomore) became the vice president. Michael Urteaga was elected to be the secretary and treasurer of the club.

The group had a remarkable year with a lot of on campus community and national activities:

Our Chapter received the Marsh W. White Award of \$300 from the national Society of Physics Students for our outreach program. The club spent the money for buying new demonstration equipment which will be used in various on and off campus demonstrations.

Our chapter presented their Hologram research to PSU Student Organization Committee and was able to secure funding for their hologram research supplies. Materials for making holograms were purchased and they made their first holograms in the early part of the spring 2011 semester.

Our Chapter applied for Blake Lilly Prize (three volumes of Feynman's Lectures). Although they did not win it, they got a consolation price of the "Handbook of Physics". It is a great book with lots of useful information for a physics undergraduate student.

Our chapter attended the annual SPS Zone 12 meeting at William Jewel College at Liberty, Mo. SPS students got to see a "Holtz machine" demonstration by a retired faculty member. They had a great time and enjoyed the guest speaker, and the next day they presented their research on holograms. The event ended playing with rockets that William Jewel provided.

Our chapter participated Campus Club Day. This event gives students a chance to get out and see what clubs are out there at Pittsburg State University. Our club sometimes can attract students from other clubs on campus.

## Student News

### Graduate Student Awards

Tai-Yun (Terry) Huang – Excellence in Research and Service Qiang (Shawn) Xiong – Excellence in Research Nathaniel Smith – Excellence in Service Elliott Rowland – Excellence in Teaching

### Scholarships

Students receiving Physics Alumni Scholarships: Aaron Flood, Jonathon Mayfield, Tyler Shallenburger, David Heins, Tyler J. Smith, Andrew P. Martin, and Benjamin W. Stephan.

Students receiving Departmental Scholarships: Michael Graham and Talon Thompson

### **Endowed Scholarships**

Charini I. Wanigarachchi, Jordan R. Patzwald, Austin W. White, Tristan W. Gramling, Isaac S. Koch, Nikolaus A. Franklin, Christopher A. McDowell have been offered the T. Bruce & Yoshiko Iwabe Daniel Scholarship

Ross T. Lawrence, Ryan L Wynne, Jordan Wilson, and Michael A. Giffin accepted the T. Bruce & Yoshiko Iwabe Daniel scholarship

Michael Graham accepted the Wallace Souder scholarship

Cody L. Parden accepted the James Thomas scholarship

Talon Thompson accepted the Larry Long Memorial scholarship

Christine E. Groves accepted the Jessica Clements scholarship for Women in Physics

### 2010-11 Graduates

Congratulations to Shea Smith and Tushar Deshpande. Good luck in your next steps in your career!

## In Memory

Max Struble, BA,'41, Pittsburg, Kan.

The PSU Physics Department is honored to have received gifts given in memory of Mr. Struble. We extend our sympathy to his family.

## Our Faithful Supporters

The Physics Department and the student scholarship recipients thank alumni and friends who faithfully support the department and its students year after year. We especially thank the following donors who made gifts to a scholarship or in support of other departmental needs between July 1, 2010 and July 1, 2011.

Dr. and Mrs. Bob Backes Dr. and Mrs. Charles Blatchley Dr. and Mrs. Evan Capron Dr. and Mrs. Michael Cobb Dr. and Mrs. Jim E. Thomas, Jr. Dr. and Mrs. Dennis W. Hewett Dr. and Mrs. Michael D. Shaw Dr. and Mrs. Dale E. Starchman Dr. and Mrs. David Kuehn Dr. Herbert C. Schade Mr. and Mrs. James W. Dearlove Mr. and Mrs. James S. Wood Mr. and Mrs. Randall Bishir Mr. and Mrs. George Cline Mr. and Mrs. Michael Davenport Mr. and Mrs. Paul Dixon Mr. and Mrs. William Forrest Mr. and Mrs. David K. Hays Mr. and Mrs. Douglas L. Hollis Mr. and Mrs. Htet Aung Khant Mr. and Mrs. Kenny Kunstel Mr. and Mrs. Michael Peternell Mr. and Mrs. Frank S. Pistotnik Mr. and Mrs. Charles Poznich Mr. and Mrs. Marion E. Sloan Mr. and Mrs.George E. Lemaster Mr. Roy G. Saffold Mr. Richard Pearson Mr. John Flater Mr. Ronald F. Kendall Mr. Rick Schwerdtfeger Mr. Darrel A. Thomas Mr. H. David Umphenour

Huffman Farms

Boeing Company- matching company for employees who make contributions

ALL ALUMNI: PLEASE KEEP US INFORMED We welcome news of our alumni and friends at any time. Please use this form to report changes of address, changes of employment, or any other news you'd like to share.	Pittsburg State University Physics Department 1701 S. Broadway Pittsburg, KS 66762-7556	Non-Profit Org. U.S. Postage PAID Permit No. 506 Pittsburg, KS 66762
name		
maiden name		
degreeyr. grad from PSU		
address		
city		
state zip		
phone()		
e-mail		
NEWS:		
	PSU Department o	f Physics Contribution
	nameyear grad:	
	address	
I	citystate	_ zip phone
	I would like to make a contribution or pledge to the PSU Department of Physics in the amount of: \$\$1,000 \$\$500 \$\$250 \$\$100 \$\$50 \$\$00 \$\$00 \$\$100 \$\$50 \$\$00 \$\$0	
·	Enclosed is my check for \$	
	Please direct my gift toward:	Please make checks payable to the PSU Foundation.
	Department of Physics Scholars	hips\$
	Department of Physics Unrestricted Fund\$	
	Other	\$
PLEASE MAIL TO:	The PSU Department of Physics is included in my estate plans:  yes no Please send information about including the Physics Department in my estate plans: yes no	
Pittsburg State University 1701 S. Broadway Pittsburg, KS 66762 UPDATE ONLINE AT:	For information on establishing scholarship or making a planned gift to benefit the physics department, contact: Ellen Carter, University Development, Pittsburg State University, 1701 S. Broadway,	
www.pittstatealumni.com or e-mail to alumni@pittstate.edu	Thisburg, NS 00702 020-233-4930 or ecarter@pinisiate.eau Thank you for your continued support!	