



Swalm School Hires New Director

The search for a new director culminated in the hiring of **Dr. Jason M. Keith**. Before coming to Mississippi State University, Dr. Keith was Professor of Chemical Engineering at Michigan Technological University at Houghton, MI. He received his B.S. in ChE from the University of Akron in 1995 and his Ph.D. from the University of Notre Dame in 2001. We welcome Dr. Keith, his wife, Salvadora, and their 3 children, Andrew (age 8), Maria (age 5), and Isabel (age 3) to Starkville and Mississippi State University.

ChE and MSU Loses Great Friend and Supporter

Hunter W. Henry Jr.

1928-2011

ChE alumnus, supporter, and great friend, **Hunter W. Henry** passed away on June 4, 2011. Hunter was “True Maroon” and was a great supporter of Chemical Engineering faculty and students alike. He was a major donor that supported the Hunter Henry Chair in Chemical Engineering, Henry Scholars in Chemical Engineering, the AIChE Student Chapter, the Hunter Henry Seminar Series, and the Atly and Bette Jefcoat AIChE Senior Leadership Award. He is remembered fondly by all and the following was written by Katherine Taconi (B.S. and Ph.D. in CHE at MSU) who was a Henry Scholar during her undergraduate tenure :

“Words can’t express the gratitude, admiration, and affection I feel for Mr. Hunter Henry. His generosity extended way beyond the scholarships that he funded. He held a genuine interest in all of his students, and this continued well beyond just the years we were on campus. He believed in me, never hesitated to tell me that he was proud of my accomplishments, and gave me the confidence to believe in myself. His presence in my life was priceless, and I will always treasure my friendship with him and many happy memories of his visits to campus. I would like to extend my deepest condolences to the Henry family. Mr. Henry is deeply missed and will certainly be lovingly remembered by those of us privileged enough to have him as part of our lives.”



Senior Convocation and Awards Recognition

This year’s Senior Convocation was held in the Eastman Auditorium on Friday, April 29 at 3:00 pm. Each year ChE holds a convocation in May to recognize graduating seniors for the Spring, Summer and Fall semesters and to present awards won for outstanding plant design presentations and the Jefcoat and Lightsey Leadership Awards. Plant Design Awards went to the following: First Place was awarded to the project submitted by Kyle Fairley, Adam Farmer, and Drew Fielder; Second Place was awarded to Derek Needham, Justin Williamson, and James Wright; Third Place was awarded to Ruthe Franke, Jerry Smith, and Rosemary Weathersby. The Jefcoat and Lightsey Leadership Awards were combined and given to Betsy Barber, Erin Casey, and Ruthe Franke.



Faculty Selected for Leadership Program

Dr. Rafael Hernandez (pictured at far left) and **Dr. Keisha Walters** (pictured at left) have been selected as participants in the 2011-12 David Carlisle Hull Faculty Leadership Program sponsored by the Office of Research and Economic Development. They are joining 13 participants from across the University who will meet monthly in a program that fosters leadership skills in promising faculty.

NSF Award Fosters Development of Nanotechnology Certificate

The National Science Foundation (NSF) has awarded a team of faculty led by **Dr. Priscilla Hill** (pictured below) a grant to develop a nanotechnology certificate program at Mississippi State University. This interdisciplinary, multi-departmental educational program emphasizes student learning of nanotechnology by developing a new set of nanotechnology courses. As part of the program, an introductory seminar course **NanoExposed!** was developed and co-taught by faculty from biological sciences, chemical engineering, electrical engineering, and mechanical engineering. Additionally a new course in chemical applications in nanotechnology is being offered during the Spring 2012 semester. This certificate program fills a critical need for undergraduates in science and engineering at MSU and in the region.



ChE Student Projects Recognized by National AIChE

Two teams of MSU-CHE students have been recognized by AIChE for their performance in the national student design contest. The contest problem is completed as part of the plant design class. First Place was awarded to the team comprised of Justin Williamson, Derek Needham, and James Wright. The Third Place Award went to the team of Erin Casey, Rebecca Atkinson, and Andrew Estess.

CONGRATULATIONS!

Accreditation Visit Concluded

The Accreditation Board for Engineering and Technology (ABET) recently concluded a scheduled site visit to the James Worth Bagley College of Engineering. Evaluations are conducted on a periodic basis on adherence to national engineering educational standards and practices. Preliminary feedback indicates that ChE performed well and a final "report card" will be issued in the summer of 2012.

Advanced Degrees Granted in 2011

The following graduate degrees were granted:

M.S. Jen Liu (Dr. Bill Elmore)
M.S. Qiang Yan (Dr. Hossein Toghiani)
Ph.D. Prashant Daggolu (Dr. Mark White)
Ph.D. Devkant Gandhi (Dr. Priscilla Hill)
Ph.D. Gang Huang (Dr. Rebecca Toghiani)
Ph.D. Sasan Nouranian (Dr. Hossein Toghiani)
Ph.D. Sheena Reeves (Dr. Priscilla Hill)
Ph.D. Emmanuel Revellame (Dr. Rafael Hernandez)

2011 American Oil Chemists Award

Emmanuel Revellame was selected for the 2011 American Oil Chemists Society Industrial Oil Products Division Student Award in April 2011. For his Presentation "Lipid Storage Compounds in Raw and Enhanced Activated Sludges," he won a certificate and \$500 grant to attend the conference.



2011 MSU Biofuels Conference

The 2011 MSU Biofuels Conference welcomed more than 200 attendees, speakers, and special guest **Secretary of the Navy Ray Mabus** to Mississippi State University (MSU) in October. The theme of the conference, “Research to Commercialization,” highlighted the relationship between researchers and industry professionals seeking to better Mississippi and the United States with efficient biofuels resources. Thursday, October 6 began with a keynote address from Secretary of the Navy Ray Mabus followed by speeches from researchers and industry professionals and ended with a student poster competition.

Friday, October 7 featured more speeches and a discussion panel. Guests were also invited to take tours of the new Sustainable Energy Research Center (SERC) pilot scale facility where biocrude and bio-oil research thrusts are expanding their testing from bench scale to pilot scale.



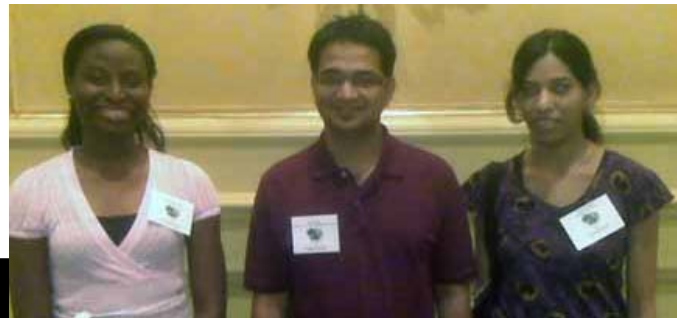
According to **Rafael Hernandez** (pictured above right), conference director and associate director of SERC, the conference has become very important to the region, and MSU is emerging as a recognized leader in biofuels research in the Southeast. With support from conference sponsors and Mississippi State University, the MSU Biofuels Conference will continue to provide the latest information on biofuels research and commercialization. (provided by Ann Hamilton McGuire, Technical Writer for MSU's Energy Institute)

MSU Students Participate in 2011 Air and Waste Management Association: Environmental Challenge International

A group of 5 MSU graduate students participated in this year's competition, **A 2025 Federal Renewable Portfolio**. The team which placed 4th and won \$2,000 was comprised of **3 ChEs, Adebola Coker, Lader Lerma, and Emmanuel Revellame** and 2 ISEs (Industrial and Systems Engineering), Mohammad Marufuzzaman and Selvarani Radhakrishnan. The title of their proposal was *Green Systems: Gearing to a Renewable and Efficient Energy Network System*.

ChE Grad Student wins Poster Competition

Adebola Coker (pictured on left below), ChE Ph.D. candidate, won 1st Place at the 10th Annual Southern BioProducts and Renewable Energy Conference Student Poster Competition in May 2011.



Drs. Rafael Hernandez and Todd French are principal investigators on the project, *Production of Sewage Derived Biofuels Applying Novel Biomolecular, Harvesting, and Conversion Techniques*. This \$600K project was awarded by General Atomics in April 2011.

Hernandez – Invited Participation

Dr. Rafael Hernandez has been invited to serve as an Editorial Board Member of *Current Opinion in Chemical Engineering*. He has also been invited as a participant to the *Commercial Aviation Alternative Fuels Initiative General Meeting* in Washington, D.C. to be held November 30 – December 1.



New Faculty in ChE for Spring 2012

Dr. Santanu Kundu received his B.E. degree from Jadavpur University, India and his Ph.D. degree from Clemson University, both degrees in Chemical Engineering. Before joining Mississippi State, he was a Postdoctoral Research Associate at the Polymers Division of National Institute of Standards and Technology (NIST) and at the Polymer Science and Engineering Department of the University of Massachusetts-Amherst.

Dr. Kundu's research interest is in the area of *soft materials*. He is interested in investigating the *processing-structure-property* relationships for various polymeric materials, particularly those of biological origin. He will study how these polymers form in various microorganisms, interact with complex interfaces, deform under stress, and can be processed into useful products. Dr. Kundu's teaching interests are transport phenomena, polymer science, and soft materials. He will be teaching advanced transport phenomena in the spring semester. He believes that teaching is not limited to the classroom and it involves formal and informal discussions with the students outside the classroom.

Dr. Kundu is married to Queene Choudhury, who grew up in Chile, works at UN-Women and is pursuing her graduate degree in International Education from Columbia University. Both Ms. Choudhury and Dr. Kundu like to travel and have travelled all over the United States. They are taking a long road trip from Bethesda (MD) to Starkville to experience the cultural changes (if any) along the way.

Instructional Modules in Development

The final year of a three year grant focused on incorporating process intensification concepts into undergraduate chemical engineering courses got off to a great start when Dr. Kishori Desphande, Senior Research Engineer with The Dow Chemical Company visited the department and gave a seminar entitled "Achieving Sustainability through Process Intensification: An industrial perspective." The grant is funded by the National Science Foundation Division of Undergraduate Education through the Course, Curriculum and Laboratory Improvement (CCLI) program. Drs. **Rebecca Toghiani** (shown at right), Keisha Walters, Priscilla Hill, Carlen Hennington (Counseling and Educational Psychology), and Adrienne Minerick (now at Michigan Tech) are collaborators on the project. Instructional modules focused on key process intensification concepts are being developed for incorporation into 4 undergraduate chemical engineering courses: Fluid Flow Operations, Heat Transfer Operations, Mass Transfer Operations and Chemical Reactor Design.



11 Years as Outstanding Student Chapter!

The MSU AICHE Student Chapter received national recognition as an Outstanding Student Chapter for the eleventh consecutive year. This award is given to only 10% of the approximately 160 active chapters across the U.S. *Congratulations to the students and advisor, Dr. Bill Elmore.*

CHE Senior Receives ExxonMobil Technical Scholarship

CHE Senior Vicdaly Williams is the 2011 recipient of the ExxonMobil Technical Scholarship – a \$5,000 award. The scholarship is awarded to underrepresented minority technical scholars. Nominees must have completed a successful internship or co-op assignment, received a return offer of employment, and maintained a 3.2 GPA.





2011 Co-op Student of the Year

Mary Ann Murdoch is the 2011 Cooperative Education Student of the Year for the Bagley College of Engineering and Science. A top senior, academically, Mary Ann has maintained an intense focus, achieving a full co-op rotation (3 terms) with Ergon and still graduating within 4 years. She is very active in extracurricular activities, including serving as a Vice President of AIChE.

Walters Research Group – Active from Undergrads to Post-docs



Dr. Keisha Walters (pictured below at left) and her group gave 16 presentations at regional and national meetings. Dr. Walters advises a team of 6 graduate students, 1 postdoctoral associate, and as many as 9 undergraduate students in laboratory research and this group has

numerous projects ongoing that provide data and information for conference presentations. Project titles include *Surface Modifications and Transport Properties of Nanoparticles*, *Computational Dynamics Simulations of Nanoparticle Lung Flows*, *Preparation and Characterization of Artificial Mucus and Diffusion Studies of Biologically Relevant Materials*, and *Reactor Design and Post-Filtration Methods to Reduce Chemical and Physical Aging in Pyrolysis Oils*.



Congratulations to the Walters Family on the birth of Jacob, shown above with sisters Audrey (left) and Caroline (right).

Undergrad Activities and Awards

* AIChE members Scott Adkins, Chris Riley, Leon Carruba, Caleb Zumbro, John Johnson, and Philip Polk participated in the presentation of the 3 research posters at the 2011 Biofuels Conference in October.

* Diedre Brockwell, AIChE Student Chapter Communications Coordinator, received the AIChE Outstanding Freshman Award for 2011.

* Chase Hacker has received the 2011 AIChE Sophomore Academic Excellence Award.

Research in Fuel Cells and Batteries

Dr. Hossein Toghiani

(pictured at right) is currently conducting research in the areas of graphene production and anchoring nanoparticles onto



graphene sheets for lithium ion battery applications, experimental performance evaluation/validation of methanol fuel cells and solid oxide fuel cells with Michael Brabend of Ultralife Batteries, Inc. on vapor grown carbon fiber nanocomposites, carbon-based nanomaterials and catalytic upgrading of pyrolysis vapors. Dr. Toghiani has also been involved with the *Challenge X project* and, more recently, with the control of emissions for the *MSU EcoCar*.

Awards for CHE Grad Students

Erick Vasquez, Ph.D. candidate, received the 1st place poster award in the BioSim Focus Area of the 2011 NSF MS-EPSCoR Meeting, the Outstanding Researcher Award at the MSU Graduate Student Symposium, and was selected as a MS student representative at the National EPSCoR Conference in October in Coeur d'Alene, ID.

Ersan Eyiler, Ph.D. candidate, received a Travel Award supporting travel to present at the 2011 Society of Plastics Engineers Annual Technical Conference in Boston, MA.

Waste Processing in Support of Hanford and Savannah River Sites

Dr. Rebecca Toghiani continues her efforts in improving predictions of waste chemistry and development of innovative process treatment schemes in support of legacy nuclear waste remediation waste processing and modeling of operations at the Hanford and Savannah River Sites. The Institute for Clean Energy Technology (ICET) Team, comprised of Drs. Jeff Lindner, Laura Smith, Larry Pearson, and John Luthe, has been working in these areas since 1997. In past years, they developed a database for the Environmental Simulation Program (ESP) that captures the chemistry relevant to high ionic strength conditions present in the tanks and allows predictive computations to identify retrieval and sequencing strategies for remediation of the legacy waste. Efforts this year have focused on measurement of aluminum solubility in aqueous solutions of caustic, sodium nitrate, sodium nitrite and sodium carbonate as a function of temperature. During the coming year, these measurements will be expanded to include the effect of sodium phosphate and sodium sulfate. Once integrated in the ESP software, these data will allow reliable predictions of solution compositions.

Dr. Hossein Toghiani Leads Materials Research

Dr. Hossein Toghiani had 3 graduate students who completed degree requirements under his direction this year. Topics included *Vapor-Grown Carbon Nanofiber/Vinyl Ester Nanocomposites: Designed Experimental Study of Mechanical Properties and Molecular Dynamics Simulations, Synthesis, Characterization and Catalytic Studies of Carbon-Based Nanomaterials; and In-situ Catalytic Upgrading of Pyrolysis Vapors.*



More Student News

The AIChE student chapter conducts many K-12 outreach activities. The chapter teamed with a local Boy Scout troop to deliver a series of half-day LEGO robotics workshops to middle school students from local schools, allowing one Scout to complete his Eagle Project in robotics.



Each Spring, Dr. Bricka's capstone Plant Design class presents their design problems in a competitive poster format judged by external industry representatives and other faculty within the School of Chemical Engineering. *(see photo at left)* Projects from top teams completing the AIChE national design problem are submitted to the national competition. Winners were announced on page 1 of this newsletter.



The MSU AIChE student chapter hosted an annual Spring event – this year the 1st Annual Bull Barn Bash (located at the old MSU Bull Barn near the north farm). Nearly 200 pounds of crawfish and countless burgers/brats were on the menu as the School of Chemical Engineering closed out the 2011 Spring semester in style. *(see photo at left)*



John Harden

I'm a 2002 (B.S.) and 2006 (Ph.D.) graduate of the Swalm School of Chemical Engineering. I continue to live in Magnolia, Arkansas with my wife, Grace. We were richly blessed this year to welcome our firstborn child into the world when our daughter Ella arrived on October 27, 2011. I continue to work for Albemarle Corporation and am based at our plant in Magnolia. I completed a successful overseas expansion project assignment earlier this year at Albemarle's joint venture site on the Dead Sea in Safi, Jordan. It was a great experience working several weeks overseas, meeting new friends, learning new processes, working in a foreign manufacturing plant, and seeing new sites. I got to take in several

historic sites while I was there including Petra, Jerash, Amman, and Jesus' baptism site at the Jordan River. If you ever get a chance to float in the Dead Sea, I highly recommend you try that out. It's pretty wild. I also received a promotion to Process Technology Specialist in the Spring of 2011.

Robert Green (B.S. 1982, M.S. 1984) was elected as Vice-President of the National Society of Professional Engineers (NSPE) in July. He will be President-Elect next year and President in 2013-14. He will then serve as Immediate Past President the following year. Robert is the Undergraduate Affairs Coordinator for the James Worth Bagley College of Engineering at MSU.



Wes Enders

After graduating from MSU in 1981, I worked 10 years as an engineer for the Atlantic Richfield Corporation, before going back to law school at the University of Virginia. I now practice patent law in Austin, Texas in partnership with three other attorneys. I have been married to my wife (Maggie) for 30 years, and we have three children who are either working or attending school here in Austin. My interests include boating and wakesurfing, riding dirt bikes, and hunting. I usually make several trips back to Mississippi every year, either to visit our family farm near Batesville or to go duck hunting.

Jacob Palmer

(B.S. in 2002) I am still at The Dow Chemical Company in Plaquemine, LA, but I recently accepted a new job with them in Chicago! I will be moving to the Chicago area in February to be the Responsible Care Leader for the 7-site Chicago Hub that includes plants in Wilmington, Joliet, Kankakee, Elk Grove Village, Ringwood, Chicago, & Charleston. The rest of the news for me is similar to what I sent you for the last E-Newsletter. I'm still married with no kids. My wife and I enjoy traveling as much as possible and in the past year we've been to Egypt, Colombia, Costa Rica, and all over the US.



Richard Harrell

Richard Harrell (shown on left with Phil Bryant, Governor-Elect of MS) is a 1992 graduate and was recently appointed as Head of the Office of Pollution Control of the Mississippi Department of Environmental Quality (MDEQ). He has held a variety of positions at MDEQ since joining MDEQ in 1993. From a recent MDEQ release: "It's been a privilege to have a career in the public sector working both for the citizens of our state and the environment. Protecting our state's natural resources is not only a job for me, it's an opportunity to do what I can to protect and enhance the environment I enjoy with my family."

Kenny McMillon

Kenny (B.S. in 2003) is currently working as a Technical Consultant with Omnova Solutions, Inc. He is based out of Columbus, MS, when he is in the US but travels frequently to Shanghai, China and Rayong, Thailand. Permanent residence for Kenny and his wife is in Daphne, AL

Chandra Kothapalli

Dr. Kothapalli (M.S. in 2003) recently accepted a tenure-track faculty position in the Department of Chemical and Biomedical Engineering at Cleveland State University in Ohio. He is setting up his research lab and teaching a graduate course on Biomaterials this fall.

ALUMNI NEWS

Alfred Perkins



After graduating from MSU, I attended law school at the University of Alabama. For the last 14 years, I have been a practicing attorney in Birmingham, AL. I am a partner in the law firm of Starnes Davis Florie, LLP, where my practice consists of defending civil litigation in the areas of product liability, labor and employment, and

governmental torts. My ChE degree has been particularly helpful in my product liability cases. My wife Kerensa (also an MSU grad) and I have 2 children, Daryl (11) and Abeni (7)



Ron Pitman

Ron (B.S. in 1998) is currently working for Valero at the Houston Refinery as the 2012 FCC/Alky/GDU Turnaround Technical Lead. Previously he was the Technical Services Manager for the Refinery for 2.5 years. His wife Paige is a Clinical Assistant Professor with the University of Houston College of Pharmacy and is the Director of Institutional Based Advance Pharmacy Practice Experiences. Their 3 children are Grayson in 2nd grade, Cara in Kindergarten and Sadie in Pre-K.



ALUMNI NEWS

Pauline Ash Ray

Tallahassee resident Pauline Ash Ray (B.S. in 1970), who serves as an Assistant Professor of Business at Thomas University, recently received her Ph.D. in Business Administration at Trident University International. She has been a member of the faculty at Thomas University since 2003. In addition to her B.S. in ChE from MSU, she holds a bachelor's degree in Accounting, a master's degree in Business, both from Mississippi University for Women, and a master's certificate in Accounting from Brenau University. She now spends time with family in Thomasville, GA and Tallahassee where she lives with her husband, Rickey Ray, as location is no obstacle. She teaches all of her classes online!



James Wright

James Wright (B.S. in Dec 2011) is spending his final semester enjoying a study abroad experience in New Zealand. He landed in Auckland, New Zealand on July 6, and immediately participated in a 10-day cultural adjustment program. School classes are quite different -grading consists of a midterm exam and a final exam -finals are worth a minimum 50% of the final average. He spent a two-week spring break traveling to the South Island of New Zealand. He has also been on expeditions up the Fox Glacier and the Franz Joseph Glacier. He has also hiked around the Fiordlands on the West Coast and went skiing for the first time at Treble Cone Ski Resort in Wanaka, New Zealand. He also spent time at the Codrona Ski Resort in Queenstown. When James returns from New Zealand and graduates in December, he will be working with Southern Ionics in West Point, MS until August then attending graduate school at Colorado School of Mines studying Materials Science.

Jerry Mitchell

Jerry who graduated in 1960 and is pictured above sent this picture of his graduating class. Some of the faces are hidden but those that can be seen clearly are (from left to right): Neil Weller, Bill Martin, James Kersh, Jerry Mitchell, J.B. Petty, and Harold Stuart. If you can identify any of the others in the photo, or ARE one of the others, please let us know!

CHE Alumni – Next year let your classmates know where you are and what you are doing. We will send out a request for info in late fall and we want you to respond!

Director's Notes

Dear Alumni and Friends of the Swalm School of Chemical Engineering –It seems like yesterday when I received a call from Mississippi State University telling me that I was nominated for the Director's position in Chemical Engineering. After some discussion with my wife, we decided that it was a great opportunity for us both professionally as well as for our family. I have enjoyed talking with our current students and alumni about their experiences and am always impressed with the passion our graduates have for Mississippi State.



Prior to joining Mississippi State, I was a faculty member for 11 years at Michigan Technological University. I had a wonderful time as a faculty member and building relationships in the community. I chose MTU for the same reasons that I have now chosen MSU – a balance between teaching and research and a family atmosphere. Although Starkville is a college town, we are still getting used to it taking more than 5 minutes to get anywhere, and are recognizing folks from our neighborhood and church while we are about town.

I am pleased to report that 2011 has been a wonderful year for us in chemical engineering. We continue to strive to maintain excellence in our undergraduate program. Our recent enrollment is approximately 275 students with a significant number of female and minority students. Our freshmen continue to excel prior to joining us, with an entering ACT score of 28.4. Our students have benefitted strongly from departmental level scholarships as well as additional opportunities through the university, college, and corporations. The student chapter of AIChE has a large level of active participation and this year won their 11th consecutive Outstanding Student Chapter Award. About 2/3 of our graduates (39 in May 2010 including 11 female and 2 minority graduates) have co-operative education experience, and our department's emphasis on practical learning helps them hit the ground running whether it is in industry or in graduate school.

Our research and graduate program is also doing well. In the most recent reporting period, we had \$6.1 MM of research expenditures, of which \$5.2 MM were from federal sources. As noted elsewhere in this report, several of our graduate students completed their degrees this year. We currently have 11 MS and 16 PhD students and are looking at growing the number of full time students in our program while maintaining a high level of one-on-one interactions with our faculty and preserving student quality.

Please feel free to contact me at 662-325-2480 or by email at keith@che.msstate.edu. All in all, it has been a great first semester at the university and I look forward to many more!

Dr. Mark Bricka Receives Southeastern Sun Grant



Dr. Bricka (pictured above at right) recently received a 2-year grant of \$180,969 from the Southeastern Sun Grant Center for the "Development and Evaluation of a Cost Effective Catalyst for the Treatment of Syngas Tars Produced from a Woody Biomass". The Southeastern Sun Grant Center is headquartered at the University of Tennessee.

French and Hernandez Wastewater Technology Licensed

An innovative technology developed by Drs. Todd French and Rafael Hernandez has been licensed for use by Canadian company, New Forest Industries. The technology, developed as a result of work funded by the Sustainable Energy Research Center (SERC), converts wastewater generated during production of wood chips into biofuels and a potential animal feed. Also originally a part of the research team at MSU was Dr. Mark Zappi, now Dean of Engineering at the University of Louisiana-Lafayette.