Remembering Dr. Maryly Van Leer Peck

The College of Engineering mourns the loss of its first woman to earn a graduate degree, Dr. Maryly Van Leer Peck, who passed away on Nov. 3 in West Palm Beach. She was 81 years old. Peck is remembered as a pioneer, setting many famous firsts for women in engineering and higher education.

Graduating in 1955 with a master's degree in Chemical Engineering, Dr. Peck came back to UF to earn her Ph.D. in 1963 and was later honored as a Distinguished Alumnae of the University of Florida in 1991. Peck was the first woman to preside over the Society of Women Engineers. At the time of her death, Peck served on the Chemical Engineering Advisory Board at UF.

"Dr. Peck was a trailblazer in so many ways," said Dean Cammy Abernathy. "She was a role model for women of all ages and helped them understand that engineering and leadership were acceptable careers for women."

Before earning her graduate degrees from UF, Peck earned a bachelor's degree in Chemical Engineering from Vanderbilt in 1951. She balanced the role of student and mother, as she was pregnant with her first child while earning her master's degree at UF and her fourth child while earning her Ph.D. In a history book by professor Seymour Block, Peck was quoted as saying:

Being a 'woman of firsts' meant I had many unique experiences. I learned to organize. I set limits, and I always met deadlines. When you have four children and you're trying to balance working and graduate school, you have to insist on things happening in an appropriate way.

Between and after earning degrees, Peck had an active career in engineering, education and higher education administration. She began her career as a research engineer in the aerospace industry, first with the Naval Research Laboratory and later with Rocketdyne Corp. in California. In 1961, while working for Rocketdyne, Peck was featured in a Life magazine issue about the 100 most important young men and women in the U.S. The article led to a series public speaking engagements to professional women about engineering. Peck was also involved in academia early in her career, teaching courses at several southern universities, including Georgia State and Campbell University in North Carolina.

Peck lived in Guam for 11 years, where she became the Chair of the Division of Math and Physical Sciences at the University of Guam. She was later named the Dean of the College of Business and Applied Technology, and then the founder and Dean for what is not the Community College of Guam. Upon her return to the United States, she became the President of Cochise College in Arizona, and also worked as the Dean of Undergraduate Studies at the University of Maryland.

In 1982, Peck returned to Florida. She became the first female president of a Florida public institution of higher education at Polk Community College in Winter Haven. She played an active role in expanding the college, and continued to advocate for the institution after her retirement in 1997. As a former competitive swimmer, Peck was passionate about sports and contributed generously to the university's athletics department.

In addition to an impressive career, Peck is also remembered for her community involvement. In addition to membership in the Society of Women Engineers, she was the first woman inducted into the Rotary Club of Winter Haven, and she was an active member of AIChE, the Society of Professional Engineers, and a number of other organizations. In 2007, Peck was named to the Florida Women's Hall of Fame.

The Chemical Engineering PhD Program is Tops at UF

The quality of the Chemical Engineering bachelor's degree program is widely recognized by recruiters and graduate schools as one of the very best in the nation. If undergraduates provide a school's foundation, the Ph.D. program provides the cornerstone of the department's academic success. Since UF produces nearly half of the Ph.D.'s in the state, we've taken a hard look at the quality of our Ph.D. programs. The UF Graduate School performed a quantitative assessment of all UF Ph.D. degree programs based on nine criteria related to admissions selectivity, retention, student diversity and graduation rates. We were very pleased to see that the Chemical Engineering Ph.D. program placed in the top quartile among all UF programs in seven of the nine indicators. Chemical Engineering's overall assessment score of seven (taken as number of top-quartile placements minus bottom-quartile placements) was the highest at the University of Florida; two full points higher than the next best.

This remarkable score is a measure of the outstanding and diverse PhD students we recruit, the fine mentorship from our faculty, as well as the success of our students in reaching their degree goals. Congratulations Ph.D. Gators!

The following are the nine quantitative criteria:

1. Current number of enrolled students
2. Current percent of minority students
3. Proportion of admitted Ph.D. applicants to applied Ph.D. applicants
4. Proportion of matriculated students to admitted students
5. Median time-to-degree
6. Attrition rate for Ph.D. students
7. Completion rate for PhD students
8. Average yearly Ph.D. degrees awarded

Average number of Ph.D. graduates per budgeted graduate faculty

Dr. & Mrs. Fred Edie Make History by Establishing Endowed Professorship

Dr. Fred Edie (Ph.D., 1970) feels his time at UF had a dramatic effect on his family and career. As a result, Dr. Edie and his wife, Bonnie, have left a legacy of their own by making a gift to the University that will impact generations to come. Addressing one of the Chemical Engineering Department's most critical funding priorities, The Edies have established an endowed faculty position within the department. The Dr. and Mrs. Frederick C. Edie Term Professorship in Chemical Engineering became just the third named faculty endowment in UF Chemical Engineering's long history.

Dr. Edie understands how important a solid educational foundation can be. With a B.S. in chemical engineering, an M.S. in engineering science and a Ph.D. in chemical engineering, he acquired the advanced knowledge that ultimately led to a 25-year career with AMOCO—almost entirely in management positions.

"Looking back, I take the most pride in having been able to maintain a good balance between my career demands and family," Edie said. Married since 1958, Fred and Bonnie first met at his grandfather's farm. They have one child, who lives in Jacksonville. The couple retired to Gainesville in 2002 and love having access to all the wonderful things the University of Florida has to offer, especially Gator athletics.

Edie said that giving back through an endowment gift is one way to acknowledge the impact UF made in his life. In discussing the decision to make a charitable gift to the department, he said, "I feel indebted for the education I received at UF. I believe

it provided me opportunities to demonstrate my skills and, thus, was an important factor in any success that I had at AMOCO. The endowment fund ensures a legacy of quality education for future UF students who pursue an engineering degree."

Named faculty endowments can enhance the department ranking and overall prestige. When we secure an endowed professorship, the gift is invested and the returns are used to provide a consistent and increasing source of funds to the faculty member's academic pursuits. Endowment funds exist in perpetuity and impact generations well beyond our own.

The Edie's set up the endowment with a combination of cash and a planned bequest. "The timing could not have been better, since we were able to take advantage of the law that allows for a tax-free IRA rollover to the UF Foundation," said Edie. The spendable income for the fund will be used to support a term professorship in the Chemical Engineering —a field of study that has played a significant role in his life.

Faculty Highlight: Fan Ren

Dr. Fan Ren joined the University of Florida in 1998. While employed at Bell Labs in the 1990s, Dr. Ren and colleagues were instrumental in enabling the transition of compound semiconductor technology into modern electronic devices (such as cell phones) and data communication systems. At UF, Dr. Ren has blazed a trail of innovative devices based on advanced semi-conductor devices. A recent effort in his group is on developing low-cost, handheld and wireless-capable sensors for health care monitoring. For example, his students are working on a handheld exhaled breath-based glucose monitor, which displays the glucose level in body fluids such as exhaled breath condensate, and also has wireless capability to transmit the test signals to a clinic. The device can be programmed to send the alarm to a doctor's clinic, once the glucose exceeds certain preset levels. Such a device would mean patients with diabetes no longer have to endure the pain and inconvenience of lancing the skin to draw blood for testing, as all current consumer glucose tests require. In addition, the device would enable patients to perform self-testing and monitoring.

Dr. Ren has recently reported the detection of glucose with his technology with the best limit of detection reported to date. Ren and colleagues have filed six patents to cover the sensor detection mechanisms that enable integration and separate optimization of the electronic and sensor functions. In the past few years, his research team has collaborated with scientists at the University of Florida, other institutions, private companies, and practicing physicians in the UF medical school and demonstrated the advantages of using the sensors in a variety of media, including exhaled breath condensates, saliva, urine and blood-based body fluids for sensing prostate cancer antigen, breast cancer markers, kidney injury molecules, traumatic brain injury markers and glucose. Importantly, the response time of his sensors are much shorter (< 5 - 30 sec) than most current technologies. The sensors have also been recently integrated with a wireless data transmission system. A hand-held pH sensor and remote hydrogen detectors are already in use in the field.

Sensing principle: The sensor is based on AlGaN/GaN high electron mobility transistors (HEMTs). The device (Figure 1) consists of a base substrate, on which a 3 micron thick GaN layer is deposited (blue layer in Figure 1). On top of this layer a thin film of AlGaN material of thickness roughly 20 nm (pink layer in Figure 1) is present. Both the GaN and AlGaN are single crystal structures, and the transition from Ga to Al at the interface creates mechanical strain in the crystals which are piezoelectric in nature.

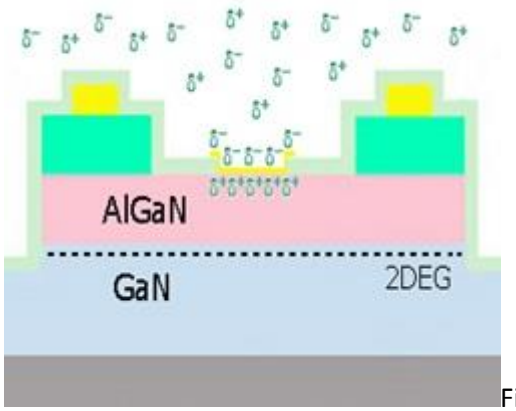

Figure 1. The AlGaN/GaN sensing principle

This causes a two-dimensional electron gas to exist at the interface (dashed line in Figure 1). This high density electron gas induces positive counter charges at the top of the AlGaN/GaN HEMT surface layer in the so-called 'gate region' that is open to the ambient. Any slight changes in the ambient changes in the gate area, leading to changes in the two dimensional electron gas. If such an experiment is performed under an external bias voltage, then changes in surface charge on the gate area will cause changes in the current that flows through the two dimensional electron gas, leading to an amplification of any charge in the gate region. This amplification effect allows the HEMT to be extremely sensitive to changes in the ambient. In the biosensors developed by Dr. Ren and colleagues, the approach is to first adsorb capture molecules (like antibodies or enzymes) that can bind to target molecules in solution; the specific binding between antibody and antigen or enzyme and substrate leads to a sensitive change in current.

The technology allows for a very large number of applications. The biggest advantage for this technology is the fact that AlGaN/GaN technology is very mature. This technology is similar to the analogous AlGaAs/GaAs chips used in every cell phone, is manufactured on a very large scale by companies for green laser diodes and is therefore cheap, robust and reliable. Additionally, due to the wide energy bandgap, the AlGaN/GaN material system is extremely chemically stable. There is no known wet chemical solution that can etch them. Dr. Ren is currently exploring collaborations with several companies in the U.S. and abroad for transferring the technology into the marketplace.