Tiny neutron detectors boost homeland security

When Douglas McGregor accepted the position as associate professor of mechanical and nuclear engineering at K-State, he had more to move than just his personal belongings. He brought along the entire Semiconductor Materials and Radiological Technologies Laboratory (SMART lab) from its previous location at the University of Michigan.

The SMART lab has now been reassembled within the mechanical and nuclear engineering department in Ward Hall in a convenient location near the TRIGA Mark II nuclear reactor. This is where McGregor will continue his nine-year project of producing semiconductor neutron detectors—devices that can be used for a variety of neutron measurement applications, including detection of unauthorized nuclear weapons and materials.

"Very few universities have operating nuclear reactors, but Kansas State has one in good standing," McGregor said. "And I need a nuclear reactor to conduct my research."

Nuclear reactors for research, such as K-State's TRIGA Mark II, are typically used as a source for neutrons. Since over 80% of McGregor's research focuses on novel neutron detectors, it was necessary for him to have a reliable source for neutrons.

The essence of the small, portable detectors is a small wafer developed by McGregor and Ray Klaas at Argonne National Laboratory. The wafer, which is about the size of a coin, contains a diode made of semiconductor material similar to silicon. The device is coated to make the wafer neutron sensitive and thus able to detect neutron-induced events.

"The increased interest in this research has a lot to do with the fear of weapons of mass destruction being moved into this country," McGregor said.

Some nuclear weapons contain neutron radiation, and these detectors add to our ability to locate such devices, thereby increasing homeland security.

Because of their small size, low power needs, and low cost to produce, the detectors can be deployed in places where people might not expect them to be. They are so small that security personnel can clip them onto their lapel or belt, or they can be hidden or concealed to covertly monitor people and cargo in transit.

"The bottom line is, they fill the bill for this type of use better than anything else currently out there," he said.

Several patents on the detectors are pending. Two patents have been awarded, and companies are now in negotiations for licensing agreements to manufacture and deploy the devices.

"The detectors can be batch-produced at a low cost of only a few dollars apiece for some models," McGregor said.

continued on page 3
Message from the Dean

Education is the passport to the future, for tomorrow belongs to those who prepare for it today—Malcolm X

At the heart of these words is the message that education cannot be separated from preparation, resulting in "ownership" of the future. How then should we prepare our students for success without planning and laying out the groundwork for that success?

Under the direction and inspiration of the advisory council and college leadership, we have identified four key priorities of pursuit for the College of Engineering:

- Finding new sources of revenue
- Increasing diversity
- Increasing visibility and recognition
- Increasing faculty salaries

In the pages of this issue of Impact, you'll find evidence of our progress in these endeavors. In support of the first item, you'll notice the launch of a new development office. Further components of this priority will be strengthening our connections in Washington, D.C., in order to capitalize on targeted investment opportunities to increase our research agenda.

Women students make up 15 percent of our current enrollment. This should be a much higher percentage, judging from the numbers at our peer institutions. Fifteen percent of Kansas high school graduates are minorities—our enrollment in that category is 6 percent. We are determined to do better in these areas. The Spanish Heritage of the West chair and our industry partners' support of our MEP program, on page 3, are two strong examples of our commitment to increasing diversity.

Publication and distribution of Impact, to more than 22,000 addresses, is a major thrust toward increasing our research agenda. Each issue, and this one is no exception, its pages are filled with the successes of our students, faculty, and alumni. But we are also making a formal plan to help the accomplished group to help us in other ways. We're asking that they be willing to go out and speak at high schools and industries, to civic groups and state agencies, and support our claim that a K-State engineering education can make a difference, that our college has much to offer any of or all these groups.

We want our students to be educated by the top professors in the country—individuals like Douglas McGregor, who is featured in the inside cover. Providing competitive salaries is imperative if we're to attract and retain outstanding faculty members, who not only contribute so much to the educational capital of our nation but to the overall benefit of our students.

Your priority, as my priority, is the success of one依次 linked to the success of the others. In pursuing each, we can succeed, and be ready to show our passport.
Spainhour Chair a ‘gift’ from the family

“This is a gift from all of us—Paul, Marilyn, and I are doing this as a family.”

These were the words of Howard Spainhour, Lenexa, in describing the motivation behind establishment of the Spainhour Family Chair for Women in Engineering and Science.

“All of our family went to Kansas State, and all four of us came out with a good education in our chosen fields, which we appreciated,” Spainhour said. “This is an opportunity for us to recognize the benefits of our K-State education.”

The purpose of the chair, established with a gift of $500,000, is to cultivate the science and engineering interests of women from middle school through graduate levels. The gift is also to perpetuate the memory of Megan E. Taylor, daughter of Marilyn and Bill Taylor and granddaughter of Howard, who died in a bicycle accident in Germany while participating in a high school exchange program, and also the memory of Irma Ylvisaker Spainhour, Howard’s late wife. The recipient will hold the title of Director of the Women in Engineering and Science Program (WESP) in the Colleges of Engineering and Arts and Sciences at Kansas State University.

The combined benefit to both colleges makes the gift a good fit for the Spainhours. Howard graduated with a degree in electrical engineering in 1955, and Irma that same year with a degree in arts and sciences. Their daughter, Marilyn, graduated in 1966 with a degree in modern languages and their son, Paul, graduated in 1969 in electrical engineering.

“For the Colleges of Engineering and Arts and Sciences, this presents an historical moment of great importance,” said Suzanne Franka, founding director of WESP at K-State. “It is our chance to be a true leader in gender equity in U.S. engineering and science education.”

Mr. Spainhour’s generosity has given us the gift of prestige, institutionalization, and resources.”

Franka said the endowed position will make others “sit up and take notice that something good is going on at K-State because someone put up significant dollars to support it.”

She also believes it helps us institutionalize the program and create stability. “In these times of economic stress and budget constraints that universities across the nation are now experiencing, programs like WESP can be a real risk,” she said. “But with an endowed director’s chair, the program’s survival and continuation are ensured.”

“WESP seeks to serve young girls and women who are interested in science and engineering. Institutionalization of the program and the increase in resources and prestige mean that WESP can keep delivering the programs it has that are working well, as well as create and implement new ones.”

—by Mary Rankin

Boost to homeland security

continued from page 1

Nearly 70 percent of McGregor’s funding on the project has come from the U.S. Department of Energy and 30 percent from the Department of Defense.

“With the new SMART lab,” he said, “I am confident I can continue to progress in my research here at K-State.”

The SMART Laboratory is dedicated to fabricating various types of radiation detectors. Central to its make-up is a class 1000 clean room used for patterning the radiation detector designs. The clean room houses photolithography equipment such as mask aligners and bake ovens, whereas the remainder of the SMART lab houses high-temperature tube furnaces, evaporative coating machines, and a variety of polishing and etching equipment. Additionally, it is equipped with radiation sources and electronic nuclear instrumentation to test and characterize the radiation detectors built in the processing area.

McGregor’s educational background includes both a bachelor’s and master’s degree in electrical engineering from Texas A&M University, and both an M.S. and Ph.D. in nuclear engineering from the University of Michigan.

When not working with both graduate and undergraduate students on his research projects, McGregor also teaches two courses in the college related to neutron detection: Principles of Radiation Detection (NE 512) and Nuclear Reactor Laboratory (NE 648).

—by Mary Rankin with contributions from K-State Media Services

Industry partners support MEP

Sara Barstleos, MEE ’00, system engineer with Black & Watch, meets with students at a reception in the Engineering Complex Attilio hosted by the Multicultural Engineering Program (MEP) prior to the Feb. 6 Engineering Spring Career Fair. Thirteen companies and agencies provided support for the reception. More than 40 industries, representing all areas of engineering, computer science, and construction science from across the U.S. participated in the event jointly sponsored by MEP, the College of Engineering, and K-State Career and Employment Services.

Grier appointed to Kansas Board of Regents

A K-State engineering graduate has been appointed to the Kansas Board of Regents.

James R. Grier III, CE 1960, was appointed by former Governor Bill Graves in June 2002 to serve on the board of regents for a term of four years and was confirmed by the Kansas Senate in January. Within the board, Grier serves on the Academic Affairs Committee, University Research and Development Enhancement Corporation Board, and the KSU Research Foundation Board.

“I hope that I can help facilitate and improve education and training for the workforce as Kansans seek a more productive economy and a better life,” he said. Grier is the chairman and CEO of Martin K. Eby Construction Co., a general contracting firm he has been employed with since 1960. He is a national board member of the Associated General Contractors of Kansas, a member of the American Society of Civil Engineers. Grier has served as a reserve officer in the U.S. Army Corps of Engineers for eight years.

He received the Alumni Fellow award in 1991 and was inducted into the College of Engineering Hall of Fame in 1993. The Kansas Board of Regents is a 19-member body that governs the six state universities and approves programs and budgets of 19 community colleges, six technical colleges, four technical schools, and a municipal university. The board deals with educational policies, programs, services, providers, and other systems in an effort to improve and maintain the high quality of post-secondary education in Kansas. The board also coordinates programs such as adult education, the qualified admissions curriculum for high school students, financial assistance for education, and many others.

—by Neely Holland

Make plans now to attend the Seaton Society Banquet & Hall of Fame Festivities November 8, 2003 at the K-State Alumni Center

Grier
Left to right, high school student studies circuitry setup in EECE display; young visitor enjoys BioAg water pumping system; CNSM students march in parade, formal attire optional; BioAg skit spoofs "The Dating Game."

2003 Open House Awards
Outstanding Dept.—CNSM
Yellow Brick—ARE
Best Tech Presentation—CHE
Best Open Class Display—CNSM
Best Limited Class Display—IMSE
Best Fresh/Soph. Display—CNSM
Best Curriculum Display—CNSM

Engineering Banquet Awards
Advisor of the Year—Chuck Burris, prof., ARE & CNSM
W. Leroy Cobden Steel Eng. Leadership Scholarship—Julie Quackenbush, sr., IMSE

St. Pat and St. Patricia
St. Pat—Brent Simmons, sr., ARE
St. Patricia—Heather Macdonald, sr., IMSE

Into Performance
Sylvester named Alumni Fellow

Alan L. Sylvester, CE ’75, has been named the College of Engineering Alumni Fellow for 2003, in recognition of his distinguished career. He is a general manager with CITGO Petroleum Corporation, a privately owned petroleum refining and marketing company in Tulsa, Okla.

Sylvester was on campus Feb. 24 and 25 where he took part in meetings with faculty and students, toured facilities and labs, and visited various classes in the college.

"Alan Sylvester is well respected in his field, and we are honored to have a person of his caliber be recognized as our Alumni Fellow," said Terry King, dean of the College of Engineering.

After earning his bachelor's degree from K-State, Sylvester went on to complete a master's degree in engineering management from the University of Tulsa. He is a registered professional engineer.

He has supported the recruitment and hiring of K-State engineering graduates throughout his career, which has included a variety of engineering and management positions with CITGO and other petroleum industry firms.

NSF graduate fellowship for Thornton

With plans to continue her education at the graduate level, Julie Thornton, senior in computer science and mathematics, will have that pursuit greatly aided with the recent awarding of a nearly $40,000 National Science Foundation Graduate Research Fellowship.

Thornton, who was named a Goldwater scholar in 2002, is currently a research assistant in the computer science and information sciences department in the College of Engineering. She plans to pursue a master's degree in mathematics at K-State, and then continue her studies toward a Ph.D.

According to the National Science Foundation, the select students who receive the graduate research fellowships are expected "to contribute significantly to research, teaching, and industrial applications in science, mathematics and engineering."

Impact readers respond

Many thanks to those who contacted us with identity information on the photo below, featured in the fall 2002 issue of Impact. Eight persons responded to “A look back,” with the first contact being an email from Thom Norbury (EE ’54) of Kansas, who wrote to say the “second person from the right” was his former roommate Arthur Chitty.

Seeing the picture prompted him to try and locate Chitty, which he was able to do through the Internet and email. Chitty (EE ’63), Austin, Texas, emailed us a few days later to identify everyone in the photo as follows, left to right:


He said the picture was taken while the group was “planning for the 1963 IEEE Open House," adding, “My thanks to you for causing the recent interest in an old friend.”

Two others actually in the photo also wrote. John Foreman (EE ’63), Isla-morada, Fla., was “extremely surprised to find [his] photograph on page 7 of Impact. He was able to identify "Art Chitty" and "Don Enaka," saying also, "The others I remember vividly, but after 40 years the names are gone." Larry Loomis (EE ’64), Nantucket, Mass., wrote to provide all six names and said, "I do not know where these men are now," but that “Bob Tichenor passed away several years ago.”

Vince Swart (AgE ’64) emailed to identify Larry Loomis, “a clarinet in several classes,” and Ernest Griffin (MEC ’64) recognized both Larry Loomis and Bob Tichenor. Don A. Still was kind enough to photo-copy and send a page from the 1963 Royal Purple that had the same picture (but no names in the caption), and then identify five of the six men by picking them out (with lettered red arrows) from a group photo (also on that page) of members of the American Institute of Industrial Engineers.

And then there was the email from Mike Dresher, Canton, Kan., who said it was “a real wild guess,” but he thought two of the men looked a lot like people he had gone to school with from 1988 to 1992 at K-State—a Craig Murphy and a Bart Heins—and just maybe those in the photo were the fathers of his two friends. He thought it might be worth a call to find out... Appreciated the suggestion, Mike, but our mystery had been solved.

-The editor
Deaths

George Gray Beidendorf died April 8, 2003, at the University of Kansas Medical Center. He attended Kansas State University, was an Air Force veteran of WWII, and retired as a Lt. Col. of the Kansas National Guard. He had a long and distinguished career in banking, retiring as president of Security National Bank in Kansas City, Kan.

A generous supporter of and lifelong friend to the College of Engineering, his donations to the institution totalled more than $4.4 million. Beidendorf was a founding member of the Seaton Society. He was preceded in death by his wife, Maxine, and is survived by his son, George Jr., and two grandchildren.

1938

Keith C. Walton (EE) died Nov. 12, 2002, in Peck, Kan. He was a retired electrical engineer from Boeing Wichita. Walton is survived by his wife, Celis, a son, two daughters, five grandchildren, and two great-grandchildren.

1962

Wilbert "Bill" Leowen (ME) died Aug. 24, 2002, in Malvern, Pa. He worked for General Electric Facilities for almost 60 years. Leowen is survived by his wife, Dodie, a son, a daughter, and three grandchildren.

1949

William R. Kimel (ME) died December 5, 2002. He was a dean emeritus and professor emeritus of nuclear engineering at the University of Missouri-Columbia. Kimel had also been a professor and head of the nuclear engineering department at Kansas State University.

Robert Joseph Lehnen (EE) died Nov. 16, 2002, in Gainesville, Fla. Lehnen was retired from General Electric Co. He is survived by his wife, Shirley, two children, and two grandchildren.

1951

Walter Wilson Sonderegard (EE) died October 12, 2002, in Wichita, Kan. He worked as an engineer at Beech Aircraft Corporation in Wichita for 20 years and for Martin Marietta Corporation in Denver, Colo., for 15 years. Sonderegard is survived by his wife, Jean, two sons, one daughter, and two grandchildren.

Mall Phone E-mail

Want your classmates to contact you? Check the appropriate box below and we will include your address with your news. You must indicate that you want this information printed.

Please select and list only one type of contact information for publication.

College of Engineering spring retirees

Charles R. Blessey, professor, retired after 33 years with the architectural engineering and construction science department.

Bo Sup Chung, professor, retired after 36 years in the biological and agricultural engineering department.

N. Dean Eckhoff, professor, retired after 34 years with the mechanical and nuclear engineering department.

Charles K. Spillman, professor, retired after 34 years in the biological and agricultural engineering department.
Kayla Grant and Kyle Stump of Kansas State University's Aggie Ski Team are featured in this issue of Engineering Magazine. The Ski Team is known for their dedication and excellence in the sport of skiing. This issue also includes a special section on the College of Engineering's research and development initiatives. The College's focus is on advancing technology and fostering innovation. The annual Callers set new record for TeFUND, highlighting the importance of community support in the college's mission. The magazine also highlights the impact of the college's programs and initiatives on the local community and beyond.