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INSIDE VT WOOD

Reminder...

Remember to submit department news items by Friday 3 p.m. of each week to Will Pfeil at wpfeil@vt.edu for inclusion in Inside VT WOOD each Monday morning. All past issues of Inside VT Wood reside on our department website under the publications link.

News From Paul Winistorfer

- Our manufacturing systems faculty position search committee has begun screening the applicant pool and will be presenting a recommended slate of candidates to the department in the coming weeks.
- We have six undergraduates traveling to Williamsburg for the VFPA meeting on Friday and Saturday.
- I will be presenting an update at VFPA about WoodLINKS in Virginia, and will welcome Dr. Carlyle Ramsey President of Danville Community College, and Mr. Ted Bennett, Executive Director of the Southern Virginia Higher Education Center in South Boston to the podium with me to contribute to the presentation about educational programming for the wood industry in Virginia.
- Faculty met again last Friday afternoon in a work session to address changes to our graduate program in the department, and will continue to meet as we move toward updating and revisions to our graduate education in the department.
- Cooperating with the other department heads in the bioprocessing/biomaterials cluster, we submitted a proposal for PhD Fellowship support from ICTAS (Institute for Critical Technology and Applied Sciences). Our proposal would result in a new PhD Fellowship in our department, as well as the other three departments.

All-Student Meeting Was Successful

We had 52 people attend our All-Student meeting last week to talk about advising, option selection, wood enterprise institute, and a variety of other topics. This was a great turn out of students and faculty in our wood community. We consumed 20 pizzas if that is a measure of success!

Wood Enterprise Institute Meets Weekly

Dr. Kline, Dr. Bond, David Jones and 11 students are meeting weekly to lay the ground work for the Wood Enterprise Institute summer activity. These students are enrolled in a 1-credit special problems course to develop a plan and a plan of work for the summer. Faculty and anyone in the department interested in the Wood Enterprise Institute are welcome at the weekly meeting – Wednesday's 5:30 pm Brooks classroom.

CALL FOR POSTERS AT ANNUAL SWST MEETING

SWST Annual Convention

June 10, 2007

Hilton Hotel/Knoxville Convention Center Knoxville, Tennessee

We invite submissions for a technical forum on “Applications of Advanced Analytical Tools to Lignocellulosic Materials Science.” The forum will be held concurrently with a technical session on Advanced Analytical Tools and a Technical Forum of Analytical Equipment Manufacturers and Distributors.

Please see the attached application to participate and submit to Vicki Herian <vicki@swst.org> no later than February 21, 2007.

Victoria L. Herian

Executive Director

SWST

One Gifford Pinchot Drive

Madison, WI 53726

Phone: 608-231-9347

Fax: 608-231-9592

E-mail: vherian@fs.fed.us

Hammett Participates in Northern Virginia Faculty Meeting

The College of Natural Resources has assembled a expert group of part-time and full-time faculty who teach and advise graduate students throughout Virginia Tech’s National Capital Region (NCR). During a college NCR faculty meeting held on January 8th at the Northern Virginia Center in East Falls Church instructors discussed their courses and the success in developing the College’s program there.

Dr. David Trauger, Director of Natural Resource Programs for the Northern Virginia Center reviewed changes in university policies, the ongoing curriculum approval process, the need to get students to form their advisory committees, and progress in completing degrees by the over 50 graduate students enrolled in the program. All faculty teaching

courses in natural resources through NCR participated in the evening-long meeting.

Dr. Hammett represented the College’s Blacksburg faculty at the meeting.

Hammett

presented to

the faculty a summary of student feedback on the course he teaches from Blacksburg to graduate students at the Northern Virginia campus through distance learning technologies.

Dr. Gary Evans presented a progress report on the College’s Natural Resources Distance Learning Consortium and plans for its expansion. Then consortium offers courses to federal employees and other professionals who often are located in areas too remote to attend classes in person. Dr. Hammett’s course, Global Issues in Natural Resources, taught for the past three years with Dr. Trauger, was one of the first courses offered by Virginia Tech through the consortium.



Hammett Teaches in VCE In-service Conference

In September, the Department hosted a workshop for the key leaders of the Virginia Cooperative Extension (VCE) system. The purpose of this meeting was to inform the VCE administrative team of the Department's current and potential involvement in outreach (engagement). Many of our faculty presented summaries of their current research and outreach experience to the visitors. After this visit, Tom Hammett was invited to develop and present a class to the annual VCE In-service Training Academy held in Charlottesville on January 18. Over 400 persons were involved in this year's academy, where participants each took several of the nearly 80 workshops and classes presented. Hammett's class was focused on identifying and fostering enterprises that make or utilize alternative forest products (i.e., NTFPs).

Many of the fifty students requested additional information on our programs, and as a result of this first class opportunities for our faculty to participate in additional VCE organized events are now being discussed. Besides more information on alternative products (NTFPs etc.), safety in construction and business planning methods are two subject areas that have been expressed as needed for future programs.

Virginia Forest Products Association Annual Meeting, Feb 2-4, 2007, Williamsburg Virginia

- Seven of our students, Adam Scouse, Dan Roethle, John Foster, Jon Frey, Tim Coplan, Garrett Norman, and Richard Bonsi will be traveling to attend the VFPA meeting.
- Brandon Martin (Forestry Masters student) and Earl Kline will be presenting at the VFPA on the use of GIS technologies to portray and visualize "woods to goods" supply chains. This is one of the multidisciplinary projects supported by the Sloan Forest Industries Center and the USDA Forest Service Wood Education and Resource Center.

13 of our undergraduate students have signed up for a 1-credit undergraduate research seminar class to help in the planning of the Wood Manufacturing Enterprise Institute. The purpose of this class is to conduct research to determine what product to manufacture and to complete a business plan. All faculty are invited to participate and see how the class progresses by logging into Scholar (<https://scholar.vt.edu> and then select the WEI tab). If anyone is unable to access the site, please contact Earl Kline.

Workshop on Lessons Learned in Distance-Learning

The College has a small but growing number of classes taught using distance learning methodologies. Dr. Hammett, who organized one of the College's first distance learning classes, was invited to participate in a workshop on January 8th focused on distance learning that was organized and hosted by Virginia Tech's National Capital Region Natural Resources Program.

The invited participants included instructors who teach online courses for the College (most came from Virginia, but one came from Colorado!) and Dr. Gary Evans, the director of Virginia Tech's Natural Resources Distance Learning Program. The workshop sought to evaluate the effectiveness of our current distance-learning program and develop ways to improve online course offerings. One special emphasis was to seek ways to help faculty new to teaching online to adopt and use distance learning techniques.

Five instructors shared lessons they had learned from courses they have developed and taught through Virginia Tech's Natural Resources Distance Learning Program. Dr. Evans and Dr. Hammett will participate in a major proposal to USDA to gain support for mentoring junior faculty in organizing and presenting online courses, and to increase the number of courses offered through the Natural Resources Distance Learning Program.

New processing steps promise more economical ethanol production

By Susan Trulove

Y. H. Percival Zhang

BLACKSBURG, VA., March 30, 2006 -- Why isn't ethanol production growing by leaps and bounds in the face of higher gasoline prices? Ethanol production from cornstarch is a \$10 billion dollar business in the United States and 4 billion gallons of ethanol will be produced in 2006. In his 2006 State of the Union address, President Bush called for doubling ethanol production by 2012, and replacing 75 percent of Middle Eastern oil with bioethanol from renewable materials by 2025.

"We have the technical ability, but making ethanol production economical is the problem," said Y.H. Percival Zhang, assistant professor of biological systems engineering in the College of Agriculture and Life Sciences at Virginia Tech. Zhang has developed a more cost effective pretreatment process that he will report on at the 231st American Chemical Society National Meeting in Atlanta March 26-30.

Ethanol now comes from corn kernels. "But that is food," Zhang said. "If we want to produce 30 to 60 billion gallons of ethanol, which is what is needed to meet the President's goal, we have to use the entire plant, or the stover (leaves, stalks, and cobs), and leave the kernels as food." The largest challenge for bioconversion from raw materials to bioethanol is high processing costs, resulting in higher prices for bioethanol than for gasoline.

Corn stover is the most abundant agricultural residue in the United States. The challenge is separating the sugars from the lignocellulose -- the combination of lignin, hemicellulose, and cellulose that form plant cell walls. Many technologies have been developed to convert lignocellulose to sugars, but the costs are still high and sugar yields are low. "No one wants to take the risk -- to invest \$1 billion in a large-size biorefinery based on lignocellulose," said Zhang. "Processing costs are also high. It requires chemicals, utilities, enzymes, and recycling in the pretreatment and the sequential processing stages."

Zhang's cost-effective pretreatment process that integrates three technologies - cellulose solvent pretreatment, concentrated acid saccharification, and organosolv, and overcomes the limitations of existing processes. Instead of a high pressure system that operates at between 150 and 250 degrees C, Zhang's "modest reaction" operates at atmospheric pressure and 50 C (120 F) to pretreat corn residue to free the solid polymeric sugars. In a several-step pretreatment system, Zhang uses a strong cellulose solvent instead of highly corrosive chemicals, high pressure, and high temperature to breakup the linkages among lignin, hemicellulose, and cellulose.

During Zhang's gentler process, there is no sugar degradation and inhibitor formation. In the following step, he creatively uses a highly volatile organic solvent to precipitate dissolved cellulose, extract lignin, and enable effective chemical recycling. After pretreatment and reagent recycling, lignocellulose can be fractionated into four products: lignin, hemicellulose sugars, amorphous cellulose, and acetic acid. "Co-products can generate more income, making biorefinery more profitable, and enable satellite biorefineries that fully utilize scattered lignocellulose resources," said Zhang. "For instance, lignin has many industrial uses, from glue to polymer substitutes and carbon fiber; and xylose can be converted to a healthy sweetening additive - xylitol, or to the precursors for nylon6."

Amorphous cellulose, which is converted from crystalline cellulose, is another advantageous product from Zhang's process because in this form the cellulose material is more accessible for further hydrolysis, resulting in a higher sugar yield, higher hydrolysis rate, and less enzyme use. Zhang tested amorphous cellulose hydrolysis by adding special enzymes (Trichoderma cellulases) from Genencor International. The result is that about 97 percent of the cellulose is digested after 24 hours of the hydrolysis process.

The paper, "Novel lignocellulose fractionation featuring modest reaction conditions and reagent recycling" (FUEL 143), by Zhang and LeeR. Lynd of the Thayer School of Engineering at Dartmouth College will be presented at 1:50 p.m. Thursday, March 30, in the Georgia World Congress Center room C203 as part of the Advances in Fuel Science and Technology session.

Zhang, who has been at Virginia Tech since August 2005, began his research at Dartmouth Thayer School of Engineering, where he received his Ph.D., was a postdoctoral research associate, and then a research scientist. He and Lynd have applied for a U.S. patent for this pretreatment, which has been licensed to the bioethanol start-up

company, Mascoma Co. After joining Virginia Tech, Zhang made another significant improvement based on the previous patent, and Virginia Tech has filed for a global patent.

Zhang is collaborating with the National Renewable Energy Laboratory and Oak Ridge National Laboratory, using NREL software to analyze the economic costs of various ethanol production strategies and ORNL facilities to test different enzymes and material performance. "NREL and ORNL have spent 30 years on lignocellulose processing, biocatalysis, and bioenergy research, and are glad to cooperate on new technologies which can effectively overcome the recalcitrance of lignocellulose," Zhang said. "We hope to soon establish the first pilot plant in Virginia based on this new technology with switchgrass." Zhang will also present at the 28th Symposium on Biotechnology for Fuels and Chemicals in April.

American Chemical Society Abstract

Overcoming the recalcitrance of lignocellulosic materials is one of the largest technical obstacles for the production of chemicals and fuels from renewable lignocellulose. Here we demonstrate a novel concentrated phosphoric acid/acetone lignocellulose pretreatment, which has four distinctive features: modest reaction conditions, fractionation of lignocellulose into amorphous cellulose, hemicellulose sugars, lignin, and acetic acid, generation of highly reactive amorphous cellulose, and cost-effective reagent recycling. Hydrolysis results of pretreated corn stover showed that about 97 percent cellulose was digested after 24 hours of hydrolysis at the enzyme loading of 15 filter paper unit/gram cellulose.

This technology would offer several potentially economic benefits:

1. An increase in total revenue
2. A decrease in processing costs
3. A low capital investment for a small biorefinery
4. Lower transportation costs for feedstock
5. Low investment risks due to the integration of several mature technologies

General Announcements

To: Deans, Department Heads, and University Center Directors

From: Andrew Becker (andrew.becker@vt.edu), Chair, University Council for International Affairs

Please distribute as widely as possible:

Below are the announcements and deadlines for two Alumni Awards dealing with international activities of our faculty and staff--

Alumni Award for International Education Alumni Award for International Outreach and Research

The parameters are in the description, but n.b.: the deadline is relatively soon: Wednesday, 21 February 2007.

Since we cannot send attachments via the DDD list, please get in touch with Sarah Mitchem (oapia@vt.edu) and/or Andrew Becker (andrew.becker@vt.edu) for an attachment, if desired.

Dr. Andrew S. Becker

Chair, University Council for International Affairs Co-Director, Spring Semester in Switzerland Center for European Studies and Architecture

Riva San Vitale, Switzerland

College of Liberal Arts and Human Sciences Associate Chair, Dept of Foreign Languages & Literatures Assoc Prof of Latin, Ancient Greek, & Classical Studies

Alumni Award for Excellence in International Education Alumni Award for Excellence in International Outreach and Research

By Andrew Becker, Chair University Council on International Affairs

January 24, 2007

Below is an outline of the nomination process for the Alumni Award for Excellence in International Education and for the Alumni Award for Excellence in International Outreach and Research. This was formerly one award in

international education. With the support of the Alumni Association, we have been able to provide two awards, each focusing on a distinct area of international work: education, and outreach/research.

Please share this information with your faculty and staff and request that they nominate those who are deserving of these awards. The nomination deadline is Monday, February 21, 2007.

The recipient of the Alumni Award for Excellence in International Education and the recipient of the Alumni Award for Excellence in International Outreach and Research will each receive a monetary award of \$2,000 and a plaque. The Alumni Awards are conferred during the honors convocation in the fall.

Please send nomination letters and support materials to:

Sarah Mitchem oapia@vt.edu

Administrative Assistant to Dr. S. K. De Datta Associate Provost for International Affairs and Director, Office of International Research, Education, and Development
134 Burruss Hall (0265)
Virginia Tech

Please see the following for more information.

I) ALUMNI AWARD FOR EXCELLENCE IN INTERNATIONAL EDUCATION

Description of Award

This award recognizes contributions by faculty and staff members that have demonstrated an impact on international education at Virginia Tech. The honor is explicitly aimed at according recognition to individuals whose efforts have resulted in thoughtful programming, curricula or approaches to international education including:

- * Service to the community
- * Education Abroad
- * Services to international students and scholars
- * Curriculum development
- * Program development
- * External partnerships, awards, and recognitions

Criteria

The selection committee will consider:

1. Contributions to the internationalization of Virginia Tech 2. The impact on students 3. The impact on the campus and community 4. The significance of the initiative 5. The sustainability of the initiative Honorees may evidence some or all of the above forms of exemplary activity.

Nature of Award

This award is sponsored by the Virginia Tech Alumni Association. The winner is selected by the University Council of International Affairs. At the annual Faculty Staff Awards Ceremony, the winner receives a suitable memento and a \$2,000 stipend funded by the Virginia Tech Alumni Association.

Eligibility, Selection Committee Membership, and Nomination Requirements

- Any faculty or staff member or currently enrolled student may nominate an individual for this award.
- Tenure track, administrative/ professional faculty and classified staff members are eligible to receive this honor.
- The selection committee for this award will be named annually by the Senior Vice President and Provost and will be drawn from the membership of the University Council on International Affairs. The selection group may include a representative of the Virginia Tech Alumni Association and a previous award winner.
- Those offering nominations should submit a letter to the selection committee that outlines the specific contributions of their nominee.
- The Office of University Outreach and International Affairs will issue a formal call to the University community for nominations for this honor early in the spring semester of each academic year.

Nominations should include the following information:

1. A description of the nominee's contributions to international education while at Virginia Tech.
2. A letter of nomination and two additional letters of support.
3. A copy of the nominee's Curriculum Vitae.
4. Any additional documentation exemplifying the nominee's international contributions.

2) ALUMNI AWARD FOR EXCELLENCE IN INTERNATIONAL OUTREACH AND RESEARCH

Description of Award

This award recognizes contributions by faculty and staff members that have demonstrated an impact on international outreach and research at Virginia Tech. The honor is explicitly aimed at according recognition to individuals whose efforts are in the area of:

- International scholarship
- Global outreach to regions, countries, communities, public, private, and non-government organizations · Sponsored projects · Innovation in international research and outreach

Criteria

The selection committee will consider:

1. Contributions to the internationalization of Virginia Tech
 2. Global impact
 3. Significance of the research/outreach
 4. Sustainability of the research/outreach
- Honorees may evidence some or all of the above forms of exemplary activity.

Nature of Award

This award is sponsored by the Virginia Tech Alumni Association. The winner is selected by the University Council of International Affairs. At the annual Faculty Staff Awards Ceremony, the winner receives a suitable memento and a \$2,000 stipend funded by the Alumni Association.

Eligibility, Selection Committee Membership, and Nomination Requirements

- Any faculty or staff member or currently enrolled student may nominate an individual for this award.
- Tenure track, administrative/ professional faculty and classified staff members are eligible to receive this honor.
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Nominations should include the following information:

1. A description of the nominee's contributions to international research and outreach while at Virginia Tech.
2. A letter of nomination and two additional letters of support.
3. A copy of the nominee's Curriculum Vitae.
4. Any additional documentation exemplifying the nominee's international contributions.