

INSIDE VT WOOD

Greetings from Cheatham Hall,

In this “Inside VT Wood”, I wanted to highlight one of our many outstanding undergraduate students — **Jandir Santin** — known around Cheatham Hall and the Brooks Center as “JD”. Jandir comes to us from Brazil where his family owns one of the largest sustainable wood processing operations in the State of Acre, which is located in northwestern Brazil – an area that is 86% forested. His family owns and operates both sawmill and veneer/plywood operations which run wood from sustainably managed forests also FSC-certified wood. The Laminados Triunfo Company uses community-produced timber from Acre.

Jandir came to Virginia Tech’s Wood Science and Forest Products department as an undergraduate student because he was looking for the “best of the best” in education in the sustainable natural resources area. He understands that for his family’s company to thrive and grow, and for the economically disadvantaged Brazilian communities in Acre to prosper, that jobs must be created using the abundant natural resources of the region. For both the sake of the environment, and the sake of the people, this needs to be done in a sustainable manner.

“My main reason for being here at Virginia Tech is to get the best education possible. I want to learn about wood products of course, but I also need to understand things like efficient manufacturing, sustainable conservation of the resource through to understanding the legal implications associated with forest harvesting and processing.” Jandir continues; “My goals are to learn the best ways to process timber so that my family’s company can become an even more efficient and sustainable industry.”

Jandir is very much a man with a mission. As a high grade point student, he was selected into the College’s prestigious Leadership Institute this year — the only Wood Science and Forest Products student in that program. He is also the only international student in that Institute this year. He came to Virginia Tech to get the “best of the best” in education, but we can truly say that he also is one of the “best of the best” in seeking to build a better future, and in representing his country. See more of Jandir’s interview on the [next page](#) of this issue of the newsletter.

We are looking for more just like Jandir as we continue to grow the Hokie Nation internationally, particularly in the field of sustainable biomaterials, and in sustainable resources education. Keep watch in future editions of this newsletter as we highlight other students and also our faculty members.

As always, just let us know if you have questions, comments, or just want to say Hello with a bit of news. Thank you.

Barry

Barry Goodell

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Jandir Santin with his father in the Amazon Rainforest

INTERVIEW WITH JANDIR SANTIN – From Brazil to Virginia Tech!

(continued from page 1)

BARRY GOODELL: Why do you think other international students might wish to attend Virginia Tech and be part of our Department?

JANDIR SANTIN: There is no better program, and most countries simply do not have the educational resources and knowledge in the wood products, sustainable materials and environmental areas to compare with what is offered at Tech. I know the knowledge I gain here will allow me to make a real difference in the world, and I think other international students need that too.

GOODELL: How will you use the knowledge acquired at VT to make a difference in the world?

SANTIN: Wood industries have been part of my life for a long time. My parents never had the chance to study wood in more depth. My international experience with my major in Wood Science at Virginia Tech is providing me the technical and educational side of being in the wood business. The educational knowledge acquired at VT is crucial to me and will allow our family forest products business back in Brazil to be even more sustainable. The technical side that I am learning about involves classes with hands-on experience. Throughout my major, I have gone to various business plants, learned about lean manufacturing, experienced lab exercises involving wood, adhesives performance in wood, OSB manufacturing, and wood mechanical properties testing. These are only a few examples of the many hands-on experiences I have learned from this great program. The all-around knowledge acquired will give me the expertise needed to reach a successful manager position in the near future.

GOODELL: Would you still study wood and care about sustainability issues if you did not come from a “wood background?”

SANTIN: When I was a little kid, I asked my father a question that I will never forget. The question was: “Father, would you be mad at me if I decide to not work with you in the future?” His answer was the most sincere response I could ever have. He answered: “My son, I will support you in any career you choose.” My life had a different concept after that conversation. I did not come to Virginia Tech because I already loved wood. I actually came here to discover why wood is so exceptional. Wood is the best and most sustainable material on Earth. Because of the wonderful job the high-level professors in the Wood Science department do, I now truly love and believe in what I do. And what I want to do is to create a more sustainable environment while still creating jobs and growing a future for people in my country who choose to work with wood and other natural resources.

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SPOTLIGHT

on a Visiting Business Student from Costa Rica



Costa Rican student Melissa Brenes enjoying another glorious Hokie Football Game.

Melissa Brenes, a Costa Rica Tech (www.tec.ac.cr) senior majoring in Business Management is visiting Virginia Tech to conduct research in organizational innovation. Melissa is working under the direction of Dr. Henry Quesada. She is collaborating with doctoral student **Johanna Madrigal, of Costa Rica**, to determine inhibitors and drivers that affect the sustainability of the continuous improvement process in manufacturing settings.

Students at Costa Rica Tech are required to deliver a graduation project during their senior year and the project must be defended before a Committee. Melissa will be defending her graduation project during the second half of November. After defending her graduation project, Melissa will be applying to the Graduate School at Virginia Tech.

Melissa's work was presented at the Interdisciplinary Research Symposium held in November 5 at Virginia Tech where she co-authored two posters with doctoral student Johanna Madrigal and masters student **Shawn Crawford**.

In addition to her research Melissa enjoys baking, dancing, and laughing, and now she has become a Hokie fan! She is definitely having a good time at Virginia Tech, and brings cheerful time to our grad student's loft!

If you wish to contact Melissa, please email her at melibreas23@gmail.com

Just a Quick Preview: WOOD DESIGN and CRAFTSMANSHIP

This is not a new degree, but rather a “Track” that is being proposed now by our Department. We think it will be very appealing to students, and help draw interest to the major. It promotes a 4-course sequence that we already offer, but we are “packaging” those courses a bit differently to help promote our whole degree in new ways.

Virginia Tech offers students an in-depth 4-year degree program where students who choose, receive a strong background in wood design and craftsmanship. Students electing this sequence are well-educated in wood processing, and woodworking skills, while also getting a complete background in entrepreneurial and business skills as part of our 4-year degree program.

Our Wood Design and Craftsmanship 4-course sequence is unique among American Universities. We do not offer short-courses in woodworking. We recognize that the talent for becoming a master craftsperson lies within the individual and requires long experience. We provide students with a deep understanding of wood combined with hands-on design and craftsmanship education comparable to the level of training received from several cabinet making and furniture design programs. Students receive hands-on woodworking training and design and craft their own projects. Education includes the use of traditional hand-tools to computer-aided design, all under the guidance of our skilled faculty and staff.

For those with the talent, interest, and passion to become an entrepreneur, and ultimately to craft and market their own designed wood furniture and cabinetry, we offer an educational program within our 4-year BS degree that is second to none. For students interested in this area, our Forest Products Business, or Residential Wood Structures options are the two best Degree options to select from. Your program can be tailored to your individual interests in the selection of elective courses in consultation with your advisor.

Packaging Homecoming Day Event

By Young T. Kim

On Friday, October 21st, Virginia Tech’s homecoming football game day, the Virginia Tech Packaging program had a special promotional event for VT alumni and family sponsored by the Department of Wood Science and Forest Products and two major packaging companies, MeadWestvaco (MWV) Corp. of Richmond, VA and PepsiCo, Inc. of Purchase, NY.

The day was spent focusing on promoting the sustainable packaging program at VT-Packaging and fundraising for the Institute of Packaging Professionals student chapter (IoPP).

For this event, MWV donated ten thousand bioplastic-coated (PLA) compostable cups that will be naturally composted within 12 weeks at a composting facility. It is one of few recent new developments in “Sustainable Packaging Products” that has been certified by the Biodegradable Products Institute (BPI). Pepsico, committed to protecting the earth’s natural resources through innovation and the efficient use of land, energy, water and packaging in all our operations, sponsored two pallets of 2-liter Pepsi bottles for this special event.

While promoting the programs and activities of the student group, IoPP students provided VT alumni and family with not only hot coffee during the unusually chilly morning time, but also Pepsi in the tired and thirsty afternoon using the compostable cups.

It was a great experience for students and faculty to learn about the “Impact of Sustainable Packaging” and to reach out to VT alumni and family, who were tailgating at campus, with the message: “VT-Packaging is growing and trying to improve the sustainable and green technology in the field of packaging”.



Pack Expo 2011 – Las Vegas

By Laszlo Horvath

Pack Expo is one of the biggest events in the packaging industry bringing broad range of suppliers, manufacturers, and customers of various packaging solutions together. Two faculty, [Dr. Young Teck Kim](#) and [Dr. Laszlo Horvath](#), represented the packaging program at Virginia Tech during the expo.

The expo provided a great networking opportunity with the relevant packaging industry and also provided a platform to learn about the latest technology. Talking with the companies it became apparent that the packaging industry is moving toward sustainability and significantly advanced in the area of packaging automation. Despite the great distance and the significant expense, two packaging undergraduate students, senior, **Nick D’Amico of Williamsburg, Va**, and sophomore, **Nate Slemp of Sugar Grove, Va**, decided to participate in the Expo to broaden their knowledge in the packaging field and to build their professional network. “The pack expo put an excellent perspective on the industry. It has allowed a prospective individual in the packaging field to better encompass the depth of packaging and prepare himself for his future” said Nate Slemp.



1,600 world-class suppliers and 25,000 packaging professionals visited one of the biggest event in the field of packaging, the Pack Expo 2011 Las Vegas.



Nate Slemp (pictured) and Nick D’Amico represented Virginia Tech IoPP Chapter during the Pack Expo.

Major packaging schools such as Michigan State, Cal Poly, and Clemson also participated in the Expo, which provided a great opportunity for the students to build a lifelong personal and professional connection with packaging students and professionals from other schools. “Las Vegas was an amazing opportunity. Not only did I get the chance to meet potential employers, but I got an inside look at the packaging production processes and breakthrough technologies in the field. The expo gives students the chance to network with the students and professors from the other packaging schools. The experiences shared by students and teachers both during and after Expo operating hours solidify relationships between future colleagues in the packaging industry.” said Nick D’Amico.

Henry Quesada Speaks at the Annual Meeting of the Architectural Woodworking Institute

On October 28, 2011, [Dr. Henry Quesada](#), assistant professor at the Department of Wood Science and Forest Products delivered a speech on the need for innovation to the participants of the Annual Meeting of the [Architectural Woodworking Institute](#) (AWI) in Charlotte, NC. This year the AWI meeting attracted more than 250 participants from national and international locations. Dr. Quesada’s speech highlighted the need for innovation especially in small and medium enterprises (SME) such as the AWI’s membership.

According to a recent report by the National Science Foundation, the wood products industry invests four times less in innovation activities than the average manufacturing industry in the United States. This lack of innovation in the wood products industry is slowly becoming an issue of interest among the academic, industry, and government community

given the steady loss of competitiveness of the sector. However, recent research outputs indicate that wood products industries, particularly SME might have an advantage compared to large size firms, to incorporate innovation activities into their strategic and operating activities given their closeness to specific niche markets that require higher levels of customization and customer service.

In his speech, Dr. Quesada reiterated on several occasions that wood products firms such as architectural woodworking industries need to truly understand customer needs and incrementally improve their business processes to provide their customers with unique value added products and services. Dr. Quesada also

indicated that SME needed to create and maintain an internal culture to foster innovation. Some of the drivers to sustain the innovation process point to teamwork effort, slack time for employees to be creative, and elimination of internal barriers and contradictions that inhibit the innovation process.

If you wish to learn more about the need for innovation and manufacturing, please contact Dr. Henry Quesada at quesada@vt.edu



Dr. Henry Quesada speaks at the AWI Annual Meeting.

Wood-Based Composites Center hosts Advanced Wood Adhesion Short Course



State University). Also pictured here are the twelve short course participants representing the adhesives, coatings, and wood-based composites industries across North America. The WBC is a National Science Foundation Industry/University Cooperative Research Center that supports the research and educational needs of the wood-based composites industry.

The [Wood-Based Composites Center](#)

(WBC) held the Advanced Wood Adhesion short course on November 2-3 in Blacksburg. The course was organized and taught by Linda Caudill (WBC Managing Director), David Dillard (Professor, Engineering Science and Mechanics, Virginia Tech), Chip Frazier (Professor, Wood Science and Forest Products, Virginia Tech), and Fred Kamke (Professor, Wood Science and Engineering, Oregon



Wood Science and Forest Products students participate in the first Interdisciplinary Research Symposium at Virginia Tech



Figure 1. Shawn Crawford, Scott Lyon, Melissa Brenes, and Johanna Madrigal during their participation at the IDR Symposium

On November 4, 2011, students Johanna Madrigal, Shawn Crawford, and Melissa Brenes and Research Assistant Scott Lyon participated in the first Interdisciplinary Research Symposium celebrated at the Graduate Life Center at Virginia Tech. Interdisciplinary research is defined as the process of answering a question, solving a problem, or addressing a topic that cannot be dealt with adequately by a single discipline and draws on the ensemble of disciplines defining elements and integrates the insights to produce a more comprehensive understanding or cognitive advancement.

The contributions of the students were presented in poster format. Madrigal and Brenes work under the direction of Dr. Henry Quesada and they presented results revealing how the continuous improvement

process relates to manufacturing firms' strategy and vision and mission statements. Lyon exhibited results on opportunities for Appalachian wood products firms in Central American markets from a research project funded by the Federal State Marketing Improvement Program at the USDA. Crawford, who is co-chaired by Drs. Henry Quesada and Earl Kline, showed preliminary results of his research project titled "Energy Savings through Lean thinking", a project funded by the Wood Education Research Center at the USDA.

If you would like to obtain more information on these research projects and their results, please contact Dr. Henry Quesada at quesada@vt.edu

Packaging Students Recognized in National Design Competition

The [2011 Paperboard Packaging Alliance Student Design Challenge](#) asked students to design unique and functional packaging for a smartphone product aimed at a target market that valued sustainability. Students in Dr. Bush's and Dr. Kim's courses responded with designs that have brought national recognition to the Virginia Tech packaging program.

Nicholas D'Amico and a team consisting of **Dabney Beahm**, **Diana Sullivan**, and **Rosemary Masser** submitted entries that are featured in national promotional materials. Their entries can be viewed at the [PPA website](#) along with those of the nine other schools which competed. *The Fashion Institute of Technology* and *Clemson University* earned the top awards.

Virginia Tech students are planning to submit entries for the 2012 contest which challenges students to design novel packaging for child meals.

Images courtesy of Paperboard Packaging Alliance.



Design entry submitted by Nick D'Amico.



Design entry submitted by Dabney Beahm, Diana Sullivan, and Rosemary Masser.

Wood 5004 Seminar

Day: Friday
Time: 3:00-4:00 pm
Place: 102 Brooks Center
(unless noted otherwise)

Fall
2011

- Aug. 26 **Jung Ki Hong** – Macromolecular Science and Engineering (PhD)
Cellulose Nanocrystal Reinforced Polymeric Scaffolds for Bone Tissue Engineering
- Sept. 2 **Junia Pereira** – Macromolecular Science and Engineering (PhD)
Synthesis of New Pullulan Derivatives for Oral Drug Delivery
- Sept. 9 **Robert Haupt** – Macromolecular Science and Engineering (PhD)
Accelerating Wood Resin Cure: A Model Compound Study
- Sept. 16 **Jiyoun Joo** – Forest Products (PhD)
Modeling the compressive stress distributions at the interface between a pallet deck and distribution packaging
- Sept. 23 **Jonghun Park** – Forest Products (PhD)
An Exploration of Changes in Environmental Sustainability of Packaging, 1971 to 2011
- Sept. 30 **Edgar Arias** – Forest Products (PhD)
Factors Impacting the International Value Chain of Hardwood
- Oct. 13 (Thu) 2–3 pm **Dr. Henri Bailleres** – Agri-Science Queensland
The Forest Product Innovation Team: an Overview to the Research & Development Objectives of the Queensland Government
- Oct. 21 **Dr. Sean McGinnis** – Dept. of Materials Science and Engineering
Life Cycle Assessment (LCA): Applications and Challenges
- Oct. 28 **Shawn Crawford** – Forest Products (MS)
Reducing Energy Waste in the Forest Products Industry
- Nov. 4 **Dr. Urs Buehlmann** – Dept. of Wood Science and Forest Products
Challenges and Opportunities of the U.S. Wood Industry
- Nov. 11 **Justin Morris** – Forest Products (MS)
Reuse and Recycle of Construction Waste
- Nov. 18 **Mohammad Tasooji** – Forest Products (PhD)
Acrylated Epoxidized Soy Oil as an Alternative to Urea-Formaldehyde Resin in Making Wheat Straw Particleboard
- Dec. 2 **Johanna Madrigal** – Forest Products (PhD)
Factors Affecting the Sustainability of a Continuous Improvement Process: A Case Study

Equipment “Wishlist” in the Department to Enhance the Undergraduate Student Experience

CAN YOU HELP US?

With advances in technology and limited budgets, it is often difficult for Universities to keep up and provide students with hands-on experience using the latest equipment. Often, it is not even necessary to have the very latest equipment as the “base model” can provide a good educational experience in our classes and labs.

With that in mind, the Department has put together an Equipment Wishlist to send out to our Alumni and Friends. The hope is that those of you in a position to provide either new or used equipment, or funding to purchase such equipment, might help us out in the Department. Many of these are “big ticket” items, but some are more modest. Depending on your sub-field, some of the equipment may not even have recognizable names! We thought we would try this approach though and see what it might net. Some folks in Industry may be aware of equipment that is being changed out, and the older system may be just perfect for our needs.

Please note that we have limited space in our Brooks Lab facility, so we do need to be selective. The faculty have discussed the list and developed the list based on what they think is most needed, and that will be maximally used.

Thank you for any help, and if you have ideas for other ways to help us bring in important equipment pieces to grow the educational experience for our students, please let us know. Thank you.

Equipment needs for Teaching and Student Learning in Packaging, Mechanics, and Innovation and Design activities at Virginia Tech

Vision: To create a world-class undergraduate student workspace that is recognized and respected as a leading student learning environment for creativity, innovation, and entrepreneurship.

Innovation and Design	Teaching Purpose	Short/Long Term Need
CNC Machine	Rapid prototyping, proof-of-concept testing	Short
CIM Cell (robot/PLC/conveyor/bar code/Rfid)	Automation, materials management	Long
Dust collection system	Minimize/eliminate dust–sustain cleanliness	Short
Finishing/spray booth	Finish technologies and “green” finishes	Long
CAD/CAM studio (hardware & software – Pro E, SolidWorks, etc.)	Product concept, design, and modeling	Short*
3-D scanner	Rapid prototyping, product modeling	Short*
Video conferencing system	Meetings, distance teaching/learning	Short
Electric lift	Facility maintenance	Long
Flexible electrical/air service	Flexible manufacturing and work cells	Short
Saw-stop safety table saw (2)	Safety for students	Short
Mobile end-feed table	Materials management	Short

*Similar to Packaging System & Design request

Mechanics/Sustainable Structures	Teaching Purpose	Short/Long Term Need
MTS controller and data acquisition system	Current system no longer supported by MTS; WOOD 3314, WOOD 2554, WOOD 1234, other classes conducting testing	Short
12 Stereo Microscopes	WOOD 1234, special study; provide more student access to microscopes	Short
Dual Axis Force Plate (2)	WOOD 3314, WOOD 5324; physical demonstrations, biomechanics,	Short
V20 Nail Kicker by Reconix (2)	WOOD 3324, Deconstruction; disassembly of wooden structures, preparing bioenergy sources	Short
High End (Ergonomic) Safety Harnesses (2-4, possibly different brands, quality)	WOOD 3314,WOOD 4984 (DWS), safety training; demonstrate use/quality of different safety harness	Short
Vermeer HG200 Portable Grinder	WOOD 3324, Deconstruction, Bioenergy generation source	Short
Packaging Systems & Design		
Packaging Systems & Design	Teaching Purpose	Short/Long Term Need
3D Scanner	Accelerate the primary package and product design	Short
Texture analyzer and/or MTS 250 lbs load cell	Testing various mechanical properties of packaging products and contents	Short
Rapid Prototype maker	Rapid prototyping and primary packaging design concepts	Short
Gas Permeability Tester (O₂, H₂O, CO₂)	Studying the interaction between packaging materials and products	Short
Digital printer	Package design concepts, printing and labeling studies	Short
Bench top Extruders (single/ twin screw type for casting or blown film)	Primary units for Packaging polymers and production areas	Short
Digital Micrometer	Measuring the thickness	Short
Vacuum sealer	Producing Vacuum packaging system	Short
SolidWorks CAD program	Accelerate the product design	Long

Controller for the vibration table	The current controller barely works	Long
Hot seal maker	Study of sealing effect of packaging materials	Long
UV/Visible/Fluorescent/Chemiluminescent spectrometers	Designing smart packaging sensor for Food packaging	Long
Melt Index/Rheometer	Understanding of viscosity of plastic polymers	Long
Colorimeter	Measuring the optical transparency	Long
Bench top Injection /Blow molding machines	Understanding of rigid plastic packaging productions	Long
Newer HPLC/ GC-MASS spectrometer	Analyzing various physical properties of packaging materials and system	Long
DSC/DMA/TGA/TMA	Understanding of thermal properties of packaging materials	Long