IOWA STATE UNIVERSITY Department of Chemical and Biological Engineering

2015 Issue 26







Alums Joe Cunning, Judson Harper enter CBE Hall of Fame



Dr. Andrew C. Hillier, Wilkinson Professor and Chair, Department of Chemical and Biological Engineering.

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Dear Alumni and Friends,

2015 has been a busy and exciting year in the Department of Chemical and Biological Engineering at Iowa State University. This year's issue of *ActiveSite* is full of news of the achievements and activities of our faculty, staff, students and alumni.

Students – This year has seen continued growth in our student numbers, with increases in both undergraduate and graduate enrollments. We are now up to 824 undergraduates majoring in chemical engineering, which is an increase of 30 students over last year and represents another record high for the department (**p.4**). Chemical engineering is now the second largest engineering major at Iowa State University and is also the fourth largest major on campus.

Our graduate program has also grown. We have an excellent class of new graduate students who joined us this fall and have helped us bring our total up to 74 students, most pursuing a Ph.D. Thanks to the generous support of many of our alumni and friends, we were able to award fellowships to many of our incoming Ph.D. students (**p.16**). These students make a huge impact in our research programs and also as teaching assistants for our undergraduate lab and lecture courses.

Thanks to generous gifts from all of you, we were able to award nearly \$500,000 in fellowships (**p.16**) and scholarships (**pp.22-23**) to our students this year. Our chemical engineering students have been very active in organizations and events. The AIChE student chapter hosted our inaugural CBE Showcase (**p.16**) and also helped arrange our first CBE tailgate event at the ISU football game against Kansas on Oct. 3 (**p.20**). We were delighted to see many alumni and friends stop by before the game, and we look forward to hosting another pre-game event next fall. I hope to see you there. Our students also produced two competitive "ChemE Car" entries for the regional AIChE competition (**p.19**). We were thrilled to see so many of our alumni back on campus with their employers to recruit our students in the fall Engineering Career Fair (**p.17**).

Faculty – We are pleased to be joined by two new faculty members this year: Thomas Mansell as assistant professor and Karen Haman as lecturer (**p.9**). We also celebrated the career of Chuck Glatz, who retired after 40 years with the department (**p.8**). Congratulations to Dennis Vigil for promotion to full professor (**p.8**). We are also quite proud of the various accolades our faculty have received this year, including awards such as Anson Marston Distinguished Professor to Brent Shanks, University Professor to Derrick Rollins, Outstanding Achievement in Research to Balaji Narasimhan, and the Superior Engineering Teaching Award to Monica Lamm (**p.7**).

We congratulate Surya Mallapragada for being named the inaugural Carol Vohs Johnson Chair ("Carol's Chair") in Chemical and Biological Engineering. We are delighted to be able to recognize Surya's excellent

work and to honor the life and legacy of Carol Johnson (**p.5**). We also celebrated the naming of Wenzhen Li as the inaugural holder of the Seagrave Professorship (**p.6**). Dick Seagrave was on campus for the event, and celebrated along with other CBE alumni, including Mary Jane and Randy Hagenson, Lanny Robbins, and Wayne Dunshee.

Research – Our department's research activities continue to make major advances in a broad range of areas, including biorenewables, health care, nanomaterials, computation and energy. This past year saw expenditures of nearly \$9 M in externally funded research. We also participated in the dedication of the new \$5.3 M Bio-Polymer Processing Facility at Iowa State University's BioCentury Research Farm (**p.12**), a project led by CBE faculty member Eric Cochran. We also congratulate the Center for Biorenewable Chemicals (CBiRC) for being awarded its final three years of funding. This center, as directed by Brent Shanks and involving CBE faculty members Zengyi Shao, Laura Jarboe, Jean-Philippe Tessonnier, and Jackie Shanks, has received the maximum funding from the National Science Foundation, with a ten-year contribution at over \$35 M (**p.13**).

Alumni – CBE alumni continue to play a major role in the department and several were recognized this year for their career achievements. We made a clean sweep of the College of Engineering alumni awards this year, including Professional Progress in Engineering Awards to Michael Determan and Venkat Raman (p.11), Professional Achievement Citation in Engineering to Robert Lane, and Anson Marston Medal to Mary Jane Hagenson (p.10). We also introduced two new members to the CBE Hall of Fame: Joe Cunning and Judson Harper (p.11). Congratulations to all. The CBE Advisory Council continues to be a key constituent group to help guide the department, and this year we thank Mary Jane Hagenson, Robert Lane, Leigh Thompson, and Dennis Vaughn for their tremendous service as they complete their terms on our council (p.14).

Department – CBE's unprecedented enrollment growth has been accompanied by lots of activity within the department. To help deal with increasing student numbers, we have added a number of new staff members to the department. We are delighted to welcome eight new staff (**p.15**) to the CBE family. Sweeney Hall has also continued to receive upgrades and improvements. These include a makeover of Sweeney's main office to add new staff space, improvements to several computer labs, and upgrades to two of our research labs (**p.14**). Many thanks to our alumni and friends for helping to make these renovations possible.

I hope you enjoy reading this issue of *ActiveSite*. I also invite you to stay in touch with the department by viewing our website (www.cbe.iastate.edu), and following us through social media on Facebook, Twitter, and LinkedIn. Please send me any comments or suggestions you have for future issues of our newsletter, or just to say hello. I would be delighted to hear from you.

My best wishes to all of you for a happy, healthy and productive 2016. Go Cyclones!

Andrew C. Hillier

Andrew C. Hillier Wilkinson Professor and Chair Department of Chemical and Biological Engineering

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Professor Surya Mallapragada is named the inaugural "Carol's Chair" in memory of CBE alum Carol Vohs Johnson.

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CBE's Wenzhen Li is honored as the first Richard C. Seagrave Associate Professor.

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University honors for CBE faculty include Dr. Brent Shanks named Anson Marston Distinguished Professor of Engineering; Dr. Derrick Rollins named University Professor; Dr. Balaji Narasimhan honored for Outstanding Achievement in Research: and Dr. R. Dennis Vigil named Professor and receiving the Regents Award for Faculty Fxcellence

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Tom Mansell, Karen Haman join CBE faculty. Page 9



CBE alums Mary Jane Hagenson and Bob Lane are honored with the Anson Marston Medal and PACE Award, respectively.

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CBiRC receives maximum funding from NSF Page 13

Sweeney Hall improvements Page 14



















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Hagenson, Lane depart Advisory Council Page 14

New CBE staff members Page 15



activesite staff

Iowa State University

Biological Engineering

Chemical and

Andrew C. Hillier Wilkinson Professor and Chair, Department of Chemical and Biological Engineering

John Burnett-Larkins **CBE** Communication Specialist

Michelle Stotts **CBE** Operations Manager



Professor Chuck Glatz retires from CBE.

IOWA STATE UNIVERSITY Department of Chemical and Biological Engineering

Enrollment (Fall 2015)

Undergraduate: 824 (new record enrollment; second largest major in College of Engineering; fourth largest major at Iowa State)

Graduate: 74

Scholastic Achievement

Avg. comp. ACT Score (undergrad 2014): 28
 Avg. GRE Scores (graduate) 2015-16:
 Verbal 153; Quantitative 159; Writing 3.29

Facilities

Sweeney Hall/ Biorenewables Research Lab

- 35,000+ sq. ft. research space
- 9,000+ sq. ft. teaching space
- 3,800 sq. ft. computer labs
- 125+ student computer work stations
- 9,000 sq ft. office space
- 1,000 sq. ft. conference space

Degrees Awarded (2014-15 Academic Year)

- B.S. 110
- M.S. & M.E. 6
- Ph.D. 10







by the numbers

Department Faculty

- Endowed Positions
- 3 Endowed Chairholders
- 5 Endowed Professorships
- 4 Faculty Fellowships
- 2 Distinguished Professors
- 2 University Professors
- 7 Professors
- 5 Associate Professors
- 6 Assistant Professors
- 2 Adjunct Professors
- 4 Lecturers

Research

Direct Research Expenditures: \$8.85M (FY 2015)

Scholarships & Fellowships

- Undergraduate scholarships
 (awarded in 2014-15): 259, totaling
 \$367,853, impacting 228 students
- 14 graduate fellowships: \$125,281

Rankings

(Iowa State University Chemical Engineering, *U.S. News & World Report*, Best College Rankings, 2015-16)

Undergraduate: 20th overall, 15th public
 Graduate: 31st overall, 22nd for public universities









Department Vision: To be internationally recognized as the Chemical and Biological Engineering department that best exemplifies the dual commitment to outstanding research and excellence in student education.

Department Mission: To provide a high-quality education in chemical and biological engineering at the undergraduate and graduate levels that prepares graduates for productive careers in engineering and related fields, and for life as educated, effective citizens and leaders. Discover and disseminate new knowledge in science and engineering through creative activity in research and scholarship. Provide service to the state, nation, and world by advancing the profession of chemical engineering.



Surya Mallapragada receives "Carol's Chair" through endowment gift



Dr. Surya Mallapragada (second from left) is joined by (left to right) Sarah Rajala, Dean of the College of Engineering, donor Jack R. Johnson, and University Senior Vice President and Provost Jonathan A. Wickert at her medallion ceremony for Carol's Chair.



Provost Wickert places the Carol Vohs Johnson Chair medallion on Surya Mallapragada.

Dr. Surya Mallapragada has been recognized as the inaugural Carol Vohs Johnson Chair ("Carol's Chair") in Chemical and Biological Engineering. Donor Jack R. Johnson and Dr. Mallapragada were joined by Iowa State University Senior Vice President and Provost Jonathan A. Wickert; Sarah Rajala, Dean of the College of Engineering; CBE department faculty and staff: and friends and family members in a special ceremony.

The honor is made possible

by an endowment gift from Jack Johnson in memory of his wife, Carol Vohs Johnson, who received a B.S. in Chemical Engineering from Iowa State in 1980. Carol passed away in 2014 from cancer. She met Jack (B.S., Computer Engineering, 1981) in a math class while they were enrolled at Iowa State as undergraduates. Both became very connected to the College of Engineering, and considered it to be part of their family for life. "Carol's Chair," as the endowment is to be known, celebrates her life and legacy.

"It is an incredible honor for me to be associated with Carol Vohs Johnson's name through this wonderful chair that Jack Johnson has created," said Dr. Mallapragada. "Carol was a pioneer, going into a discipline where there were not many women. Today, chemical engineering is a welcoming and

highly diversified discipline with one of the highest percentages of women in engineering, thanks to trailblazers like Carol."

Dr. Mallapragada said funds from Carol's Chair will be used in many ways, including advancing her research in technologies to develop novel therapies in fighting cancer and infectious diseases. "These funds will also be used to recruit high quality students, especially women, to work in my laboratories," she stated.



A memorial plaque from Carol Johnson's funeral was displayed at the ceremony honoring her named chair.



Senior Vice President and Provost Jonathan A. Wickert at the medallion ceremony for Dr. Surya Mallapragada, the holder of the inaugural "Carol's Chair."

It was a love affair that ended too soon. But from that same union, a love affair with Iowa State University and the Department of Chemical and Biological Engineering has endured, and now helps us remember one of the department's own through the spirit of generosity.

Carol Vohs Johnson, an ISU chemical engineering graduate in 1980, passed away in 2014 at the age of 56. But in working with her husband, Jack, to establish a generous endowment for the department, "Carol's Chair" continues her legacy at the institution she loved.

Jack Johnson, a computer engineering student at Iowa State, met Carol in a differential equations math class when both were undergrads. Carol, a trailblazer for those days as a woman studying chemical engineering, was one of only two girls in the class, "and the other one already had two boyfriends, so I started sitting next to Carol," muses Jack.

> Jack says that Carol loved the professors and personal feel of the chemical engineering department, and Jack, though not a ChemE student, grew to love it as well. Both came to consider the College of Engineering as part of their family, long after graduating. Carol went to work for Dow Corning Corporation and was then employed by Monsanto for 20 years. 'She was doing real old school chemical engineering work for Monsanto," says Jack, "working with sulfuric acid, in places where the standing joke was 'if something is dripping on your head, don't look up!" Carol also obtained an MBA from Maryville University, where she graduated Summa Cum Laude in 1988.

Through the years, Carol and Jack supported the College of Engineering and CBE in their hearts and in actions as

well. Carol served on the CBE Advisory Council from 1996-2002 and also received the ISU Professional Progress in Engineering award in 1992. Both Carol's and Jack's families had other members that attended Iowa State, including one of Carol's sisters, who graduated at the top of her class from ISU's College of Veterinary Medicine. Carol and Jack put their support of Iowa State into full motion with the establishment of the Jack R. and Carol A. Johnson Engineering Fund for Academic Excellence. The current and inaugural holder of that fellowship is CBE's Dr. Jean-Philippe Tessonnier. With the establishment of "Carol's Chair," that support makes a great leap forward. Jack says it was something that needed no pondering. "This just fell like the right thing to do," said Jack Johnson in making the decision about the endowment, which he and Carol discussed prior to her death. "And to be able to do it now is important," he said, "because I will be able to see the benefits, and it will be rewarding to see the impact it will have."

Inaugural Seagrave Professorship presented to CBE professor Wenzhen Li

Chemical and Biological Engineering professor Dr. Wenzhen Li has been recognized as the department's inaugural Richard C. Seagrave Associate Professor. Dr. Li was joined in the ceremony by many individuals, including Donors Randy and Mary Jane Ha-



genson, honoree Richard ("Dick") Seagrave, Iowa State University Senior Vice President and Provost Jonathan A. Wickert, Dean of the College of Engineering Sarah Rajala, and department alumni and donors Lanny Robbins and Wayne Dunshee, who are among additional contributors to the professorship.

Dr. Wenzhen Li (center) is joined by many supporters at his Seagrave Professorship medallion ceremony, including donors and university officials.

The Seagrave Professorship was established to honor

the lifelong impact that Seagrave, Anson Marston Distinguished Professor Emeritus of Iowa State's Chemical and Biological Engineering faculty, has had in his profession, as well as the lasting influence he has had on the people that know him well. Dick Seagrave pursued his career well beyond the scope of chemical engineering.

Li's research specialty deals with using electrocatalysis and electrochemical processes and systems for advancing clean and sustainable energy resources through such things as fuel cells and biorenewable fuels. He said he is honored to be bestowed with a professorship in honor of Seagrave, who was a pioneer in the development of biomedical engineering at Iowa State, among many other accomplishments. "He was an ex-

cellent teacher, adviser and administrator. Now, nearly 50 years after he came to Iowa State, we face unique challenges in many areas, such as developing new energy systems. His vision and spirit will motivate me in my work. And the professorship in his name will also help me to bring in talented students to work with and mentor. We will work hard to use this honor to advance the prominent research position of Iowa State."

Mary Jane Hagenson received a B.S. in physics from Iowa State in 1974 and then, under the guidance of Seagrave, received a M.S. and Ph. D. in biomedical engineering in 1976 and 1980, respectively. Randy received a B.S. in electrical engineering in 1972, and a



Donors Mary Jane and Randy Hagenson address attendees at Li's medallion ceremony.

M.S. and Ph.D. in nuclear engineering in 1973 and 1978, respectively. "But, it is people who make the difference," Mary Jane said, citing Seagrave's support as making a large impact. She and Randy were married when she was a freshman at Iowa State and the couple had their first child when Mary Jane was a sophomore. "I was a very non-traditional student," she said, when she expressed an interest in studying biomedical engineering with Seagrave. "If not for Dr. Seagrave and his willingness to do something outside of the envelope in allowing me in, we never would have gotten as far as we did in life," she remarked, referring to herself and husband Randy. In that spirit, the Hagensons created the Skogen-Hagenson Scholarship to benefit students majoring in chemi-

cal engineering at Iowa State, with special consideration given to students facing challenging circumstances or who are not receiving other scholarship support.

Dr. Li began his work with Iowa State's Department of Chemical and Biological Engineering in 2014 as an associate professor. He also serves as an associate scientist within the Department of Energy's Ames Laboratory. Prior to Iowa State, Dr. Li taught within the Department of Chemical Engineering at Michigan Technological University. He is a member of the Electrochemical Society, Ameri-Dr. Li delivers remarks during can Chemical Society, and American Institute of Chemical Engineers. He has over 70 peer-reviewed journal papers with more than



7,600 citations, has participated in more than 30 conferences and/or invited talks since 2008, and is listed as a contributor for five patents.



Dr. Seagrave joined the Iowa State faculty in 1966 as an associate professor of Chemical Engineering after receiving his M.S. (1959) and Ph.D. (1961) in Chemical Engineering from ISU. He was named professor in 1971 and Anson Marston Distinguished Professor of Engineering in 1982. Serving the university in a variety of roles, Seagrave has been professorin-charge of ISU's biomedical engineering program, chair of the Department of Chemical Engineering, interim provost, and interim president. Throughout his career he served as an adviser for more than 300 students. "Even as interim president he continued advising, and his door was always open to his students," remarked Provost Wickert.

Dr. Seagrave speaks to ceremony guests.

Seagrave is the recipient of numerous honors and/or awards, including: Iowa State's Margaret Ellen White Graduate Faculty Award in 1995, the

ISU Presidential Service Award in 1998, Iowa State's Thomas B. Thielen Award in 1998, the Carnegie Foundation for the Advancement of Teaching/Council for the Advancement and Support of Education (CASE) Iowa Professor of the Year in 2000, and the ISU Order of the Knoll Staff Excellence Award in 2004. He has also won the Outstanding Teaching Award in chemical engineering more than ten times. "We are in the business of changing and improving lives," remarked Seagrave, "Whether through research, teaching or mentoring. Everything we do has a profound effect on our students."

Shanks, Narasimhan, Rollins, Vigil recognized with university honors







CBE faculty receiving certificates from President Steven Leath include (top to bottom): Dr. Brent Shanks (to Anson Marston Distinguished Professor), Dr. Derrick Rollins (to University Professor), and Dr. Balaji Narasimhan (Iowa State University Award for Outstanding Achievement in Research).

Four faculty members from the Department of Chemical and Biological Engineering received honors in Iowa State University's 2015 Faculty and Staff Awards ceremony.

Dr. Brent Shanks, Mike and Jean Steffenson Professor of Chemical and Biological Engineering, was recognized for being named **Anson Marston Distinguished Professor in Engineering.** Distinguished Professor is the highest honor the university bestows. Shanks is the Director of the NSF Engineering Research Center for Biorenewable Chemicals (CBiRC).

Dr. Derrick Rollins was honored as **University Professor** in chemical and biological engineering. The title of University Professor is conferred on a faculty member who has acted as a change agent by having made significant contributions to improve the university, and who has demonstrated outstanding performance in at least one other area of faculty responsibility.

Dr. Balaji Narasimhan, Vlasta Klima Balloun Professor of Chemical and Biological Engineering, received the Iowa State University Award for **Outstanding Achievement in Research**.

Dr. R. Dennis Vigil, professor of chemical and biological engineering, was honored as a recipient of the **Regents Award for Faculty Excellence**. The award is presented by the Board of Regents to recognize tenured faculty members who are outstanding university citizens and who have rendered significant service to the university and/or to the state of Iowa. He is to be further recognized at an upcoming ceremony for the recipients of this award.

College of Engineering Convocation includes CBE honorees

Chemical and biological engineering faculty members were among those honored at the College of Engineering 2015 Convocation.

Among new named faculty positions recognitions included **Dr. Wenzhen Li, Richard Seagrave professorship** (see separate story on page 6); and **Dr. Kaitlin Bratlie, Michael and Denise Mack Fellow.**

Those recognized for patent awards were **Dr. Robert Brown**, **CBE professor**, for selective temperature quench and electrostatic recovery of bio-oil fractions; and **Dr. Balaji Narasimhan**, for antimicrobial polyanhydride nanoparticles.

Faculty and staff award recognition went to Dr. Monica Lamm, Superior Engineering Teaching Award; and Dr. Balaji Narasimhan, D.R. Boylan Eminent Faculty Award for Research.



Pictured receiving awards from Dean Sarah Rajala at the Convocation are top, left to right: Dr. Balaji Narasimhan (D.R. Boylan Eminent Faculty Award for Research), Dr. Monica Lamm (Superior Engineering Teaching Award); bottom, left to right: Dr. Kaitlin Bratlie (Michael and Denise Mack Fellow), and Dr. Robert Brown, CBE professor (patent award). Dr. Narasimhan also received a patent award at the ceremony.

CBE's Dr. R. Dennis Vigil is named professor



Dr. R. Dennis Vigil has been named Professor of Chemical and Biological Engineer-

ing. He has been with the department since 1994 and is CBE's Director of Research. His primary research interest area deals with simulating the behavior of multiphase processes.

Tom Wheelock celebrates 90th birthday in 2015

Emeritus Professor Tom Wheelock was honored with a department reception on his 90th birthday. Wheelock has had a 70-year relationship with Iowa State. He earned a bachelor's degree and Ph.D. in Chemical Engineering from Iowa State in 1949 and 1958, respectively. He joined the department as an instructor in 1957. He was named assistant professor in 1958 and had become a professor by 1964. He has been heavily involved in research for many years.



Tom Wheelock is pictured at his department birthday reception.



Dr. Yue Wu, Associate Professor and Herbert L. Stiles Associate Professor in the Department of Chemical and Biological Engineering, received the Council for Chemical Research (CCR) Rising Star Award.

Wu was recognized at the Council's 2015 Annual Meeting in Alexandria, VA, along with six other individuals

nominated by different sectors of the Council as professionals expected to be influential leaders in the future.

Yue Wu named chemical council "Rising Star"

Qun Wang receives CCFA Career Award



Dr. Qun Wang, adjunct assistant professor in Chemical and Biological Engineering, was awarded the 2015 Career Award by the Crohn's and Colitis Foundation of America (CCFA). Funding for Wang's award will be applied over three years and will be used to help the research to fight inflammatory bowel disease.

One article by the Wang lab, "An Intestinal Trojan Horse for Gene Delivery," was chosen as a front cover selection of Nanoscale, a leading journal in nanoscience and nanotechnology.

Monica Lamm to Emerging Leaders Academy



Dr. Monica Lamm was chosen to participate in the cohort of Iowa State's Emerging Leaders Academy, ELA is an academic-year initiative to develop faculty and professional & scientific staff currently serving in leadership roles at Iowa State, or who aspire to hold leadership positions.

Beginning in August 2015, participants have attended monthly sessions on leadership theory and practice, current issues in higher education, and university-related challenges and opportunities. Through the year, each participant also participates in a mentoring relationship with a current Iowa State leader.



Chuck Glatz (left) holds a commemorative photo tirement reception.

Chuck Glatz retires from CBE after 40-year career at lowa State

Dr. Charles E. (Chuck) Glatz, University Professor, announced his retirement from CBE after 40 years of research, education and leadership at Iowa State University.

Originally from Rochester, NY, Glatz came to Iowa State in 1975, after earning his Ph.D. from the University of Wisconsin. He was appointed to a five-year term as CBE department chair in 1997, and then agreed to a three-year extension, leading the department until 2005. He also served as interim Dean of the College of Engineering for a six-month period in 2005.

Glatz is a nationally recognized researcher in bioprocessing, with work in fermentation, product recovery and byproduct utilization. He was involved in many research projects at Iowa State, including leading a team which secured an Iowa State University Biotechnology Council and National Science Foundation grant to study processes to reduce costs for the production of album given to him by ChE alum and CBE Advi-vaccines and enzymes using fermentation; and a 2002 sory Council member John Kaiser at Glatz' re- team project funded by the USDA which focused on the recovery and purification of recombinant proteins from plants.

While he was ChemE chair, the Iowa State University Plant Sciences Institute was launched. It

included centers performing work in all of the university's colleges, as well as involving 30 departments and a number of affiliated organizations dedicated to generating knowledge and practices for the creation of valuable traits in Iowa crops using genomics and bioinformatics. The Department of Chemical Engineering played a critical part in the development of the institute.

Glatz was also involved in the name change for his department, from Chemical Engineering to Chemical and Biological Engineering, which became official in 2005, as part of a national trend to recognize the importance of the biochemical field.



Glatz is congratulated by Sarah Rajala, Dean of the College of Engineering, at his retirement reception. In addition to his professor position, Glatz also served as chair of the chemical engineering department.

Thomas Mansell, Karen Haman are newest additions to CBE faculty

Medical conditions such as diabetes, obesity and depression can be Mansell, his wife, a two-year-old daughter and a newborn are settling into ready exist within the human body. And Dr. Thomas Mansell wants to develop the ways to do that through research that he brings to the Department of Chemical and Biological Engineering at Iowa State as a new associate professor.



Having completed more than four years of postdoctoral research in synthetic biology for cellular circuits and chemical genomics, Mansell is eager to begin his own adventure as a researcher and educator at ISU. "There is great potential for collaboration in this department," he said. "And when I looked at the many things going in different areas and different departments at Iowa State, it says to me that there is a great synergy with the research I'm proposing."

Dr. Thomas Mansell

"This is a way to engineer human health by working with bacteria," Mansell explained. "There are bacteria all over the place, but there are mixed populations of it in different parts of the body – in the gut, in the skin, and more. The makeup of these has a lot to do with many common medical conditions. The question the kind of research I do asks, 'How can we manipulate these communities of bacteria to treat and prevent disease?' For example, we can supplement food with substances that encourage the growth of good bacteria - or have bacteria engineered to reside in the body and secrete beneficial products."

In addition to managing work in his own research lab, Mansell also instructs CBE students in the subject of chemical engineering separation CH E 358. More than 100 students are enrolled in the course.

Mansell received a B.S. and M.S. in chemical engineering from The Johns Hopkins University, and a Ph.D. in chemical and biological engineering from Cornell University. His postdoctoral work was done at the University of Colorado, Boulder. "I started doing research as an undergrad at Johns Hopkins," said Mansell, "and I can't stress enough how important it is to get started on that as an undergrad."

addressed through the engineering of bacterial communities that al- Ames, where he says they feel right at home. He's from rural Pennsylvania and his wife is from Massachusetts, with neither having big-city roots. "When it came down to it, Ames was a no-brainer," he said.

> To date, Mansell has co-authored numerous published research projects, has been involved in many conference presentations and has also been an invited presenter and guest lecturer



Dr. Karen Haman enjoyed two summers of undergraduate research in Materials Science and Engineering at Iowa State. Now, as a recentlyhired lecturer in Chemical and Biological Engineering, the native of nearby Huxley, Iowa said she was ready to embrace a return to ISU. "This is like a homecoming for me," said Haman, who completed her Ph.D. program in chemical engineering at the University of Minnesota shortly before being hired at ISU.

Dr. Karen Haman

Her thesis research involved mechanistic investigations of a family of block copolymer surfactants and

their therapeutic interactions with compromised cell membranes. The work was done in collaboration with the medical school at Minnesota. She received a B.S. in chemical engineering from The University of Iowa in 2009.

Haman said while teaching was always an interest of hers, it wasn't until her graduate school experience that she began to think of it as a career choice. "It was during a certain teaching assistant assignment in product design when I began to consider it," she said. "As part of that class, the full range of chemical engineering principles were employed in project-based learning, alongside ever-important communication skills. I found the combination enjoyable and rewarding, and I really enjoyed working with students to become better communicators."

That desire to help students advance through communication has become a driving force. "As a lecturer, I will be seeking ways to grow my students' confidence in conveying their technical expertise clearly and accurately to the mixed audiences they will encounter in the marketplace," she emphasized.

Haman teaches CH E 426, Chemical Engineering Lab II, and teamed with Dr. Matthew Panthani to teach CH E 381, Chemical Engineering Thermodynamics. in the fall semester.

Rodney Fox named to Belgian Francqui Chair



Professor Rodney Fox has been appointed to an International Francqui

Professor Chair as part of the Francqui Foundation, based in Belgium. Dr. Fox was nominated by Guy Marin of Ghent University, a public research university in Ghent, Belgium and has been recommended by four Belgian universities and three research institutes.

The Francqui Foundation invites scientists for stays at Belgian universities where they participate in scientific life and provide specialized teaching. Fox will travel to Belgium for a six-month stay in late 2016 and early 2017. His main host will be Laboratory for Chemical Technology in Ghent, Belgium.

The chair is named for Emile Francqui, a Belgian serviceman, politician and business man. He and President Herbert Hoover established the foundation in 1932 to support higher education and research in Belgium.

ALUMNI NEWS

CBE alums Hagenson, Lane honored with Marston Medal, PACE award in university ceremonies

Two alumni of the Department of Chemical and Biological Engineering were honored by the department and by the Iowa State University College of Engineering during Homecoming week.

Dr. Mary Jane Hagenson and Robert (Bob) Lane received the Anson Marston Medal and Professional Achievement Citation in Engineering (PACE) award, respectively, at the Iowa State University Alumni Association's Honors & Awards Ceremony.



Mary Jane Hagenson is presented with the Anson Marston Medal by Sarah Rajala, Dean of the College of Engineering.



Dean Raiala at the university awards ceremonv

The Anson Marston Medal recognizes outstanding achievement in advancing engineering science, technology or policy having national and international impact in academics, industry, public service, government or other venues. It is named in honor of Anson Marston, who served as first Dean of Engineering at Iowa State, prior to retiring in 1937. Hagenson received a M.S. and Ph.D. in biomedical engineering from Iowa State in 1976 and 1980, respectively. Prior to that she received a B.S. in physics and mathematics in 1974.

Dr. Hagenson was vice president of research and technology for Chevron Phillips Chemical Company from the company's formation in 2000 until her retirement in 2012. In that capacity she was a member of the leadership team reporting to the CEO with responsibility for the company's research and technology efforts, Process Development & Engineering, and Licensing functions. Hagenson joined Phillips Petroleum Company (which became Conoco Phillips) in 1984 and served in a variety of R&D and business roles prior to the joint venture formation of Chevron Phillips Company in 2000.

In 2013 Hagenson was inducted into the Iowa State University Chemical & Biological Engineering Alumni Hall of Fame. In 2006 she received the College of Engineering Professional Achievement Citation in Engineering (PACE) Bob Lane accepts his PACE award from Award. Hagenson is a Governor of the Iowa State University Foundation. She formerly served as a member and chair of the College of Engineer-

ing Industrial Advisory Council at Iowa State, and has recently concluded a term as chair of the Department of Chemical and Biological Engineering's Advisory Council. Her husband, Randy, holds degrees in electrical and nuclear engineering from Iowa State. They have two daughters: Leigh Hagenson Thompson and Lara Hagenson Niles, both of whom received Ph.Ds from Iowa State.

The PACE Award, presented to Lane, was established in 1968 to recognize superior technical or professional accomplishments in research, development, administration, education, and other engineering activities; the citation recognizes alumni/alumnae eminently known for their professional competence and creativity.

Lane received a B.S. in chemical engineering from Iowa State in 1968. Upon graduation he began a 30-year career with the Shell Companies in New Orleans, Louisiana. He was primarily involved with Shell's offshore and onshore oil and gas exploration and production businesses throughout the United States and also held a position in London, England. He was manager of plans coordination and strategy for Shell Oil Company, general manager of engineering for the U.S. Exploration and Production lapragada. Company, vice president and general manager



Mary Jane Hagenson is joined by CBE emeritus professor Dr. George Burnet, who was a key figure in the department when Hagenson was a student.



Bob Lane is shown receiving congratulations from CBE professor Dr. Surya Mal-

of Shell Western E & P Company, and vice president of Shell E & P International Ventures, Inc., all in Houston.

After retiring from Shell, he became the chief operating officer of Sonat Exploration, an independent exploration and production company located in Houston. He is former chairman of The Gus Archie Memorial Scholarship committee, which is affiliated with the Society of Petroleum Engineers; American Institute of Mining, Metallurgical and Petroleum Engineers. He also is former chairman of the Board of Directors of PushAmerica, the national service organization of Pi Kappa Phi Fraternity.

Lane served on the Department of Chemical and Biological Engineering Advisory Council until stepping down in 2014.

CBE Hall of Fame inducts alums Joe Cunning, Judson Harper



Dr. Joe Cunning (left) and Dr. Judson Harper stand next to the 1962 and a Ph.D. in 1965. He department's Hall of Fame wall after plaques in their honor has risen to worldwide prominence in the field of exploratowere placed as the 2015 inductees.

He spent 28 years with the DuPont Company working in research and development of different fiber types and headed the corporation's Pioneering Research Laboratory. Since 1991 he has been president of Cunning & Associates, Ltd., which provides consulting services for the textiles research and development community. He was awarded the College of Engineering Professional Achievement Citation in Engineering (PACE)

award from Iowa State in 1988 and currently serves on the Iowa State University Foundation's Board of Governors.

Harper received a B.S. in chemical engineering in 1958, a M.S. in food technology in 1960 and a Ph.D. in food technology and bacteriology (with minors in chemical engineering and mechanical engineering) in 1963, all from Iowa State.



cal engineering alumni Dr. Joe

Harper were inducted into the

Department of Chemical and

Biological Engineering Hall of Fame in March. Both received

commemorative plaques and

have also had plaques in their

Cunning received three chemical engineering degrees at Iowa

State – a B.S. in 1958, a M.S. in

ry, long-range fiber research.

honor placed on the depart-

ment's Hall of Fame wall in

Sweeney Hall.

Cunning and Dr. Judson M.

Both inductees were featured and made

He worked for General Mills in the 1960s speeches at the annual department awards before joining Colorado State University in banquet.

1970 as a professor and department head

in the Department of Agricultural & Chemical Engineering. During his tenure he initiated the school's Chemical and Biological Engineering department. He was Vice President for Research and Information Technology, greatly expanding research initiatives and facilities. In 2002 he was designated Emeritus Professor of Chemical and Biological Engineering. He retired from Colorado State in 2004. Today the campus features the Judson M. Harper Research Complex, named in his honor.

CBE alums Determan, Raman are 2015 PPEA recipients

Iowa State University Chemical Engineering graduates Dr. Michael Determan (BS ChE/ Econ'01, PhD ChE'06) and Dr. Venkat Raman (PhD ChE'03) were named recipients of the university's Professional Progress in Engineering Award (PPEA). They were honored



their PPEA plaques from Sarah Rajala, Dean of the College of Engineering at the annual Marston Club Dinner.

with a department reception and at the annual Marston Club Dinner.

After completing his ISU undergraduate degree – which included internships at Fisher Controls Inc. in Marshalltown, Iowa and the Dow Chemical Company in Midland, Mich. - Determan continued his graduate studies in the Department of Chemical and Biological Engineering. Studying under Dr. Surya Mallapragada, he graduated with a Ph.D. in 2006.

Determan accepted a position as a polymer chemist at General Electric Plastics in Mt. Vernon, Ind. in 2005. In 2006 he moved to 3M in St. Paul. Minn. as a senior research scientist in the corporate materials research laboratory where he focused on pressure sensitive adhesive materials for optical electronic and health care applications. He is a co-author on 11 granted patents with 13 applications pending, seven journal articles and a book chapter. In 2009 Determan was awarded the 3M corporate level Circle of Technical Excellence and Innovation award in recognition for his work on Gentle to Skin CBE alums Michael Determan Silicone Adhesive technology. He is currently a technical (top) and Venkat Raman accept manager in the pressure sensitive adhesive and release materials cluster of 3M's corporate research laboratory.

> Dr. Raman is an Associate Professor of Aerospace Engineering at the University of Michigan. He was a NASA/

Center for Turbulence Research Postdoctoral Fellow at Stanford University from 2003-2004, and a research associate in the Center for Integrated Turbulence Simulations from 2004-2005. From 2005-2014 he was on the faculty of Aerospace Engineering and Engineering Mechanics Department at The University of Texas at Austin, initially as an assistant professor (2005-2011) and later as tenured associate professor (2011-2014).

Raman received a NSF CAREER award in 2008, a distinguished paper award at the International Combustion Symposium in 2013, and the Moncrief Grand Challenge Award in 2013. He held the Eli. H and Ramona Thornton Centennial Fellow in Engineering at UT Austin from 2013-2014. At Iowa State he studied under Dr. Rodney Fox, Chemical and Biological Engineering.

Bio-Polymer Processing Facility opens in 2015; seen as boon to ISU research and to lowa economy



Facility developers Eric Cochran of CBE (second from private and public investment left) and Chris Williams of CCEE (third from left) are in commercializing bio-polyjoined by respective chairs Andy Hillier (far left) and Terry Wipf (far right) at the facility plant dedication.



Many took advantage of tours at the dedication to gineering. Each professor reclearn more about the new facility.

ity represents tens of thousands of hours of concerted team effort by our researchers, colleagues, administrators, government officials, and business partners," Cochran said.

Williams spoke about the relevancy of research outcomes. "We fulfilled an industry research need, which bridges Iowa State University work with market demands for bio-polymers."

Brent Willet, executive director of Cultivation Corridor, moderated the dedication ceremony. Cultivation Corridor is an Iowa-based organization that works with public and private organizations to cultivate innovation and accelerate growth in the agbioscience, biorenewables, biotech and advanced manufacturing industries.

"The Bio-Polymers Processing Facility demonstrates a comprehensive public-private partnership stemmed from Iowa State ag and bio programmatic research," Willet said. "This is a tremendous growth opportunity for our state."

Iowa State University, in partnership with many state and national organizations, reached a milestone in commercializing bio-polymers.

More than 200 Iowa State faculty, staff and students, as well as university, corporate, and government partners, celebrated the dedication of the \$5.3 million Bio-Polymer Processing Facility August 26. The new facility at Iowa State's BioCentury Research Farm demonstrates mers, which can be used in sustainable, more environmentally friendly production of plastics and asphalt.

In 2011, an integral research partnership began between Chris Williams, the Gerald and Audrey Olson Professor of civil, construction and environmental engineering, and Eric Cochran, associate professor of chemical and biological enognized the benefits of bringing their teams together. "This facil-

Dr. Ian Schneider's research looks to unravel guestions about how cancer cells use "tracks" to spread within the human body



Dr. Ian Schneider

The research lab of CBE assistant professor Ian Schneider is in the second year of a grant funded by the National Cancer Institute. The grant funds work on understanding how cancer cells sense structure in the environment around tumors. Cancer biologists have observed that certain changes in the structure of the environment around the tumor correlate with cancer invasion and metastasis. Specifically, fibers composed of a protein called collagen are reorganized from randomly distributed fibers to fibers that project perpendicularly from the tumor. These

aligned fibers act as tracks for cells to quickly migrate into the surrounding tissue, allowing the cancer to spread.

One lingering question is do all cancer cells sense

these tracks the same? This has dramatic impact on using the presence of these tracks to accurately gauge the severity of cancer. The Schneider lab has refined several ways to organize collagen outside of the body in order to visualize the migration of different types of breast cancer cells. One approach includes inserting and rotating acupuncture needles within collagen gels to generate alignment. Another approach al-



lows for exquisite control over the growth of aligned collagen fibrils on mica, an atomically smooth surface. The Schneider lab recently published a paper outlining the dramatic differences seen among different breast cancer cells in their ability to interpret and respond to aligned fibers. Work that is currently being prepared to be published reveals that the ability of the cell to exert force on its environment is directly proportional to its ability to migrate directionally on these fibers. This finding suggests that information about certain genetic traits of cancer cells that specify how strong they are might be combined with structural information of the environment to better predict whether a cancer will invade and metastasize.

Over the long term, the structured environments that Dr. Schneider's lab builds could be used as tumormimicking environments in which to screen therapeutic drug candidates that block invasion and metastasis.

Iowa State University Department of Chemical and Biological Engineering **Primary Research Areas**



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CBiRC is awarded maximum funding by NSF; influence of center set to continue

This story was originally published with the Iowa State News Service. The National Science Foundation (NSF) has added three years and \$8.48 million to the grant supporting the NSF Engineering Research Center for Biorenewable Chemicals based at Iowa State University.

That brings NSF's total funding of the center to the maximum allowed: 10 years and \$35.26 million. NSF support of the center began in September 2008 and will end in August 2018. After that, the center must be self-supporting.

Basil Nikolau, the center's deputy director and Iowa State's Frances M. Craig Professor of Biochemistry, Biophysics and Molecular Biology, said the center was built on a vision of biologists and

biochemists working with engineers to solve common problems. The joint efforts have



opened up new catalysts and technologies for the production of biorenewable chemicals.

newables Complex.

CBiRC is housed in the university's Biore-

That has helped CBiRC quickly establish a legacy of innovation in research, technology-led entrepreneurship and education, said Brent Shanks, the center's director and an Iowa State Anson Marston Distinguished Professor in Engineering. The center's highlights (so far), according to Shanks and Nikolau include Center researchers have expanded their approach to biorenewable chemicals. Instead of only finding biological sources for the same petroleum-based molecules used by the chemical industry, Shanks said researchers are starting to produce new molecules

CBE professor Dr. Brent Shanks, Director of CBiRC.

"To me, the most powerful part of CBiRC is we've opened up new molecules for biorenewable chemicals," Shanks said. "We think this is the future."

Chemical and biological researchers affiliated with the center are doing fundamental studies in three general areas of biology and chemistry: biocatalysts, microbial metabolic engineering and chemical catalysts. In an effort to systematically bring together the researchers and technologies in those fields, the center has created three testbeds. Shanks likened the test beds to the multidisciplinary project teams that chemical companies set up for their research and development work.

"We're bringing people together who don't normally work together. We're becoming more technology-driven, not discipline-driven. We're forming new teams and seeing new synergies," he said.

The center has spun off six startup companies over the last three years. More are expected. Peter Keeling, the center's director of industrial collaboration and innovation, said a major reason for that success is the center's science. He said bringing together biologists and chemists to create biorenewable chemicals has been a powerful combination. And a challenging one: "All the larger chemical companies find it hard to manage biology and chemistry. These technologies have been separated for many years. Also, the biology takes longer to perfect, but it's valuable because it does things chemistry can't do." Another reason for the success spinning off companies is the center's BioBased Foundry, which combines a class in technology-led entrepreneurship with mentoring by faculty members and industry leaders. The foundry is targeted at graduate students and postdoctoral researchers because that can be a good stage in a scientist's career to explore launching a company.



Benjamin Clark, a Boone High School student, is shown in a Biorenewables Complex lab. He took part in the 2015 Young Engineers and Scientists program coordinated by CBiRC.

The center has established education programs for students in middle and high schools, for school teachers, for college undergraduate and graduate students. One program, for example, places Iowa State graduate students in Des Moines middle and high school science, technology, engineering and math classrooms. A Research Experiences for Teachers summer program brings high school teachers to center labs. There's also a summer academy for middle school teachers and workshops for elementary teachers. Through these efforts led by Adah Leshem, the director of CBiRC's pre-college education programs, the center has reached more

than 20,000 pre-college students and 200 of their teachers.

The center is also home to a Research Experience for Undergraduates program. Over its seven years, the 10-week summer program has brought nearly 100 undergraduates from around the country to Iowa State research labs. Nearly half of those students move on to graduate or professional schools.

Ask Shanks about the center's progress and the word "legacy" keeps coming up. There's the chemistry and biology coming together. The technologies de-risked for commercialization. The school students getting to know center researchers. The graduate students learning how to launch a company that meets customer needs. The industry partners sending representatives to Iowa for the first time ever. The programs spilling over to include the broader university. The papers contributing to the technical literature.

"Part of our legacy will be to see where the center's science and engineering fits within the bigger picture," Shanks said. "We've brought a new way to look at the challenges of biorenewable chemicals."

Four finish terms on CBE Advisory Council

Mary Jane Hagenson, Robert (Bob) Lane, Leigh Thompson and Dennis Vaughn have finished their terms on the Department of Chemical and Biological Engineering Advisory Council. All four are alumni of Iowa State.



Hagenson served as the chair of the group and remains as a governor of the Iowa State University Foundation. Lane, also an ISU chemical engineering graduate, enjoyed a 30-year career with Shell Companies (more information about Hagenson and Lane is available on page 10).

Thompson



Thompson (B.S. ChE '93, PhD ChE '97) is a senior technology scout for Ventures and Business Development with Dow Chemical Company. She also has a background in campus recruiting for Dow.

Vaughn (B.S. ChE '70) retired from General Mills in 2008 as Corporate Director, International Environment, Health & Safety and Global Safety.

Both completed two three-year terms. CBE extends its gratitude to all four individuals for their valuable service on the Advisory Council, which is composed of industry professionals who lend their expertise in departmental planning.



Department chair Andy Hiller (center) joins Bob Lane and Mary Jane Hagenson in Sweeney Hall ceremonies honoring both for their service on the CBE Advisory Council. The two also received College of Engineering awards that day in a separate ceremony.

Sweeney Hall improvements undertaken in 2015



New research and computing lab space in Sweeney made possible by Baxter generosity

The space formerly occupied by Sweeney Hall rooms 1145/1153 is being converted into modern laboratory space that will be used by CBE students and faculty through the support of Reginald R. and Jameson A. Baxter.

The addition of computing and collaborative lab space in 0104/0108 Sweeney, opened in 2014, was made possible by Baxter support as well. Work on 1145/1153 will continue through late 2015, with an official opening date to be determined. The continued support provides valuable assistance to students in their CBE studies.





2114 Sweeney: The department's main office received a major makeover, with reassignment of space and additional work space added in the form of cubicles and two new enclosed offices. This helps free other office space in the building which will become occupied by graduate students or faculty members in the future.





New electronic device charaing stations in Sweeney Hall have made it easier for students to stay connected. The "Cyclone Power"stations (top photo) are a project undertaken by the College of Engineering and placed in all engineering buildings. The bottom photo shows one of two new table-style charging stations with multiple outlets placed by CBE in the Sweeney Hall lobby.



Gerwig computer lab continues to expand with addition of new audiovisual technology

The computer teaching lab on the first floor of Sweeney Hall, made possible by the generosity of Robert & Jeanne Gerwig, has seen the addition of cameras, microphones and other equipment to allow two-way live streaming of classroom activities and enhanced learning opportunities for students



2058 Sweeney: The open center bay in Reginald R. & Jameson A. Baxter Computthis formerly bi-level lab was filled with ing and Collaboration Lab: This student reinforced concrete to create a solid study and meeting facility in Sweeney Hall floor on the second level. This provides saw the walls enhanced by the placement an addition of approximately 1,000 sq. ft. of framed photographs featuring lowa of space which will be used as a shared State University campus scenes. research and teaching lab space.



New staff members join Chemical and Biological Engineering during 2015

CBE welcomes new individuals to the department, ready to serve faculty, students and more



Ashley Augspurger

Ashley has joined the staff as Laboratory Coordinator. She received a B.A. in chemistry from Grand View University in 2010 and a Ph.D. in analytical chemistry from Iowa State in May, 2015. Her Ph.D. research involved imaging single nanoparticles for biosensing and cellular imaging as well as optical microscopy in undergraduate chemical education.

Tonia Baxter



Tonia joined the Department of Chemical and Biological Engineering in 2015 as an academic adviser. She came to Iowa State from the University Center of Lake County in Grayslake, IL (an extension campus) where she served as an adviser, working with 20 member universities.

Prior to that she was an adviser in Minneapolis, MN, first for the University of Minnesota in the College of Liberal Arts (where she worked

with science programs); and with Metropolitan State University in the Department of Information and Computer Sciences.



Janessa Boley

Janessa is the newest academic adviser to join the Department of Chemical and Biological Engineering. She comes to Iowa State from Central College, where she worked in admissions.

She received a bachelor's degree in biology from the University of Northern Iowa before obtaining a master's in secondary education/student affairs from UNI. She said Iowa State was an institution that she

had her eye on, and, "My family is all Cyclone fans, so they are very happy that I'm now going to be a Cyclone!



Adam Dane

Adam comes to CBE as an academic adviser. He spent two years working with the Office of Student Financial Aid while obtaining a master's degree in student affairs from ISU. He holds a bachelor's degree in sociology from Luther College. "When I was in the second year of my master's program and was exploring jobs and locations, advising was definitely an area I was interested in," he said. "And with financial aid, I enjoyed working with students to help provide opportunities to them in

very important aspects of their lives." Dane says Iowa State was one of the major institutions he was most interested in, and having been a student and employee here already, the transition to the new position has been smooth. Originally from Bettendorf, Dane now lives in Des Moines with his girlfriend, who is employed by John Deere

Chris Gerke



Chris Gerke joins CBE as fiscal coordinator. She previously worked in the Iowa State University Controller's Department, working in payroll and accounting. Prior to that she worked for the Grand View University College Campus Church as bookkeeper. She is an Iowa State alum, with a degree in Finance. Chris lives in Johnston. She is married and has three daughters. Her husband and one daughter are graduates of Iowa State.

Kim Ohge



Kim Ohge joined the staff of CBE as a secretary based in the Mike & Jean Steffenson Student Services Center, and has also assisted with many other office functions.

Kim is a longtime Iowa State employee, having most recently worked in the New Student Programs office for ten years. Prior to that she worked as

a service center clerk in the Department of Residence and also as a staff member at Iowa State's Thielen Student Health Center.

Colin Richey



Colin is the department's new Systems Support Specialist. Prior to joining the CBE staff he worked in systems support for Ames National Corporation. He holds a B.S. in Finance from Iowa State.

Colin was born and raised in Ames, and resides there with his wife and two young sons. He's a general sports fan, but especially loves soccer and

American football, and can be found in the stands at Jack Trice Stadium for all ISU football games. He has also served as a soccer coach for his oldest son's team.

Michelle Stotts



An Iowa State employee since 1990, Stotts brings a wealth of prior management experience at the university to her new position with CBE as operations manager. She was most recently the associate director of the ISU Alumni Association, where she worked closely with the association's president and oversaw many functions, including human resource activities, strategic planning initiatives, program areas, and overseeing staff.

Prior to working with the Alumni Association she served in the role of program coordinator for the university's Information Technology Services, overseeing the department's human resources. Before that she held various management-level roles with the university's Administrative Data Processing (ADP) Center.

GRADUATE STUDENTS

We honor our Fall '15 graduate students who received fellowships, and extend a thank you to supporting alumni!

Edward W. and Joyce C. **Backhaus Scholarship**



Sujata Senapati

Loren and Donna Luppes Frederick Martinson Chemical **Graduate Fellowship**



Alireza Saraeian

Presidential Scholars Fellowship



Benjamin Schlichtmann



Reginald & Jameson

Baxter Fellowship

Anuraag Boddupalli

Engineering Scholarship



Yujie Wang

Lanny A. Robbins Endowed **Graduate Fellowship**



Fatima Enam

Reginald & Jameson Baxter Fellowship



Yuerui Huang

Mir Hossen Frederick Martinson Chemical George W. Parrott Centennial

Engineering Scholarship



Shuting Yan

Lanny A. Robbins Endowed **Graduate Fellowship**



Atefe Hadi



Cheng Peng

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James Katzer Energy M.A. Larson Fellowship in Chemical Engineering



Sungbum Hong

George W. Parrott Centennial Graduate Fellowship



Russell Mahmood

Sweeney Family Memorial Fellowship



Samuel Rothstein

Inaugural CBE Showcase provides valuable insight for Iowa State students







Poster presentations, tech talks, faculty presentations, information about student organizations and more were on the menu in the inaugural CBE Showcase, held throughout the first floor of Sweeney Hall. The event was organized by student groups AIChE, CEGSO, NOBBChE and OXE.

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Susanna Kuuttila

Sweeney Family

Graduate Fellowship

Fellowship

Stanford's Khosla is 2015 Doraiswamy Lecturer in CBE

Diseases of the world may have a tougher time proliferating in the future thanks to the work of scientists like Dr. Chaitan Khosla, professor in the Department of Chemistry and Chemi-



memorative plaque at his Iowa State L.K. Doraiswamy

cal Engineering at Stanford University, and a member of the National Academy of Engineering. He spoke to faculty, staff and students of Iowa State University with a presentation entitled "Assembly Line Biosynthesis of Polyketide Antibiotics," as part of the Department of Chemical and Biological Engineering's L.K. Doraiswamy Honor Lectureship Series, named in honor of a former Iowa State chemical engineering faculty member.

Khosla discussed ongoing and evolving research in the "assembly line" functions of enzymes in polyketides - chemical compounds with antibacterial, immunosuppressant and anticancer activity. The work has an impact on

medications such as antibiotics. Scientists may be able to engineer new antibiotics using this knowledge; an important function, given the recent emergence of drug-resistant pathogens.

Khosla reported the study of this topic began in 1994, with one assembly line known to researchers. Today, close to 1,000 assembly lines are known. Khosla said understanding of the structures and mechanisms involved in the processes offers a challenging and exciting opportunity for researchers as the world heads further into the 21st century.

Each year one internationally renowned scientist or engineer is selected to provide the L. K. Doraiswamy Honor Lectureship in Chemical Engineering. This individual presents a lecture at Iowa State University and the National Chemical Laboratory in Pune, India, the home of L.K. Doraiswamy, a former Anson Marston Distinguished Professor in the Iowa State University chemical engineering program (1989-2001) and director of India's National Chemical Laboratory (1978-89). Doraiswamy was a global leader in chemical reaction engineering, having written six highly acclaimed textbooks and published over 170 articles. He received many top awards and honors, including election to the National Academy of Engineering in 2010 and the Padma Bhushan - the Republic Day Award of the government of India, in 1990. Doraiswamy died in 2012 at age 85.

Khosla pointed out that coincidentally, he also hails from Pune, India, the home of Doraiswamy, and was a classmate of Doraiswamy's son, Deepak, who is also involved in the chemical engineering field.

CBE graduates return, representing employers at Engineering Career Fair





CBE alums at the Fall 2015 Engineering Career Fair included (top row, L-R): Mike Wald, Blake Sorenson, 3M; Eric Neimeyer, Ashley Leitner, Justin Glasper, John King, ChevronPhillips Chemical Company (with ISU CBE alum Mason Bieker shown on the banner). Second row: Lizette Jimenez, Cargill; Casey Frank, io-Mosaic; Sarah Woodward, Compressor Controls Corp.; Patrick Conness, Encapsys. Third row: Michael Stoeker, Syngenta; Ali Imran, Valent Biosciences Corp.; Mitchell Irlmeier, LyondellBasell; Kevin Haney, Spectro Alloys. Bottom row: Callie Kirkegaard, Ben Stover, Matthew Skoglund, The Bemis Company. Congratulations to all!

presentation.

www.CBE.iastate.edu

Soldier for biorenewables: Spring 2015 CBE grad splits time between school, serving Uncle Sam

It's was a seven-year, often interrupted college journey for Kidron Knox, who received a Bachelor of Science in chemical engineering from Iowa State in May. It wasn't easy; but then again, the education Knox received wasn't all what you'll find in a college catalog -- because in that time Knox has



ChemE grad Kidron Knox with CBE professor Dr. Jackie Shanks, one of the people he credits with my situation and worked so hard to make adhelping him through his unorthodox college journey. justments for it, and kept things from falling

also been a student in the curriculum of serving his country, as a member of the U.S. Army.

Knox, a native of Dubuque, Iowa, spent the last four years as both an Iowa State transfer student and a military man, serving in one overseas deployment and one overseas training exercise, in addition to spending time focusing on an internship at a company that ended up employing him in a management position even before his college graduation.

Many friends and a mentor

"Everyone at Iowa State totally understood through the cracks," said Knox. "When I was

on one of my military deployments one chemistry professor allowed me to take pictures of my completed homework with my phone and send the pictures to him to get credit."

Knox never lost sight of his goal: to study chemical engineering and to work in biorenewable energy. "I wanted to work with biorenewables to turn Ethanol and biodiesel plants into centers for renewable resources that we have in society," he said. His interest in this technology led him to Iowa State Chemical and Biological Engineering professor Dr. Jacqueline Shanks, who became a mentor and a valuable asset for not only his education, but an ally in helping him combine the

life of a student and the life of a soldier. "Dr. Shanks was very instrumental in helping me get through my journey at Iowa State while balancing all the other things going on in my world," he explained. Shanks admits to one period of time when she had to work hard to keep Knox from throwing in the towel, when he felt that he could not possibly be a student and a soldier at the same time. She prevailed.

Knox also has much to say about others in CBE: "The whole advising and teaching staff was great during this time. I would communicate with them by email and they would



Knox (front row, left) and members of his Amesbased Army unit show their Cyclone pride while on a rotation in S. Africa.

make sure to take care of things like seeing that my ISU email stayed connected and that I did not miss anything important." He also praised the Office of the Registrar and the university's Veterans Center and coordinator Jathan Chicoine for offering a great deal of assistance in many areas.

That university support made it easier for Knox to focus on his Army duties during deployments, where he was part of the 949th Medical Detachment based in Ames. A veterinary-related unit, Knox worked as a lab technician during his first overseas rotation in South Africa, where the group

provided veterinary care for animals; and in his second rotation in Kuwait as part of Operation Enduring Freedom, where his unit provided care for military working dogs and also ensured that

U.S. troops were receiving and eating healthy foods.

Another highlight of his military service and great source of pride for Knox was being part of the Army's Best Warrior Competition, an elite event that brings together American soldiers to vie for special honors incorporating a number of physical and tactical tasks. Knox was involved as both a competitor (where he won in two different levels of command) and as part of the Cadre, which is a support group for the competition.

Engineering Career Fair helps chart a course

But it was a trip to one of Iowa State's College of Engineering Career Fairs that cast the die for Knox's future plans. He approached The other side of Knox's college one of the participants, a company called Corn Oil ONE. After vears: He takes down an oppolearning more about the company that specializes in producing nent in the Army's Best Warrior a refined corn oil that delivers the advantages of soybean oil at competition. a fraction of the cost, he planned an internship program there.



"That Iowa State Engineering Career Fair is the best of its kind that I know of," Knox remarked. "I found my job at the Engineering Career Fair."

His involvement with Corn Oil ONE led to specific research that he conducted at Iowa State as an undergraduate - which in turn led to co-authoring one patent published in May of 2014 and two other provisional patents. The process Knox collaborated on with six other Iowa State interns and one Iowa State graduate student takes Ethanol and employs a free fatty acid removal system which then produces the attractive reconstituted corn oil. It produces healthier vegetable-based feedstock that is in demand with today's farmers. Corn Oil ONE contracts with Ethanol facilities and cur-



rently works closely with one in Council Bluffs.

Research project seals the deal

Naturally, Knox had a strong connection to the university's Center for Biorenewable Chemicals (CBiRC) and Dr. Brent Shanks, the facility's director, and husband of Jacqueline Shanks. "What he and that center are doing is having an incredible impact. Brent Shanks has really helped put a new face on ISU Chemical Engineering," he said. "It was my internship research at Iowa State that took this Ethanol and corn oil process and put it in a beaker." During his senior year at Iowa State Knox was hired by Corn Oil ONE as plant superintendent in the company's brand new facility, placing him in the position of having a full time job and a head start on a career before even leaving school.

Full circle: Knox (left) represents his employer, Feed En-

fall 2015 Engineering Career Fair. He initially approached the company at a Career Fair when he was a student.

ergy and FEC Solutions, at the Through it all, it's been a case of teamwork that Knox treasures. "I can't say enough good things about so many people at Iowa State who worked so hard to make sure I could get an education and still fulfill my duties outside of being a student."

UNDERGRADUATES

Right: A large contingent of Spring 2015 CBE graduates gathers for the "group shot" at the pre-commencement reception. Nearly 80 students graduated with Chemical Engineering degrees in May. Below: Christina Goeddel was presented with the Laurence E. Burkhart Outstanding Senior Award.







Left: CBE senior Jill Schoborg (center) was one of three chemical engineering undergraduates from around the nation who took part in the WISE (Washington Internships for Students of Engineering) from May 31 to August 1. The students prepared and delivered original research papers on public policy topics based on what they learned in their internships. Schoborg studied genetically modified organisms, documented in a paper included in a national publication.





Above: Members of Iowa State's chapter of the American Institute of Chemical Engineers (AIChE) had two teams in the "ChemE car" competition at AIChE's Mid-America Student Regional Conference in Lawrence, Kansas. The "Squirtle Squad" entry took fourth place, with "Steve" finishing fifth. Students were involved in other activities as well. Iowa State CBE students who took part in the conference included: Arianna Adams, Michelle Ampuero, Laura Appelen, Abigail Bruen, Jiong Da Low, Elizabeth Frank, Derek Gagni, David Gardner, Eve Goh, Amanda Hannash, Quinn Hanson-Pollock, Matt Hendrickson, Eric Hibner, Christopher Isely, Carolyn Jennrich, Catherine Le Denmat, Shridharshna Mailachalam, Joshua Potvin, Eli Reiser, Fengze Sun, Yee Sheian Tan, Carson Wells and Ivy Wu. They were accompanied by CBE professor Dr. Derrick Rollins.

Left: CBE undergrad scholarship recipients gather at the 2015 department awards banquet. In the 2014-15 academic year 228 undergraduate students received a total of 259 scholarships. The department extends its sincere thanks to all individuals and corporate entities whose generosity through scholarships help students reach their educational goals.

Seen in CBE....











Top row: CBE alum Dr. Lanny Robbins poses with the two recipients of his Lanny Robbins Endowed Graduate Fellowship, Fatima Enam (left) and Atefe Hadi; alums and department supporters Denny (left) and Karen Vaughn smile with chair Andy Hillier at the ISU Bio-Polymer facility dedication. Middle: A department ice cream and popcorn social helped welcome students back to campus the first week of fall semester and hosted a large turnout; Gil Baguio, who teaches science classes in a vouth correctional facility in Baltimore, MD, journeyed all the way to Ames for the annual Research Experience for Teachers program in CBE. He worked with Dr. Matthew Panthani, **Bottom:** Donor Jack Johnson, who established the inaugural Carol's Chair in memory of his wife, alum Carol Johnson, ioins recipient Dr. Surya Mallapragada (left) and Carol's sister Dianne Dennis at Dr. Mallapragada's medallion ceremony.





Above: CBE's inaugural tailgate was held in a hospitality tent outside Jack Trice Stadium prior to the Oct. 3 ISU vs. Kansas football game, organized by CBE's student chapter of AIChE. More than 130 alums, faculty members, students and other friends of the department spent time eating a catered breakfast and socializing in a very successful event. In the top photo, emeritus professor Dean Ulrichson (left) joins Dr. Jackie Shanks, ChE alum Mark Smith and his son Drew, a CBE freshman. Right, top: CBE students and grad students enjoy the department tailgate. Middle: CBE chair Andy Hillier serves walking tacos as part of a College of Engineering fundraising lunch for the annual United Way campaign. Bottom: CBE participated in a "Minute To Win It" game night for United Way with a game that involved knocking soda cans off a table by shooting rubber bands. Many participants tried their luck in support of a good cause.











Above: Participants in the 2015 Oviedo, Spain CBE Summer Lab Program enjoy some leisure time in front of a local cathedral with adviser Dr. Stephanie Loveland (top photo) and at a dining attraction. The popular and challenging "hands-on" program allows CBE students to spend five weeks working with faculty at the University of Oviedo in northern Spain for class credit.









With a donation of cinnamon sticks from Tone's, CBE seniors Mitch Berns, Parker Hoye, Jake Larson and Zach Stahl conducted an experiment in distillation for a class assignment in CH E 426. A big thank you to Tone's for their support of ISU CBE!.

Left: Members of the ISU student chapter of AIChE (American Institute of Chemical Engineers) gather at the Des Moines Airport prior to departing to the AIChE Annual Meeting in Salt Lake City. Members attended meetings, participated in a poster presentation contest, delivered speeches and networked with fellow students, educators and business professionals.

Help keep CBE strong!





Your contributions help the Department of Chemical and Biological Engineering provide quality education for undergraduate and graduate students. Increasing enrollment makes the need for the best in personnel, facilities and equipment even more important.

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Thank you!

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