

# Purdue University

# Agricultural & Biological

## ENGINEERING

### Inside This Issue

ABE Visits Cameroon

ABE Faculty News

ABE Student News

ABE Visits Alaska

ABE News and Events

ABE Alumni Update

Purdue Calendar

### *ABE News!*

*The Purdue Agricultural and Biological Engineering department as been named the number one graduate program and number two undergraduate program by U.S. News and World Report. This is the highest ranking for any of the Purdue engineering programs - congrats!*

## From Department Head - Bernie Engel

Greetings! We are well into the new semester and academic year. We had a wonderful Welcome Back Picnic in early September to welcome new and returning students to ABE - more than 350 attended. We also enjoyed hosting Purdue President France Córdova and her family at our annual picnic. The picnic has certainly become an event for our students. Thank you to those of you that helped support the picnic through donations of hats, shirts, food and numerous other items. You can read more about the picnic on page 6 of this newsletter and at our web page at [www.purdue.edu/abe](http://www.purdue.edu/abe).



In the spring ABE newsletter we announced our number one graduate program ranking by US World and News Report and I am pleased to announce that we have received more outstanding recognition - we were named the number two undergraduate program by US World and News Report - congratulations to all!

In this issue we are highlighting a trip to Bangang, Cameroon, see page 2, with Professor John Lumkes and several ABE students as well as an article about Professor Bernie Tao, see page 5, and his trip to Alaska to do research on biodiesel fuel in extreme conditions. ABE faculty and students continue to do very exciting research often in far reaching places.

You can read additional highlights on our faculty, students and alumni throughout the newsletter as well as extended articles being published on our ABE web page at [www.purdue.edu/abe](http://www.purdue.edu/abe).

We have a record enrollment of students this fall with combined undergraduate and graduate enrollment of just over 400. Placement of graduating students and students in internships remains a challenge with the current economy.

Be sure and keep your information current with Micky Creech at [mcreech@purdue.edu](mailto:mcreech@purdue.edu). Micky also works with our students in identifying job and internship opportunities so please let her know of any opportunities.

Boiler Up!

*Bernie*

### **Our Mission**

**“To prepare students, citizens, and the industry for the future through innovative education and extension/outreach program, and the discovery of knowledge.”**

# ABE VISITS BANGANG, CAMEROON

Professor John Lumkes traveled with four ABE students (Austin Bello, Craig Blough, John Gibson, and Jacob Oswalt) from May 17-26 to Bangang, Cameroon to assist the African Centre for Renewable Energy and Sustainable Technology (ACREST, [www.acrest.org](http://www.acrest.org)) with developing affordable transportation for rural areas in Africa.



The goal is to continue developing a sustainable partnership with ACREST in the areas of affordable transportation, renewable fuels, sustainable agriculture and food preservation, wind and hydro energy generation using appropriate technology for local villages, and soil and water environmental projects.

During the Spring semester the students were members on a student design team advised by Dr. Lumkes. The team focused on designing and building a basic utility vehicle (BUV) for developing countries ([www.drivebuv.org](http://www.drivebuv.org)), with an emphasis on vehicle use in Cameroon. In addition to the transportation project, the Purdue group also helped with renewable energy projects including wind and water electricity generation, and pressing oil from local seeds (jatropha, castor, and avocado) for use as a renewable biofuel source for the vehicles.

The trip was a joint effort with the College of Agriculture, the College of Engineering, ACREST, the Institute for Affordable Transportation, and the Agricultural and Biological Engineering department.



During their time in Cameroon, the Purdue group repaired and improved a demonstration BUV for ACREST, sketched designs for a cross-flow hydroelectric turbine, discussed the formation and layout of a local micro-factory to produce BUVs using local parts, participated in the national day festival and a funeral celebration, ate a wide variety of local foods, met with faculty and staff at the University of Dschang, hiked to several waterfalls, and made lasting friendships with the members of ACREST.



If you or someone you know is interested in getting involved, please contact Professors John Lumkes ([lumkes@purdue.edu](mailto:lumkes@purdue.edu)), Klein Ileleji ([ileleji@purdue.edu](mailto:ileleji@purdue.edu)), or Rabi Mohtar ([mohtar@purdue.edu](mailto:mohtar@purdue.edu)) for more information. Students of all levels from engineering, agriculture, and management are welcome to participate. There are also opportunities for summer internships working on-site at ACREST.





# ABE FACULTY NEWS

**John Lumkes** received a “Superior Paper Award” and “Outstanding Reviewer” award for his paper titled “Design and Testing of a Dual-Path Front Hydrostatic Drive-By-Wire Control System for an Off-Road Vehicle” at the ASABE Annual International Convention in Reno, Nevada.

**Klein Heleji** recently spent three weeks (May 24 to June 16) at the State Key Lab for Clean Energy Utilization (CEU), Zhejiang University in Hangzhou, P.R. China. While in China, he worked with colleagues there on the logistics of biomass to power plants for electric generation. Like the U.S., China has a growing interest in utilizing biomass for biofuels and biopower production. One of the areas of focus is the production of electricity and steam in 100% biomass fueled plants.

**Indrajeet Chaubey** combined a best management practices tool with a complex genetic algorithm that can search out the best solutions for non-point source pollution control in a watershed. By analyzing data from an area, in just a few hours the tool can compute the most cost-effective pollution-control strategies for water resources affected by agriculture, a process that currently takes weeks or months.

**Monika Ivantysynova** chaired an international panel assessing the research of the Department of Mechanical Engineering at the Helsinki University of Technology (TKK).

**Marshall Porterfield** has created a fiber-optic sensor that is capable of measuring oxygen intake rates and could have broad applications ranging from plant root development to assessing the effectiveness of chemotherapy drugs.

**Kamyar Haghighi** received the 2009 Chester F. Carlson Award in recognition of his distinguished accomplishments from the American Society for Engineering Education (ASEE).

**Indrajeet Chaubey and Bernie Engel** have discovered that Indiana water sources found near fields that practice continuous-corn rotations had higher level of nitrogen, fungicides and phosphorous than corn-soybean rotations. The results of their study will be published in The Journal of Environmental Engineering.

**Bill Field** received Purdue University’s Spirit of the Land/Grant Mission Award. This award honors the efforts to address public issues through research and Extension by an individual faculty member in the College of Agriculture, College of Consumer and Family Sciences or School of Veterinary Medicine.

**John Lumkes** in a recent study compared two 10-vehicle truck fleets using ultra-low sulfur fuel and B20. John found that a 20 percent blend of biodiesel fuel performed as well in these trucks as the standard ultra-low sulfur diesel.

**Nate Mosier** presented a seminar “The Tactical Garbage to Energy Refinery: “Turning “Waste” into Opportunities” at the Agriculture Green Week seminar.

**Al Heber** is starting a new study aimed at measuring greenhouse gases from dairy cows. This study is part of an industry-wide effort to reduce greenhouse gas emissions related to milk.

**John Lumkes** has been elected to become a fellow of the Purdue Teaching Academy. The Teaching Academy strives to bring together the best teaching faculty across campus to create a collective voice for teaching and learning.

## Faculty Promotions

**Indrajeet Chaubey** - promoted to Associate Professor without tenure to Associate Professor with tenure

**Joseph Irudayaraj** - promoted to Full Professor

**Chang Lu** - promoted to Associate Professor

**Nathan Mosier** - promoted to Associate Professor

**Further Details Available On  
Our Web Page At:  
[www.purdue.edu/ABE](http://www.purdue.edu/ABE)**

# 2009 ABE STUDENT NEWS

**Chandana Namburi** a senior in Biological Engineering, was chosen as a Purdue Ag Ambassador for 2009. Purdue Ag Ambassadors are student volunteers who represent the College of Agriculture in a variety of ways. They lead campus tours for parents, visitors and prospective students, give presentations about careers in agriculture, and college life, represent the college of Agriculture at information fairs and host alumni and dignitaries at college and university events.

**Rob Stuthridge's** poster entitled "Health effects of whole-body vibration on tractor drivers with paraplegia and lower limb impairments" was awarded first place in the Graduate/Resident poster competition held at this year's Indiana Rural Health Association Annual Conference in Indianapolis.

**Isaac Emery's** poster titled "The Impact of Dry Matter Loss During Biomass Storage on Net Greenhouse Gas Emissions from Biofuels Production" was awarded 2nd place at the Purdue Ecological Sciences and Engineering (ESE) symposium poster competition. Isaac is a PhD student in ESE and ABE working with Dr. Mosier.

**The ABE Department hosted a Brunch/Open House for Homecoming, which was Saturday, October 3rd. The ABE building was open for tours and many alumni joined faculty, staff and students for a nice brunch, viewing of our Senior design projects, Quarter Scale Tractor Contest, BUV and Cameroon, Africa trip, as well as catching up with other ABE alumni. We plan to have another ABE Homecoming Brunch/Open House next year, details will be available on our web page!**

**Amanda Alberg, James Bartlett, Craig Cessna, Anne Dare, Nathaniel Kempfert, and Andrew Pursifull** from the ASABE student chapter traveled to Reno, Nevada for the 102nd Annual International Meeting. While at the meeting, students showed support for one another at technical and poster presentations, attended council meetings, and networked with faculty and professionals.



ASABE students at ASABE meeting in Reno, Nevada

**The ABE department is pleased to welcome the following new students into our number one ranked graduate program!**

- Nda-Agyima Addae-Mensah
- Matteo Pelosi
- John Michel
- John Andruch
- Cibin Raj
- Craig Barcus
- Steve Riedel
- Brittany Book
- Alice Robinson
- Jingjing Guo
- Isaac Serbin
- Salah Issa
- Scott Stella
- Jennifer Kahn
- Jing Tan
- Tian Lan
- Elizabeth Trybula
- Rebecca Logsdon
- Gabe Wilfong

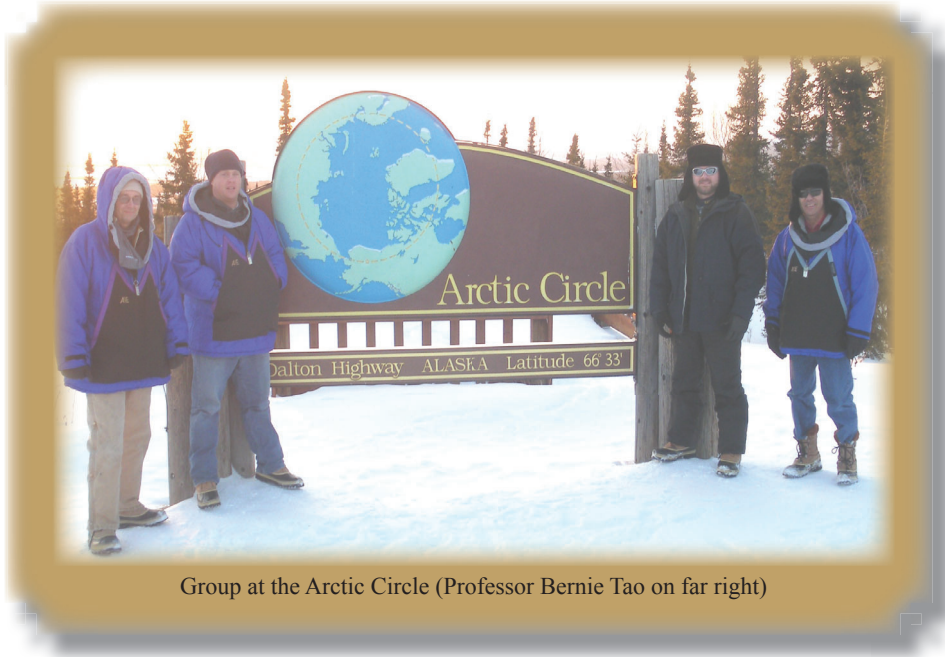
**ABE Quarter Scale Tractor Team** - The 2008-2009 Purdue Quarter Scale student design team capped off another very successful year, finishing third overall at the international ASABE 1/4 Scale Tractor Student Design Competition. The competition was held in early June in Peoria, Illinois.

The 2009 Purdue team designed a 4-engine tractor that placed consistently high in all events. Purdue finished 2nd in overall design points and sound, 5th in both the tractor pull and maneuverability, and 10th in the written report category. Participants included John Lumkes (faculty advisor), Derek Hostetler, Matt Duncan, Robert Caylor, Michael Gregg, John Mahrenholz, Josh Smith, Ashley Johnson, Michael Holland, James Bartlett, Craig Cessna (team captain), and John Andruch.



The competition is in its 14th year and this year saw 23 teams from the United States and Canada participate. Students are judged not only on how well the tractor performs, but also in written reports, oral presentations, five design categories including serviceability, manufacturing, safety, ergonomics, and sound.

# ABE VISITS ALASKA



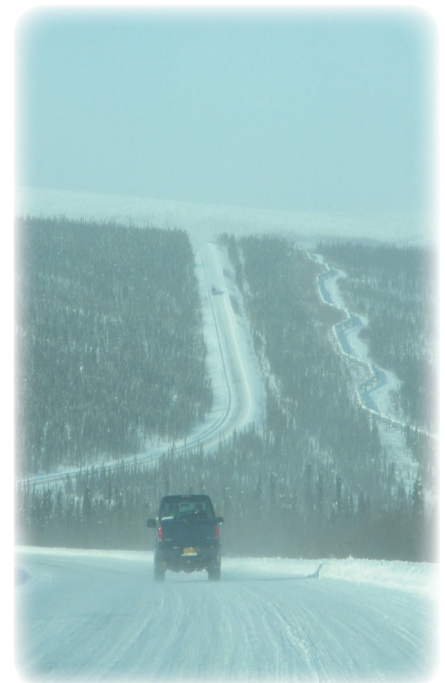
Group at the Arctic Circle (Professor Bernie Tao on far right)



Professor Bernie Tao with outdoor thermometer at minus 50 degrees

Professor Bernie Tao and his students have developed a refining process that produces B100 biodiesel fuels which remain liquid at extremely cold temperatures down to -57 C. This technology has been patented and trademarked under the name Permaflo®.

Several thousand gallons of Permaflo® biodiesel fuel, refined at Integrity Biofuels, an Indiana biodiesel producer, were used around Indiana last winter, as well as being shipped to Alaska last January. In collaboration with Professor Andrew Soria at the University of Alaska at Fairbanks and sponsored by the Indiana Soybean Alliance (ISA), Professor Bernie Tao used the Permaflo® refined B100 fuel in trucks and buses driven from Anchorage to Fairbanks (during a blizzard that dropped 2 feet of snow in 12 hours), and later up to the Arctic Circle on ice roads, where tests were conducted overnight using pure B100 in diesel electrical generators (while camping in tents on the frozen tundra!). For those interested, Dr. Tao has a number of colorful stories related to why camping outdoors north of the Arctic Circle in the winter is not a very good idea. For those who watch the Discovery TV Channel, the program Ice Road Truckers in Alaska was ongoing at the same time these tests were being conducted, if you want to see the environment involved in conducting these tests.



Alaska ice road to Arctic Circle - Arctic pipeline on right



After thawing out and driving back to Fairbanks, Professor Tao and representatives from the ISA met with government and industrial officials and held a seminar in Fairbanks to discuss how this technology could benefit commercial and military users of locally-produced, green biofuels in Alaska. A patent application has been approved on this technology and a commercial bioenergy engineering design company has been engaged to commercialize the Permaflo® refining technology.

Biodiesel is a renewable, environmentally friendly alternative fuel that is made with vegetable oils, animal fats or recycled restaurant greases. In cold conditions, like typical winter conditions, biodiesel fuel has a tendency to gel sooner than regular diesel, blocking filters and causing engine performance problems. This results in biodiesel fuels not being used during winter/cold climate conditions. Professor Tao's refining technology will allow biodiesel fuels to be used year-around and under the coldest winter climates, like at the Arctic Circle!



# ABE NEWS AND EVENTS

## Professor Field Named ASABE Fellow

William E. Field, ABE professor and extension safety specialist, was recently honored and recognized for his outstanding accomplishments as a national leader of agricultural safety and health promotion through engineering and education by ASABE.

Field has spent the past 38 years engaged in the field of agricultural education developing the next generation of professionals in the agricultural safety field, along with efforts to apply technology to enhancing the safety and health of agricultural producers, workers, and their families. During his years as professor at Purdue University, Field has provided instruction to thousands of students, along with tens of thousands of farmers, ranchers, agricultural workers, agribusiness owners, and rural emergency first responders concerning agricultural safety and health issues.



Professor Field

Field has made extensive use of agricultural media to promote safer and healthier work practices. He has prepared more than 575 news releases and articles and participated in 330 radio and television interviews. More than 135,000 copies of “Responding to Agricultural Emergencies”, of which he was technical editor, have been distributed nationwide, significantly enhancing the readiness of rural emergency personnel. He led the development of one of the first web sites on farm safety, [www.farmsafety.org](http://www.farmsafety.org), and currently oversees several others.

In 1979, Field established the Breaking New Ground Resource Center that continues to serve the needs of farmers and ranchers throughout the U.S. who have been impacted by disabilities. This effort contributed to the establishment of the USDA AgrAbility Program that now serves farmers and ranchers through 22 state and regional projects.

A 28-year member of ASABE, Field has held the position of associate editor for the Journal of Agricultural Safety and Health for many years. He chaired the original T-2 Safety committee and has also served on numerous other safety-related standards committee’s as well as the NAMIC Engineering Safety Award committee. In addition to various other professional awards, Field’s ASABE awards include the Young Extension Worker award and Packer Engineering Safety award, and 27 Educational Aids Blue Ribbon awards.



## Purdue University President Dr. France Córdova joins the Agricultural and Biological Engineering Department’s Welcome Back Picnic!

The annual Agricultural and Biological Engineering Welcome Back Picnic was once again a huge success. Over 300 ABE undergraduate and graduate students joined the ABE faculty and staff for a wonderful “Welcome Back” event on September 10th.

The ABE department was recently named the number one graduate program and the number two undergraduate program by U.S. News and World Report. Joining the department to help celebrate these outstanding achievements was Purdue University President, Dr. France Córdova, who spoke to students about the unlimited career opportunities they would have with their ABE degree.

Also joining in the celebration and congratulations were Dr. Leah Jamieson (John A. Edwardson Dean of Engineering and Ransbury Distinguished Professor of Electrical and Computer Engineering), Dr. Jay Akridge (Glenn W. Sample Dean of Agriculture) and Dr. Dale Whittaker (Associate Dean and Director of Academic Programs in Agriculture).



# ABE ALUMNI UPDATE

**Toni (Trepanier) Torsell (BS ABE '06) and Chris Torsell (BS ABE '06)** - have a new family member! Logan Thomas Torsell joined the family on June 19th and he weighed 6 pounds 13 ounces and was 19.5 inches long. Chris is employed by Clarion Packaging and Toni is a Design Engineer for Hagie Manufacturing which makes agricultural sprayers and detasslers.

**Amy Penner (BS ABE '07, MS ABE '08)** - is an Associate Engineer in the Advanced Process Research Division with Kraft foods in Glenview, Illinois. Amy says that her group looks at using new technology to solve a wide assortment of challenges and she is really enjoying her work. Aside from work she is enjoying running, tennis, golf, basketball and learning to play the violin.

**Thomas Burke (BS ABE '79)** - is President and CEO of Modine Manufacturing Company which has been a worldwide leader in thermal management for almost 90 years. The Modine Manufacturing Company designs, engineers, tests and manufacturers heat transfer products for a wide range of applications and markets.

**Jim Sell (BS ABE '69)** - has been elected President of the Purdue Alumni Club of Hendricks County. Jim reports that there are 1,266 Purdue Alumni Members in Hendricks County.

**Veronica Valladolid (BS ABE '00)** - is a Civil Engineer in DuPage County's Stormwater Management Division, located in Wheaton, Illinois.

**Karen Lewis (BS ABE '01)** - will be starting law school in Illinois in August.

**Matt House (BS ABE '06)** - is now working at Butler, Fairman and Seufert in Indianapolis as a Transportation (Road) Engineer.

**Matt Jarrett (BS ABE '95)** - is working for Allen County in the Surveyor's Office doing Stormwater Drainage Reviews and Erosion and Sediment Control Reviews/ Stormwater Pollution Prevention Plan Reviews for new construction projects. He serves as the Stormwater Quality Manager for the county and is involved in establishing educational programs, illegal dumping prevention and detection programs, and municipal facility water quality programs along with the new construction water quality reviews. He reports to IDEM annually on these programs and activities.

**Akilah Martin (MS ABE '02, PhD ABE '05)** - has accepted an Assistant Professor Tenure Track at the School for New Learning (SNL) at DePaul University. The SNL provides a unique approach to learning for adults with customized programs that build upon abilities and experiences, and adds knowledge and development skills to help achieve personal and professional goals.

**Sean Kimmel (BS ABE '07)** - has accepted the position of Area III Engineer in Farmville, Virginia with NRCS. He also reports that his second child was born in their car! All family members are fine and Sean says it is a "crazy" story.

**David Pyle (BS ABE '08)** - was recently featured in the Journal Gazette. David has taken a Plant Engineer position with Poet an ethanol plant in North Manchester Indiana. His boss says that his fresh ideas have already improved efficiency at the plant. Working for Poet also gives David that opportunity to stay close to home, and help on the family farm.

**Dale Reed (BS ABE '53)** - has retired from Acme Scale (for two years now) and is enjoying retirement in California. Dale received an Honorary Doctorate of Agriculture from Purdue in 2002.

**Don Shoemaker (BS ASM '03)** - was featured in the May 16th issue of Indiana Agrinews. Don resides in Jackson County and farms about 1,000 acres of corn, soybeans, wheat and hay in the southern part of the county. Don also does contract work as a discussion moderator for Beck Agriculture, an agriculture marketing company.

**Bruce McKenzie (BS ABE '50 and Professor Emeritus)** - was selected as a 2009 Honorary Master Farmer. Purdue University College of Agriculture is a proud sponsor of this award which dates back to 1968 and recognizes a select group of outstanding Indiana farmers.

*Good Luck to ABE Associate Professor Chang Lu who recently accepted a position with Virginia Tech - the ABE department will miss you!*

# PURDUE UNIVERSITY

Published for Alumni and Friends of  
the Department of Agricultural and  
Biological Engineering



Newsletter:  
Micky Creech, Editor



<http://www.purdue.edu/abe>

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## CALENDAR

### November

- 1 Daylight Savings Time Ends
- 7 Purdue vs Michigan
- 11 Veteran's Day
- 14 Purdue vs Michigan State
- 21 Purdue vs Indiana
- 25 Student Thanksgiving Break Begins
- 26 University Holiday
- 27 University Holiday
- 28 Student Thanksgiving Break Ends

### December

- 12 Classes End
- 19 Semester Ends -  
Student Break Begins
- 20 Graduation - 9:30 am  
Agriculture and Engineering
- 21 Winter Solstice
- 24 University Holiday
- 25 University Holiday
- 31 University Holiday

### January

- 1 University Holiday
- 11 Classes Begin
- 18 University Holiday

*ABE Alumni!  
We Want To Hear From You!*

*We would like to keep in  
touch with you about ABE  
activities and events, as well  
as other college and  
department events, so be sure  
you send your e-mail address  
to Micky Creech at  
[mcreech@purdue.edu](mailto:mcreech@purdue.edu)*

