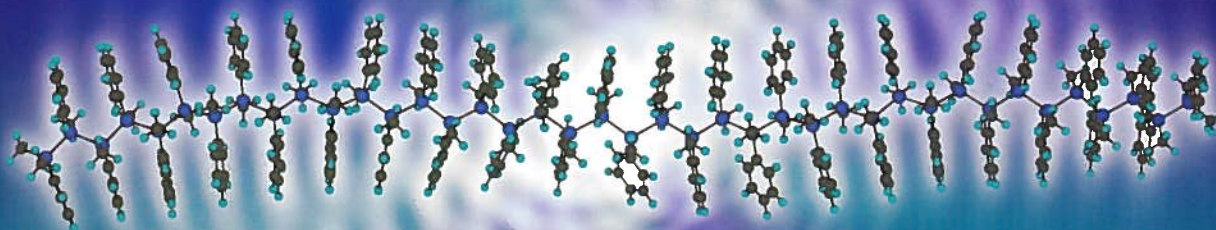


Chemical Engineering

Alumni Newsletter
Volume 17 • Spring 2002



GORDON A. AND MARY CAIN
DEPARTMENT OF CHEMICAL ENGINEERING
LOUISIANA STATE UNIVERSITY

Letter from the Chairman



Dear Alumni and Friends,

The new Chemical Engineering facility remains a high priority for the department. Planning money from the state of Louisiana is already being put to use on the project, and the appointed architectural firm is drawing up the plans. We are considering two building options: either an annex to our existing facility or a new facility near CEBA. The benefit of the former is that it would provide maximum space. The latter, however, has been the primary focus because of its consistency with the campus master plan of a focused engineering complex.

In other news, we are happy to announce that three new faculty members will join us in fall 2002. Ben McCoy comes to us from the University of California, Davis, and will fill the first Gordon A. and Mary Cain Endowed Chair. Ben's background is in applied mathematics. Associate Professor Judy Wornat, who will hold the Robert Hughes Harvey Professorship, comes to us from Princeton University with a specialty in analysis of combustion products. Jerry Spivey, our new associate professor who will hold the James McLaurin Shrivvers Professorship, comes to us from North Carolina State University, where he focused on applied catalysis. These new hires will be highlighted in our fall newsletter. In addition to new faculty, Dan Mowrey, a retiree of ExxonMobil, has also joined us in the Undergraduate Lab as new Undergraduate Lab manager and teaching associate. Mowrey's knowledge of process-control systems has proved greatly useful to our undergraduate students.

The Alumni Advisory Committee will hold its second meeting in early August to continue helping the department define educational objectives and assessment tools to evaluate those objectives. We are also planning to hold a reunion for all our alumni and their families on October 12, from 11 a.m. to 2 p.m. The reunion will take place between Tiger Stadium and the Chemical Engineering Building on South Stadium Drive. We plan to have jambalaya and refreshments. Alumni will have the chance to visit with other chemical engineering graduates and the faculty, while seeing the many important additions to our facilities. We will be mailing invitations, so please let us know if you plan to attend. You can also let us know if you plan to attend by completing the RSVP form on our website (www.che.lsu.edu).

We believe that all our efforts toward improvements and modernizations will ensure that our program, on both undergraduate and graduate levels, meets the needs of local industry and produces graduates of the highest caliber. As always, if you have any questions or comments regarding our program and the direction in which we're headed, please do not hesitate to stop by the department. The faculty and I would be most interested in speaking with you.

Sincerely,

F. Carl Knopf
Robert D. and Adele Anding Professor and
Gordon A. and Mary Cain Department of Chemical Engineering Chair

If you would like to know more about contributing to the department, please contact Carl Knopf at 225/578-1426 or send an e-mail to knopf@che.lsu.edu.

A Word of Thanks to Our 2001-02 Contributors

Although financial support has been impressive, departmental expenses continue to rise, and further renovations are essential in remaining competitive with our counterparts at other universities. We would like to thank the following individuals and corporations for their roles in maintaining the outstanding reputation that LSU has achieved throughout the years.

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On the Cover



A special class of conductive polymers consists of polysilanes, which are silicon-based polymers with remarkable optical and electrical properties as a result of sigma-conjugation in the main chain. Their transparency in the visible range of the spectrum is of special interest for applications in light-emitting devices as well as hybrid photovoltaic cells. Furthermore, the polysilanes optical properties exhibit unique sensitivity for deformations of the polymer backbone caused by external stimuli such as temperature, polarity, pressure, etc., allowing their use as nanoprobe in complex systems, which are difficult to model. Assistant Professor Thomas Cleij graciously supplied these images from his research.

Chemical Engineering is published for the benefit of its alumni and students. Comments and suggestions should be directed to:

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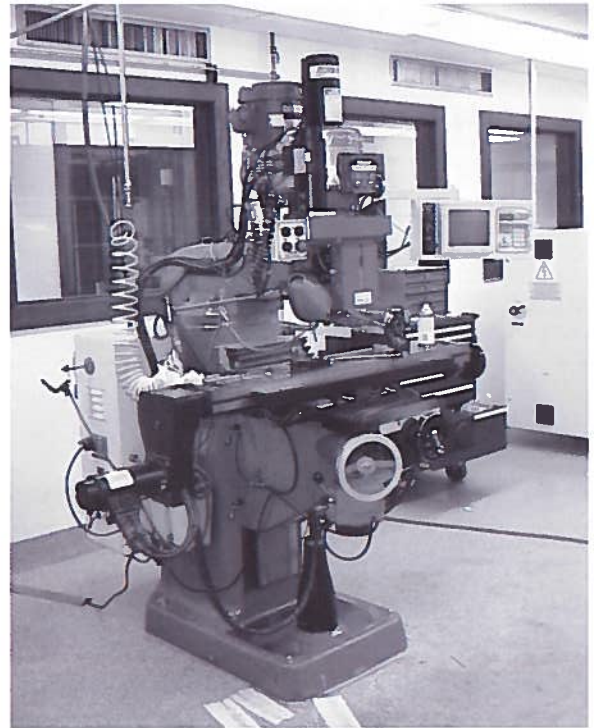
CNC Shop Is Sparkling Addition

The Department of Chemical Engineering is proud to announce the addition of a Computer Numeric Controlled (CNC) Shop to its already excellent machine shop facility. The CNC Shop is free of the grinding particulates generated by many types of tools. Machines in the CNC Shop are sensitive and must be free of such particulates in order to function properly.

According to Chair Carl Knopf and Machine Shop Manager Paul Rodriguez, the Department of Chemical Engineering is fortunate to have such a facility. Most universities do not have CNC Shops, and they are key in the production of high-grade research equipment.

The CNC Shop is housed in the old chemical engineering building and includes a computer-controlled lathe and mill.

Next year, the department will add an Electron Discharge Machine (the second such one in Baton Rouge) to the CNC Shop, and a four-axis computer-controlled milling machine will arrive in June 2002. An adjoining room houses the computers used to program and control the machinery.



A mill was the first piece of machinery to grace the new CNC Shop.



A lathe soon joined the mill.



Martin Vangundy at work in the CNC Shop.

Catching up with Former Professor Cecil Smith



Former Professor Cecil Smith.

After 13 years in academia and 23 years as a private consultant, former Professor Cecil Smith still finds himself very busy—even busier than some of his former graduate students.

Professor Smith notes that his students “went on to successful careers, most in industry but a few in academia. Many of them are now retir-

ing to do woodworking, volunteering, or the like. I am still working! I have obviously done something wrong.”

Smith remembers his years at LSU (1966–79) as “very enjoyable” (with the exception of a few too many faculty meetings). During these years, he played a major part in creating a preeminent program in process control in the Department of Chemical Engineering, an achievement that Smith calls “both fun and professionally rewarding.” Then, he had the honor of acting as the first Chair of the Department of Computer Science from 1974–79. “In starting Computer Science departments, all universities drew on resources in other departments,” says Smith. “I got into computing through process control, being an active participant in the second wave of process computer installations. People my age had to learn it the hard way. I can still proudly say that I have never had a formal course of any kind in computing!”

Smith eventually gave up academia for the private sector in 1979 because his “outside activities just continued to increase.” For a short time, he pursued project work but “this was just not rewarding professionally. I prefer to work with a few companies on a continuing basis, the objective being to get the most out of automation.” Smith’s consulting work also included a LOT of travel. “In the consulting business, there are two realities. First, you have no job security. Second, you live out of a suitcase,” says Smith. “I started traveling with the philosophy that if I did not miss one flight in five, I was getting to the airport too early. My wife still contends that [once] they nearly closed the door on her foot!”

In addition to working as a consultant, Smith develops and teaches process-control courses within the continuing education context of American Institute of Chemical Engineers (AIChE). He has developed two simulators specifically for teaching process control as practiced in industry and currently offers a computer-based training (CBT) product on process control. “During the coming years, I intend to focus my efforts on enhancing my existing CBT product and developing new CBT products, all in process control,” says Smith. “I truly believe that CBT is the future of continuing education. The days of flying half-way across the country to live out of your suitcase for two or three days to listen to a live(?) lecturer have to end. CBT is not perfect, but it is better than this! One obstacle is that CBT is often viewed as taking human interaction out of the learning experience. This is neither correct nor appropriate. Distance learning still involves human interaction, but via chat rooms, e-mail, etc.”

And while Smith, accompanied by his wife, still travels for business, he and his wife also travel for pleasure. “We now drive to most places, including Mexico and Canada. We have been to all 50 states, most of the national parks, etc. We love New Mexico and Arizona (except for Phoenix). Maybe one day I will be able to retire there.”

From Cuba to Louisiana: 1961–1975

Many people know that the Department of Chemical Engineering was, in the past, closely linked to the Audubon Sugar School. The sugar industry helped create “a new kind of professional, the chemical engineer” (see “Honoring Norbert Rilleux” on page 10 in this issue). However, what some may not know is that a large number of Cuban students came to study at the Audubon Sugar School, and later at the Department of Chemical Engineering, particularly during the two decades after Fidel Castro’s political rise in Cuba. We were able to contact some of these students and explore the reasons why they chose LSU, how they felt about their experiences here, and how it felt to leave Cuba behind.

René L. Sagebien (B.S. 1963) chose LSU because he knew a family nearby in New Orleans. “Additionally,” says Sagebien, “a close friend of my father had graduated as a chemical engineer from LSU and spoke very highly of the University.”

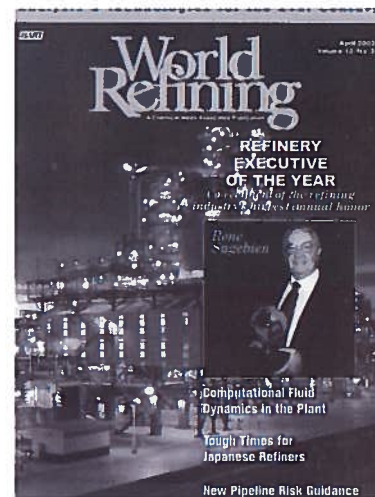
Sagebien found many friends in his new home...Baton Rouge. “Math department Professor Richard Anderson offered to take my sister into his home to help me out financially and also to help my sister learn English,” says Sagebien. “My sister had left Cuba and intended to enroll at LSU. She had no money and no place to go. I did not have any money either (having left Cuba without any money or support from home). I am quite grateful to Dr. Anderson for this wonderful gesture. In addition, Dr. Thom, whom we met through the Andersons, helped my parents find jobs and provided my parents with a place to stay free of charge. There were many other examples of families in the Baton Rouge community that helped the Cuban students and their families in many ways. These are wonderful memories.”

Sagebien was the first Cuban student to re-enroll at LSU after Castro took over. “I had attended LSU for the fall semester of 1958 and was re-admitted in June 1961,” states Sagebien. “Upon my return, I found a number of Cuban students whom I had met before at LSU who had not returned to Cuba like I did. They refused to believe that Castro had turned to communism and went back to Cuba upon graduation from LSU. A number of these students were not able to leave the country after their return for various reasons. Unfortunately, some of them are still in Cuba today.”

After graduating, Sagebien began working for DuPont in Chattanooga, Tennessee, as a research engineer. He has since worked for Ethyl Corporation, Hess Oil Virgin Islands Corporation, Amerada Hess Corporation, and HOVENSA (a joint venture between Amerada Hess and Petroleos de Venezuela). Currently, Sagebien resides in St. Croix, Virgin Islands, and is the president and chief operations officer of HOVENSA. We are proud to report that Sagebien received the Refining Executive of the Year Award from World Refining in April 2002. Interested readers can find an article on this award in the April edition of *World Refining*.

Our own **Professor Armando Corripio (B.S. 1963, M.S. 1967, Ph.D. 1970)** went to work full time for Dow Chemical Company in Plaquemine after receiving his B.S. For five years he took graduate courses in the evening until he received his M.S. Then, he left Dow to work full time on his dissertation research while teaching undergraduate courses as an instructor at LSU.

Corripio cites “the ill-fated Bay of Pigs invasion” as the beginning of his decision to come to LSU. “I was in the second semester of my junior year at the Catholic University of Cuba on April 17, 1961, when [the invasion] took place. On that day, Castro confiscated our university and closed it. I decided to come to the States to continue my education and join my fiancée and future wife Connie in Miami. There, I met my friend and classmate Al Lopez (now vice president at ExxonMobil) who told me he had decided to come to LSU to continue his education. We knew about LSU in Cuba because of its strong sugar engineering program, then part of the chemical engineering department. So I decided to join Lopez and come. LSU was very generous in accepting our credits, and we were able to finish the undergraduate program in three semesters.



Sagebien accepts award.



Professor Armando Corripio in 1971.

Cuba (cont. from page 6)

Corripio says that his fondest memories were of “the professors who were very knowledgeable and created an atmosphere of learning. There were only six professors: Jesse Coates, Bernard Pressburg, Frank Groves, Arthur Keller, James Cordiner, and Dale Von Rosenberg. I took courses from all of them and learned a lot about chemical engineering.”

Corripio did not suffer much homesickness. “Since what I left behind was a concentration camp consisting of the entire island, I was so happy to be free that I did not even notice how much hardship I was going through. I was trying to eat three meals a day at Hatcher Cafeteria for less than \$2 total. I was able to do it, but I lost so much weight the doctors at the health center thought I had tuberculosis. After one semester at the North Stadium dorm—no air conditioning, but only \$72 a semester—I married Connie, and my mother came from Cuba and joined us. This changed the nature of our hardships.”



Professor Corripio in the classroom in 1998.

While most of the Cuban students from his period dispersed to other places, Corripio chose to remain in LSU's Department of Chemical Engineering. As he explains, “the second semester after my B.S., I took an evening course on process control from Professor Paul Murrill, who got his Ph.D. and replaced Von Rosenberg at the time I got my B.S. From that moment on, Paul started working on me to return to school and get a Ph.D. Four years later, when I finally decided to come back, he was head of the department. As I was about to finish my Ph.D. and accept a job with Exxon, Paul came in one morning and asked me if I had accepted a job yet. I told him I had not, and he asked me to wait, but he could not tell me why. What happened was that he was becoming Provost, on his way to Chancellor, and he offered me his position on the faculty. Being a case of the right place at the right time, I had to accept, and here I am. I have never regretted it.”

Continued on page 8

Cuba (cont. from page 7)

Like Corripio, **Carlos A. Smith (M.S. 1970, Ph.D. 1972)** also worked at Dow Chemical Company while attending LSU part time. Smith recalls no homesickness for Cuba, only good memories of LSU: "Great memories all over! Great time, great University, great friends, and my two children were born in Baton Rouge!" Smith became a faculty member at the University of South Florida, going "through the regular assistant professor, associate professor, and professor steps." He is now the Associate Dean for Academics and has written two books, one of them with Corripio.

After **Alfredo Lopez (B.S. 1963, M.S. 1965, Ph.D. 1968)** left Cuba for Miami, Florida, he chose LSU as the place to finish his chemical engineering education. "I remember going to the city library to research the various university programs and costs," says Lopez. "I selected LSU because of the quality of their chemical engineering program and the very reasonable cost." Lopez has many fond memories of LSU, including his "life in the stadium dormitory; the tough courses by Dr. Pressburgh and Dr. Coates; my evenings in the Field House reading or studying; the extensive work required for the Process Design Project, which required several nights without sleep to complete; and the many friends that I made during those years." Lopez does not report feelings of homesickness. "I was starting a new adventure in a new country," states Lopez. "My home town in the U.S. became Baton Rouge, Louisiana."

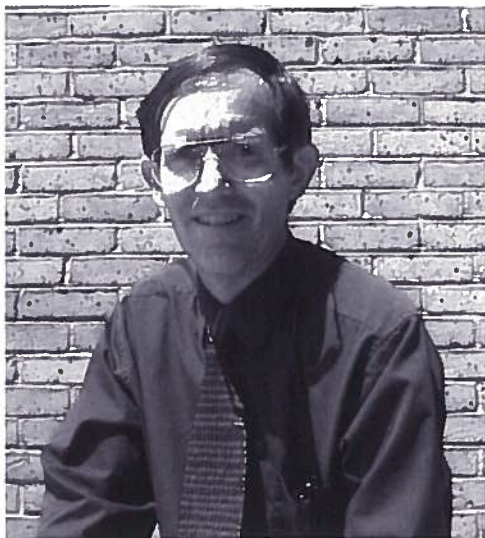
After graduating, Lopez joined Exxon Research and Engineering Company in Florham Park, New Jersey. He began as a project engineer in developing and applying advanced process-control and optimization methods to refinery units. He is currently vice President of Research and Development at the ExxonMobil Research and Engineering Company and was inducted into LSU's Engineering Hall of Distinction in 2001. "I remember fondly a time when the President (Clarence Eidt) and two vice presidents ([myself] and Don Daigle) out of four senior executives were LSU graduates!" says Lopez.

Like Lopez, **Ivan Navarro (B.S. 1969)** was drawn to LSU largely because of its quality chemical engineering program, but also because of friendship ties. "The school had a good reputation among the Miami Cuban community. Also I had a close friend who had a brother at LSU getting his Ph.D.," Navarro says. "He was also a part time teacher." Navarro speaks of good memories, but remembers the loneliness he felt for his family who was still in Cuba. After graduating, Navarro began working for Universal Oil Products (UOP) and has worked there since. He is a regional technical manager in Europe.

The Department of Chemical Engineering would like to recognize the Cuban students who received their degrees from LSU. Those who received their degrees between 1961 and 1975 are listed here. These students are invited to send us their e-mail addresses and other information changes for inclusion in our alumni database:

Ricardo Abascal (B.S. 1970); Israel Cabrera (B.S. 1967); Ricardo Callejas (B.S. 1961, M.S. 1963); Robert Camacho (B.S. 1972)*; Leonardo Caraballo (B.S. 1970); Raul Cardenas (B.S. 1967)*; Orlando Cardoso (B.S. 1966); Joseph Curbelo (B.S. 1971); Eduardo Gonzales Del Valle (B.S. 1965, M.S. 1969, Ph.D. 1975); Ignacio Gonzales Del Valle (B.S. 1965, M.S. 1970); Gilberto Escobar (B.S. 1969, M.S. 1971); Alberto Espino (B.S. 1968, M.S. 1970); Enrique Espino (B.S. 1965); Ramon Espino (B.S. 1964); Segundo Fernandez (B.S. 1971); Jorge Ferrer (B.S. 1967); Carlos Finalet (B.S. 1967); Louis Gonzalez (B.S. 1967, M.S. 1969)*; Rafael Juantorena (B.S. 1975, M.S. 1977); Jose Lima (B.S. 1961, M.S. 1966); Ricardo Lima (B.S. 1970); Alfredo Lopez (B.S. 1963, M.S. 1965, Ph.D. 1968); Enrique Lopez-Aguilar (B.S. 1968, M.S. 1970); Mamerto Luzarraga (B.S. 1971); Jorge Martinez (B.S. 1977); Eduardo Martinez Lima (B.S. 1967); John Medina (B.S. 1966); Carlos Moreno (B.S. 1972)*; Ivan Navarro (B.S. 1969)*; Ivan Peraza (B.S. 1970); Oscar Peraza (B.S. 1968); Martin Pinilla (B.S. 1967, M.S. 1975); Maria Rodriguez (B.S. 1963)*; Alberto Rovira (B.S. 1964, M.S. 1966, Ph.D. 1981); Francisco Rovira (B.S. 1963)*; Rene Sagebien (B.S. 1963); Rodriguez Salazar (B.S. 1973); Nora Sanchez (B.S. 1965)*; Juan Santa-Coloma (B.S. 1964)*; Carlos Smith (B.S. 1970, M.S. 1972); Felipe Suarez (B.S. 1970); Jose Villa (B.S. 1964)*; Nemesio Viso (B.S. 1964, M.S. 1971).

*We have no contact information for these alumni. Any help in locating them would be greatly appreciated. Please send information to gradcoor@che.lsu.edu.

Professor Greg Griffin: Microelectronics and Model Trains

Professor Greg Griffin has been a member of LSU's Department of Chemical Engineering for 15 years. A native of southern California, he obtained his undergraduate degree in chemical engineering at California Institute of Technology. He received his Ph.D. from Princeton University, where under the supervision of Ronald Andres, Griffin performed dissertation research on a molecular beam technique for producing nanometer-sized metal clusters. He then accepted a one-year National Research Council postdoctoral fellowship at the National Bureau of Standards (now NIST) working with John Yates on applying surface spectroscopies for studying dynamic heterogeneous catalyst systems.

Griffin began his teaching career at the University of Minnesota, performing research in surface science and heterogeneous catalysis. He came to LSU in 1987 at the invitation of Edward McLaughlin to help the department develop a research thrust in the area of materials science. In 1998, he was appointed the George H. Nusloch II Endowed Professor of Chemical Engineering.

Griffin's research since coming to LSU has focused on synthesizing and processing advanced ceramic and electronic materials. Two early sponsored projects included developing a novel aerosol synthesis technique for making aluminum nitride powders (which were of interest for making electronic substrates with high-heat dissipation) and chemical vapor deposition (CVD) of titanium-dioxide thin films (which were being considered for gate-oxide and capacitor applications in microelectronic devices). In recent years, his major interest has been the CVD of copper thin films. Copper has become the material of choice for on-chip interconnect wiring in the current generation of microprocessors. As the feature sizes in these devices continues to become smaller, CVD methods are likely to become necessary to reduce mass transport limitations and maintain uniform deposition rates over highly structured surface topographies. Griffin not only expects to continue his research in the area of microelectronic device fabrication processes, but he is also considering collaborative efforts with other faculty in the department to identify further applications where CVD metal deposition techniques might be useful (e.g. to prepare structured catalysts, membranes, and microreactors).

Griffin's classroom teaching is identified mainly with the sophomore-level course "Mathematical Modeling of Chemical Engineering Systems." The course follows the three required semesters of calculus and differential equations and the department's mass and energy balances course. The course introduces the computer-assisted numerical methods needed to go beyond the analytical methods presented in earlier mathematics courses and demonstrates these methods in the context of chemical engineering problems that reinforce and extend the material covered in the previous material balance course. "I judge the success of the course by the number of former students that come back to my office with questions about how to apply one of the methods covered to something they are doing in a later chemical engineering course, or sometimes even on their first job assignment!" says Griffin.

Griffin has also taught the recent summer offerings of "Chemical Reaction Engineering." These summer classes represent part of the department's effort to increase scheduling flexibility for students who are working in the co-op program. In alternate years, he teaches an elective course in electronic materials processing, which gives chemical engineering students an introduction to a manufacturing technology that allows millions of transistors to be placed onto a piece of silicon the size of a postage stamp.

In 1998, Griffin assumed responsibility as the department's undergraduate coordinator, an assignment which includes the task of preparing for the department's upcoming Accreditation Board for Engineering and Technology accreditation visit in 2003. The changes that have been implemented during this period includes holding regular meetings with students and their assigned faculty advisers each semester. Also, students with an academic deficiency are identified and counseled using an academic probation system. A set of educational objectives and program outcomes have been defined for the department, and a procedure for documenting and upgrading course content with respect to these objectives is being established. An Alumni Advisory Committee has been established to obtain external input into this process, along with a department alumni website to record additional comments from graduates. A Student Advisory Committee is also being assembled to obtain "real-time" feedback about the curriculum.

Professor Greg Griffin, (cont. from page 9)

Griffin is married with two children. His wife Nancy, also a native of Southern California, is a fourth-grade teacher at Episcopal School in Baton Rouge. The Griffins are both members of the Baton Rouge Symphony Chorus and the senior choir at St. James Episcopal Church in downtown Baton Rouge. Their son, Patrick, is a sophomore at MIT majoring in computer and electrical engineering. Their daughter, Julia, is a junior at Episcopal High School with interests in mathematics, marine biology, art, and ballet. Greg is a member of Club South Runners and regularly participates in 5K to half-marathon races. On weekends, he maintains an N-gauge model railroad that occupies three walls of the family garage.

Dan Mowrey: New Undergraduate Lab Manager and Teaching Associate



Dan Mowrey recently joined the chemical engineering department as the Undergraduate Lab manager and teaching associate. Mowrey received his B.S. from Georgia Tech University in 1965 and his M.S. from the University of Illinois in 1967. He worked for DuPont as a co-op while in undergraduate school and for two years after graduating. He then moved to Humble/Exxon/ExxonMobil and worked on their process-control computer systems until he retired in 2001. Mowrey reports that he still enjoys programming “when I have the time,” although now “it’s mostly on PCs.”

Mowrey began helping to maintain the process-control systems in the Unit Ops Lab as a part-time volunteer. Then he “got roped into training to be an instructor in unit operations laboratory” too. So far, it’s kept me pretty busy, but I’m beginning to get the hang of it and look forward to helping some young folks become better engineers.”

Mowrey and his wife, Mary, enjoy taking long walks together and look forward to taking long trips together when she retires. For the last 15 years, bowling has been his main athletic—“if you can call it that”—endeavor.

Honoring Norbert Rilleux, Pioneer in Chemical Engineering



On April 18, 2002, Dillard University in New Orleans honored Norbert Rillieux and his work with a National Historic Chemical Landmark status ceremony. Norbert Rillieux (1806–1894), was an African American chemical engineer who developed the triple-evaporator process for sugar refining in 1843. His vacuum-evaporation technology is the basis for almost all modern industrial evaporation processes. To learn more about Rillieux and his fascinating life, see “Norbert Rillieux: Chemical Engineer and Free Black Cousin of Edgar Degas,” in the summer 1998 edition of *Chemical Heritage*, the newsmagazine of the Chemical Heritage Foundation.

Shell Oil Awards Grants

The Shell Oil Company Foundation has awarded \$20,000 to the Department of Chemical Engineering. The department has used the grant to assist in the on-going progress of upgrading the undergraduate laboratory facilities and in purchasing additional equipment and materials to improve the performance of laboratory experiments. The funds were also used to purchase auxiliary equipment to complement the efforts of the department to network all of the experiments onto a single-computer-control system.

Faculty News

Professors **Armando Corripio** and **Danny Reible** finished third overall for the third consecutive year this March in the Leukemia Cup, a sailing regatta designed to raise funds for leukemia research and victims. **Professor Louis Thibodeaux** sailed with them in two of the three races and guided them to a second-place finish in one of them. Their boat raised more than \$600 for the Leukemia Society.

Professor Armando Corripio's book *Principles and Practice of Automatic Process Control* is in its second edition and has sold 12,000 copies to date. Its publisher has requested that Corripio and his co-author, Carlos Smith, produce a third edition of the book.

Professor Kerry Dooley chaired the session on "Materials Processing in Supercritical Fluids" at the American Institute of Chemical Engineers (AIChE) 2001 Annual Meeting.

Professor Douglas Harrison gave a seminar titled "Hydrogen Production Using Sorption-Enhanced Reaction" at the Illinois Institute of Technology, in Chicago in April. He is also serving as a peer reviewer for the Department of Energy's University Coal Research program.

Martin Hjortsø left for Denmark in June. He will spend a year at the Center for Process Biotechnology at Denmark Technical University (DTU) as the Otto Mønsted Visiting Professor. "DTU is my alma mater, but the Center for Process Biotechnology did not even exist when I was a student there," says Hjortsø. "Since then, biotechnology has exploded, and it is very big at DTU because the biotech industry hires a large number of the chemical engineering graduates. I will probably be teaching a high-level class on microbial kinetics while I am there as well as work with some of the graduate students on their projects. It will (hopefully) be good to be home again. I hope to be able to find a place to live downtown in the medieval parts of Copenhagen, inside the old city ramparts, which I find a more charming location than the suburban area north of the city where the university is located."

Assistant Professor Elizabeth Podlaha presented a paper titled "Electrodeposition of Alloys and Nanocomposites" at the sixth Joint Engineering Society Conference (JESC) of the Louisiana Engineering Society in Kenner, Louisiana, in February.

Professor Danny Reible received the 2002 Charles E. Coates Award from the American Chemical Society and American Institute of Chemical Engineers. Reible has also been invited to participate in the Pellston Workshop on Sediment Quality Criteria for the Society of Environmental Toxicology and Chemistry. This workshop is designed to provide scientific evaluation and input on environmental regulatory policies.

Professor Louis Thibodeaux rode in the 2002 Spanish Town Mardi Gras Parade, courtesy of the Faculty Athletic Club. He was accompanied by his granddaughter, Bonnie McLindon.



Professor K.T. Valsaraj chaired a session on "Prediction and Correlation of Transport Properties" at the AIChE 2002 spring meeting in New Orleans. He was also a major contributor, along with **Professor Danny Reible**, in the Louisiana State Department of Natural Resource's rewrite of the 29B rules for disposal of oil-field waste. Valsaraj continues his work on the capture and analysis of fog water in and around metropolitan Baton Rouge as part of a larger National Science Foundation project.

Faculty Awards

Kerry Dooley has been awarded two new grants: NSF-REU, "Research in the Chemical Sciences for Undergraduates at Louisiana State University," with Steven F. Watkins, 2002–04 (\$283,000); and Eagleview Technologies/MGK Co., "Catalyst Development and Reactor Study for Asymmetric Ketone and Polyimide Production," 2002 (\$70,000).

Douglas Harrison received the 2002 Dow Chemical Company Outstanding Teaching Award.

Elizabeth Podlaha has received a NSF SGER grant (\$80,000) to explore the use of electrodeposition to produce nanostamps for optical gratings (with Robert Cohn, University of Louisville). Podlaha was also listed in the 2002 edition of *Who's Who in Engineering Education* (WWEE).

Danny Reible received funding in the amount of \$2.25 million for "Field Demonstration of Active Caps," a project led by LSU and includes Rice, Georgia Tech, and Carnegie Mellon Universities as well as several federal agencies and industrial concerns. The goal of the project is to demonstrate innovative technologies for managing contaminated sediments.

K.T. Valsaraj has received renewal of his grants from the U.S. EPA through the Gulf Coast Hazardous Substance Research Center and also from the U.S. Army Corps of Engineers (Department of Defense).

Spring 2002 Departmental Distinguished Seminar Series

Brian G. Willis

"Chemical-Physical Mechanisms of Aluminum and Copper Metalization Technology"

February 22, 2002

The regular advances in silicon-integrated circuit technology have required continuous research and development of new materials and processing methods. Brian G. Willis's presentation focused on interconnect technology, an area of particular emphasis for the past 10 years. Interconnect refers to the tiny sub-micron metal wires and surrounding dielectric materials that provide the connections for signals, power, and ground to the transistor devices. Aggressive shrinking of interconnect structures has required intensive research and development of metalization and dielectric materials. Additionally, the complexity of interconnect designs has required a greater understanding of the chemistry and physics of the materials processing methods. Aluminum, and more recently copper, have been the metals of choice for interconnect metalization in silicon technology. The recent introduction of copper interconnects has created new issues for materials processing and reliability. In particular, "barrier-layer" materials are needed to provide an adhesion layer for the copper seed film and act as barriers against copper diffusion into the interlayer dielectric materials. Willis argued that if the electrical resistance advantage of copper over aluminum interconnects is to be preserved, it is necessary that these liner materials scale to a minimum thickness without compromising adhesion promotion and barrier effectiveness. To design such materials and processing methods, it is necessary to understand the chemistry and physics of copper diffusion within dielectric materials. Results will show that investigations of the copper transport process provide a chemical-physical basis for development of advanced dielectric and liner materials for copper interconnects. Willis's visit was hosted by Elizabeth Podlaha.

Sachin Velankar

University of Minnesota

"Dynamics of Immiscible Polymer Blends with Compatibilizer"

March 4, 2002

Blending of immiscible polymers is a common means of realizing materials with properties that are difficult to obtain with individual polymers. Examples include rubber-toughened thermoplastics, barrier materials for packaging, and highly reflective mirrors composed of several layers of different polymers. Surface-active block copolymers are often added as compatibilizers during processing of these blends in order to promote mixing and control the morphology and properties of the final material. The effects of such a compatibilizer on the dynamics and the rheological properties of droplet-matrix blends were the primary concern of Sachin Velankar's presentation. Velankar's visit was hosted by K.T. Valsaraj.

Anthony Dixon

Worcester Polytech Institute

“CFD Fluid Flow and Heat Transfer for Fixed Bed Reactor Design”

March 8, 2002

Computational fluid dynamics (CFD) is becoming more realistic for use in the description of the detailed flow-fields within fixed beds of low tube-to-particle diameter ratio. Prevailing models of fluid flow invoke either a constant velocity (plug-flow) profile, or make use of a single axial-velocity component with radial variation across the tube diameter. However, according to Anthony Dixon, difficulties in predicting packed-bed performance and the wide disagreement between correlations for effective heat transfer coefficients suggest that these are oversimplified pictures of the real-flow situation, especially near the tube wall. To prove this point, Dixon presented CFD simulations for both a full-bed and for near-wall segments of a fixed-bed reactor tube and discussed the importance of such simulations. Dixon's visit was hosted by Douglas Harrison.

Roland Horst

University of Massachusetts

“Compression of Flexible Foams under Simultaneous Shearing and Long Term Stress Relaxation”

March 15, 2002

The focus of Roland Horst's presentation was foam, which, as he pointed out, covers a broad range of materials from shaving cream to the flexible polyurethanes that cushion our seats. In particular, Horst discussed solid foams with an elastomeric matrix from a mechanical point of view. These highly structured materials exhibit rich mechanical response under shear and elongational strain. The shear strain causes a normal stress whose dependence on the applied shear strain is very different from that of the solid rubber forming the matrix of the foam. At low compression, the normal stress decreases with increasing shear strain in contrast to solid-elastic materials that show an increase of normal stress. The stress relaxation behavior of these heterogeneous systems also deviates from that of solid elastomers and extends over very long times with many modes. Horst presented a custom-built device that measures the stress and also the incremental modulus — i.e. the slope of stress versus strain curve — without applying loading-unloading cycles and so without disturbing the aging process. Horst's visit was hosted by Kerry Dooley.

Ben J. McCoy

University of California, Davis

“Perspectives on Distribution Kinetics and Its Applications”

March 22, 2002

Ben McCoy's presentation examined the engineering importance of size distribution. Polymers are distributed in molecular weight, particles in mass, and phase-change clusters in number of molecules. McCoy explained how the kinetics and dynamics of such systems can be quantitatively described by population-dynamics equations. Applications discussed included polymer degradation and pyrolysis; particle fragmentation and agglomeration; and phase-transition dynamics, including nucleation, growth, and ripening for vapor-liquid (aerosol) or liquid-solid (crystallization) systems. McCoy's visit was hosted by Carl Knopf.

Jerry Spivey

North Carolina State University

“Environmental Catalysis: Multifunctional Catalysts for Aldol Condensation Reactions”

April 26, 2002

Jerry Spivey discussed the development of heterogeneous catalysts for aldol condensation reactions as an example of environmental catalysis. His particular focus was the synthesis of methyl isobutyl ketone (MIBK) from acetone. In this process, solid catalysts can replace aqueous-base homogeneous catalysts that produce a significant wastewater stream. However, these solid catalysts must have a proper balance of acid/base and selective hydrogenation properties. In Spivey's study, the condensation/selective hydrogenation reactions leading to MIBK from acetone were studied on a series of hydrotalcite (HTC)-supported noble metal catalysts in a liquid-phase batch microreactor. A 0.1 weight percent Pd/HTC catalyst gave the highest acetone conversion (38 percent) and selectivity to MIBK (82 percent), which is among the highest reported in the literature. The HTC catalyzes the condensation of acetone to diacetone alcohol (DAA) and its subsequent dehydration to mesityl oxide (MO), whereas the noble metal selectively hydrogenates the C=O bond in MO to MIBK. Spivey's visit was hosted by Carl Knopf.

Student News



Gregory Paul Blanchard

Senior chemical engineering student **Gregory Paul Blanchard** participated in Leadership LSU, Class of 2002. Blanchard was part of the group of 25 students who were chosen from a pool of 200 nominees for their demonstrations of leadership, their academic accomplishments, and their commitments to campus and community service.

Two posters were presented at the Nanocomposite Workshop at Argonne National Laboratories in Chicago by Ph.D. candidates **Qiang Huang** and **Amrit Panda** under the direction of Elizabeth Podlaha. One poster was titled "Electrodeposition of Ni-Cu-Alumina Nanocomposites" (A. Panda and E.J. Podlaha), and the other was titled "Electrodeposition and Characterization of FeCoNiCu/Cu Nanometric Multilayers" (Q. Huang, J.Y. Chan, D.P. Young, and E.J. Podlaha).

Suresh Raja and post doctoral researcher **Raghunathan Ravikrishna**, both students of K.T. Valsaraj, presented two papers at the American Institute of Chemical Engineers meeting in New Orleans in early March and will be giving another paper at the upcoming national conference of the Air and Waste Management Association.

American Institute of Chemical Engineers Student News

2002-03 Officers:

| | |
|--------------------|--------------------|
| President, | Billy Novak |
| Vice President, | Ricky Mincey |
| Secretary, | Rebecca Valladeres |
| Treasurer, | Zach Hoffman |
| EC Representative, | Kristen Rabalais |

The LSU Student chapter of AIChE recently participated in the Spring Regional Convention in San Juan, Puerto Rico. Thirteen students participated in the conference: Patrick Veillon, Jay Stephenson, Marilyn Caldero, Jesse Q. Bond, Greg Ritter, Chris Nichols, Cody Fontenot, Corey Caillouet, Dustin Flint, Billy Novak, Brooke Hester, Ryan Schexnaydre, and Rebecca Valladeres. The focus of the conference was networking and finding the right job after college. All participants found the conference extremely helpful.

AIChE also held its annual Dow Crawfish Boil on April 27. The faculty and student body all enjoyed time out of the classroom and some Louisiana boiled crawfish.

New AIChE officers were elected May 1. AIChE members wish them good luck and would like to thank the 2001-02 officers for donating their time: Patrick Veillon, president; Jay Stephenson, vice president; Marilyn Caldero, secretary; Jesse Q. Bond, treasurer; and Greg Ritter, college of engineering council representative. Additional thanks go to the following: Dwight Bordelon, Website manager; Chris Nichols, social chair; Zak Hoffman, junior representative; and Corey Caillouet, fundraising chair.

The LSU AIChE student chapter is supported through fundraising and donations.

2001-2002 Student Awards

Qiang Huang, student of Elizabeth Podlaha, was selected as a 2002–03 Dissertation Fellowship award winner.

2001–02 Scholarship Recipients

Southwest Chemical Association Scholarship

Jesse Q. Bond



Dr. Carl Knopf presents Senior Jesse Bond with a \$5,000 scholarship check.

Chemical Engineering Scholarship

Gaetano A. Aloiso
Janna M. Arcement
Justin E. Birdwell
Dorothy M. Clement
Jason P. Cox
Hongtram T. Nguyen
Kenneth M. Pontesso
Scott M. Pullins
Jay W. Stephenson
Brandon D. Stitt
Byron G. Sevin
Kassi J. Simoneaux
Kelly E. Seal

Chevron Scholarship

Darren J. Oufnac
Nia J. Harris

Gerard Family Scholarship

Marilyn Caldero
Jeremy M. Cash
Elaine V. Lim
André C. Marquette

Frank & Clara Groves Scholarship

Jennifer L. Bailey

Marathon Ashland Scholarship

Matthew K. Lemann
Barry M. Rogge

O. Dewitt Duncan Scholarship

Dwight P. Bordelon
Jesse Q. Bond
Kristen D. Rabalais

Paul M. Horton Memorial

Scott M. Harang
Bradley K. Pinkstaff
Ryan E. Varnado

R.L. Hartman Scholarship

William Lipham
Patrick Veillon
Kyle J. Zalman

Texaco Scholarship

Paul W. Martin
Jessica M. Reilly

Vulcan Scholarship

Lloyd M. Simms III

William McFadder Scholarship

Kim C. Trinh

Spring 2002 Commencement:



Many graduates attended the graduation reception hosted by the Chemical Engineering Department.

Bachelor of Science in Chemical Engineering

Gaetano A. Aloisio (*Cum Laude*)
 Janna M. Arcement
 Renée M. Arceneaux
 Justin E. Birdwell
 Gregory P. Blanchard
 Jesse Q. Bond (*Summa Cum Laude*)
 Dwight P. Bordelon
 Bryan P. Breaux
 Cory C. Caillouet
 Marilyn Caldero
 Dorothy M. Clement
 Candance S. Coutee
 Jason P. Cox
 Scott J. Cromwell
 Rusty J. Dauzat
 Benjamin P. Dugas
 Christopher J. Fogarty (*Cum Laude*)
 Cody M. Fontenot
 Troy J. Francois
 Louis M. Harb
 Ryan M. Kimmitt
 Ashley J. Leblanc
 Charie E. LeJeune
 Erin R. LeJeune
 Jacob E. Lemoine (*Cum Laude*)
 Thomas J. Lukowski
 Andre C. Marquette
 John Louis Meng, Jr.
 Coty S. Mitchell
 Steven H. Mula
 Hongtram T. Nguyen
 Toungvan T. Nguyen



A group of proud graduates poses for a picture.

Christopher S. Nichols
 Chris P. Pearce
 Scott M. Pollins
 Kenneth M. Pontesso
 Robin A. Price
 Gregory Wayne Randolph
 Margaret S. Reaves (*Cum Laude*)
 Karen C. Rhodes
 Stephen G. Ritter, Jr.
 Barry Rogge (*Magna Cum Laude*)
 Ryan J. Schexnaydre (*Magna Cum Laude*)
 Gregory W. Schneider
 Kelly E. Seal
 Manta R. Shah
 Kassi J. Simoneaux
 Angel S. Singleton
 Jay W. Stephenson
 Scott J. Templet
 Cheri A. Thibodeaux
 Kyle A. Thomas
 Kriangsak Vallopchotipong
 Patrick A. Veillon (*Magna Cum Laude*)
 Jarad J. Walker
 Allison P. White
 Frank A. Yacone (*Summa Cum Laude*)

Master of Science in Chemical Engineering
 Paul David Libbers

Doctor of Philosophy in Chemical Engineering
 Gang Guo
 Guangli Liu
 Liangfeng Sun

A Bit of Humor:

You Might Be a Chemical Engineer If . . .

- You have a favorite pump manufacturer.
- You see a good design and still have to change it.
- You can remember 7 computer passwords but not your anniversary.
- You've modified your can-opener to be microprocessor driven.
- You've actually used every single function on your graphing calculator.
- You've ever considered installing a scrubber on your chimney.
- Your ideal evening consists of fast-forwarding through the latest sci-fi movie looking for technical inaccuracies.
- You carry on a one-hour debate over the expected results of a test that actually takes five minutes to run.
- You cannot write unless the paper has both horizontal and vertical lines.
- You think the value of a book is directly proportionate to the amount of tables, charts and graphs it contains.
- You have a habit of destroying things in order to see how they work.
- You think that when people around you yawn, its because they didn't get enough sleep.
- Your work clothes are almost as old as you are.... and so is your car.
- When you look at objects in the distance and think of mean-free path.
- You actually use FORTRAN . . . and LIKE it.
(Reprinted courtesy of www.xs4all.nl/~jcdverha/scijokes.)

ABET Accreditation Survey Added to Alumni Website

The Accreditation Board for Engineering and Technology 2000 accreditation process requires our department to define a list of program outcomes and to establish an assessment procedure to determine whether these outcomes are being achieved.

We recognize that our alumni are a valuable resource for assessing the quality of our program and for developing suggestions to improve it. We have recently added a Program Outcomes survey page to our alumni website. You can access the survey through the Alumni News section of our department website at www.che.lsu.edu. The survey will give you an opportunity to rate the department in each of 13 areas that have been identified as desired program outcomes. You will also have a chance to list your own specific suggestions for improving our program, including your interest in participating in further curriculum development activities.

Alumni Updates

If you would like for us to print news of your latest achievements, please complete the enclosed card and return it to us. Or send us an e-mail at gradcoor@che.lsu.edu.

1940s

Robert B. Stobaugh (B.S. 1947) recently received Harvard Business School's highest faculty honor, the Distinguished Service Award. He is a member of the LSU Alumni Association Hall of Distinction and has endowed the Robert B. Stobaugh Alumni Professorship at LSU. Retired from active teaching at Harvard, Stobaugh is an active consultant to boards of directors. He resides in Belmont, Massachusetts.

1970s

Luis R. Canas (B.S. 1975) has been elected vice chair of the Nuclear Engineering Division (NED) of American Institute of Chemical Engineers (AIChE) for 2002 and will become chair in 2003. NED is the oldest division of AIChE.

Manolo Almeda Garcia (M.S. 1974) has retired after working for 27 years in the sugarcane industry. He is enjoying retirement—“doing some consulting and a lot of nothing.”

David Hurder (B.S. 1978) is vice president of McGean (Specialty Chemicals and Custom Manufacturing) in Cleveland, Ohio.

Norman K. Roberts (B.S. 1973) has been working for Dow Chemical Company in Freeport, Texas, since 1974 in process research and process engineering (which includes building NO_x neural nets and models and becoming “black belt” in environmental tech center). His wife Patty, daughter, Jennifer; and son-in-law, Paul Mefford, all work for Dow. He also enjoys spending as much time as possible with his granddaughter, Madison.

Alumni Updates (cont.)

1980s

W. David Constant (B.S. 1977, M.S. 1980, Ph.D. 1984) is a professor in the Department of Civil and Environmental Engineering at LSU. He is also the assistant director of LSU's Hazardous Substance Research Center/S&SW.

Ahuja Kanwal (B.S. 1984) works as a process engineering section manager for Jacobs Engineering in Baton Rouge.

Mark D. Oppenheim (B.S. 1982) is currently a principal with the Keystone Consulting Group, a 20 person management consulting firm focused on middle-market manufacturing and distribution companies in the Midwest. He joined Keystone in July 1999 after spending more than 13 years with Shell Chemical Company in engineering, operations, and sales. With Shell, he spent time at the Norco and Taft manufacturing plants in Louisiana, the Head Office in Houston, and the Chemical Sales Office outside of Chicago. After graduating from LSU, he joined Waldemar S. Nelson Engineers and Architects in New Orleans where he worked for four years before joining Shell. He also received a master's degree in business administration from Tulane University in 1990.

Satyajit Verma (B.S. 1980) is a senior process development engineer for Ticona Corporation in Bishop, Texas.

1990s

Steve Barrow (B.S. 1998) is a process specialist for GE Betz in the Baton Rouge and New Orleans areas.

Alicia Butler (B.S. 1999) is working as an environmental engineer for the Monsanto Company.

Amy DeAngelo (B.S. 1995) works as a control systems engineer for Shell Chemical Company in Geismar, Louisiana.

Jeremy Ford (B.S. 1998) works as process engineer for Halliburton KBR.

Vaughn Hart (B.S. 1995, M.S. 1998) works for eConvergent, Inc., as a senior engineer.

Erika Jefferson (B.S. 1992) is the lubricants business manager at Chevron Lubricants.

Todd Marcello (B.S. 1993) is an operational excellence engineer for Vulcan Chemicals in Geismar, Louisiana. He and his wife, Dana, and his son, Taylor, live in Baton Rouge. In his free time, he enjoys SCUBA diving, hunting, salt-water fishing, jogging, and gardening.

Chris Rowzee (B.S. 1997) has worked for Shell Information Technology International as an information technology consultant since 1997.

Adrian Sherrill (B.S. 1996) works for Intel Corporation in Portland, Oregon.

Sudhanshu Thakur (B.S. 1993) is a computer programmer with GlaxoSmithKline in Research Triangle Park (RTP), North Carolina.

Jessica White (B.S. 1998) is working as an operations engineer for BASF in Geismar, Louisiana.

2000

Donald F. Hebert (B.S. 2000) has a new job as a process engineer with Cryovac in Iowa City, Texas. When not working, he enjoys golf, fishing, hunting, and working out.

In Memoriam

We were saddened to learn of the passing of the following alumni. We extend our belated condolences to their families and friends.



Austin C. Abshier (B.S. 1957)
 James William Bridges (B.S. 1940)
 Varner E. Dudley (B.S. 1942)
 Gene Armond Freiss (B.S. 1950)
 Melvin J. Guillory, Sr. (B.S. 1940)
 Ruble Landis Huff (B.S. 1951)
 Edward S. Johnson (B.S. 1940)

Joseph Kernan Kendrick (B.S. 1950)
 George Lappin (M.S. 1965)
 Bueno Jaime Porres (B.S. 1966)
 Sidney Schulder (B.S. 1939)
 William Owen Switzer (B.S. 1937)
 Frank W. Valls (B.S. 1935)
 Guy G. Vanderpool (B.S. 1935)

Alumni Questionnaire

WE WOULD LOVE TO HEAR FROM YOU!

Please complete and return the following information form to:
 Gordon A. & Mary Cain Department of Chemical Engineering / Louisiana State University / Baton Rouge, Louisiana 70803-7020
 Or you can submit the information electronically to gradcoor@che.lsu.edu or through our website, www.che.lsu.edu

| | | | |
|---|----------------|---------------------------------|-----|
| FULL NAME | | NAME WHILE AT LSU, IF DIFFERENT | |
| YEAR GRADUATED | | LSU DEGREE(S) | |
| ADDRESS | CITY | STATE | ZIP |
| HOME TELEPHONE | WORK TELEPHONE | E-MAIL | |
| OCCUPATION | | WORK ADDRESS | |
| CURRENT ACTIVITIES (NEW JOB, RETIREMENT, HOBBIES, RECENT EVENTS, ETC.): | | | |
| _____ | | | |
| _____ | | | |
| _____ | | | |

THANK YOU FOR YOUR TIME AND COOPERATION!



LOUISIANA STATE UNIVERSITY

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