

CMEC Alumni & Friends Newsletter

Tom Maloney, Editor
Judy Edmister, Associate Editor

Comments from the Editor



Tom Maloney

The Composite Materials and Engineering Center continues to move on quite well considering the tough economic environment. Washington State University as well as all state agencies had significant budget reductions in state allotted funds. The Center did not have its state allotment reduced as was reported to me, "It is the most productive unit in the College of Engineering and Architecture" -quite a compliment for all of those involved in the Center. However, the battle for outside funds continues as it has for the past 60 years or so. The reputation for doing good work and getting the jobs done on time gives the Center a head start in obtaining new or continuing outside support.

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In case you have forgotten, there has been a reorganization, or enhancement of the Wood Materials and Engineering Laboratory into the new Composite Materials and Engineering Center. Remember to change your book mark to www.cmec.wsu.edu.

And finally, please let us know about your career, family, friends, adventures etc. I believe your friends who receive this Newsletter would be delighted to know about you. I know I like to hear about everyone-you are all our family.

Alumni Spotlight: Joe Zeeben



Photo of Joe and family receiving the Distinguished Alumni Award

Joe Zeeben, Carmen Zeeben Bos, Jake Zeeben Bos, Sharon Zeeben, Lindsey Marie Bos. Carmen is Zeebens' oldest daughter and Jake and Lindsey are Zeebens' grandchildren.

I enjoy learning of the successes of our Alumni and we are continuing to highlight their careers in this Newsletter. Joe Zeeben is spotlighted. Joe is an individual who, I believe, most of our readers have never met. Joe obtained his M.S. degree in Mechanical Engineering in 1960. But his work as a Graduate Research Assistant was with us and his thesis was done in what was then the Wood Technology Laboratory. The title of his thesis was "Thermal Conductivity and Diffusivity of Flakeboards." Joe feels that his research may be of interest today because of all of the efforts to save energy. Joe worked with us as a key person starting up the Nondestructive Testing Program that became one of the strengths of the Laboratory.

In 2008 Joe attended the Golden Grad celebration of 1958 WSU graduates (both he and his wife Sharon earned their undergraduate degrees in 1958). In visiting with Joe, he reminded me about how we got the early instrumentation for the NDT work, as funds for equipment were very limited. What was done, and Joe was a key part in this operation, was to buy a number of electronic kits (we had supply money and the kits fit the description of supplies). Then each of us was given a kit to build on our evenings and weekends, supposedly happily. This is how we got our first instruments, some of which through my and Joe's faulty recollections were: signal generator, volt ohmmeter, audio amplifier, frequency counter, and perhaps condenser checker, capacitor meter, impedance bridge, and transistor tester. I can't remember if anyone of us built our first oscilloscope (it was probably beyond our capabilities). Most of these were Heath-

(Continued on page 2)



Joe Zeeben (left) at Tom and Donna's wedding-1960

## Alumni Spotlight: Joe Zeeben, cont'd

kits, very popular at the time. The company no longer sells kits.

I asked Joe about his recollection of the NDT operation that was our first foray into using vibration for NDT. His edited response was:

"I think we bought kits for most of the apparatus for nondestructive testing. A signal generator and an audio amplifier was used to drive the hi-fi speaker horn that vibrated the test specimen. We picked up the frequency with a photo cell and measured the signal strength with an auto ranging voltmeter. I distinctly remember the voltmeter because it had to be recalibrated often. We also had a frequency counter. Initially we had problems, as 16 cycles per second were displayed on the counter when the very large air compressor next door vibrated the whole building. It took two truck tire inner tubes filled with air to damp out the unwanted measurement. I got the inner tubes at the motor pool (no charge)."

Joe is a certifiable genius. When he graduated he went to Boeing where he worked for 34 years. This past August he was given the Distinguished Alumni Award by WSU. The full story on the award follows:

"On August 6, 2009, Joe P. Zeeben ('58, '60) received the Washington State University Alumni Association (WSUAA) Alumni Achievement Award. The award is the highest honor bestowed by the WSUAA, and recognized Zeeben for his outstanding accomplishments in aerodynamics engineering. Since 1970, only 477 alumni have received the award (Editor's note: there are about 250,000 WSU graduates). Washington State Representative Sam Hunt presented the award on behalf of the WSUAA.

Zeeben earned BS and MS degrees in mechanical engineering from the College of Engineering and Architecture. His strong drive for achievement was apparent at WSU, where he earned varsity letters in cross country, track, and boxing, and served as track co-captain. Additionally, he was a PAC-10 Scholar Athlete and belonged to several academic honor societies.

After graduation, Zeeben began a productive 34-year career at Boeing, where his work in propulsion research, preliminary design, and data management made him indispensable to the commercial airplane group and the military airplane group. Nominator Thomas M. Maloney calls Zeeben one of "the best engineers ever to graduate from WSU".

At Boeing, one of Zeeben's first projects was the design of performance data for engines using a matrix of thermodynamic variables. His expertise enabled him to play a key role in the development of propulsion system technology for advanced military aircraft. His work was essential to the engine selection process for launching the 747 program.

In response to global environmental concerns, Zeeben and his team also developed a simplified method for the calculation of engine emissions, using information about the basic physics of air compression. Zeeben was known for developing these complex correlations by hand on graph paper. The correlations have since been adopted by the FAA and were used at Boeing in the development of global aircraft emissions data for NASA.

While at Boeing, Zeeben was honored with the 30-year Service Award and a Cost Saving Award. His past volunteer service includes coaching youth soccer and basketball, refereeing youth soccer, and serving as Soccer Club vice president. He was awarded the PTA Golden Acorn Award and the Boy Scout Golden Beaver

Award for his service with those organizations.

The award presentation took place at the annual WSU Bob Lundgaard Memorial Picnic held on the grounds of the Schmidt House, Olympia, Washington."

Joe's wife, Sharon is also a WSU graduate, earning her degree in Home Economics Education. She taught in Colton, Washington while Joe was getting his master's degree. She later worked in a pre-school, for the King County Election Department and for the Renton School District.

They have three children, Carmen (computer scientist), Joe (mechanical engineer) and Wendy (pediatrician). Carmen and Mike Bos just celebrated 25 years of marriage and have two children, Jake and Lindsey. Joe works for Kimberly Clarke and he and his wife, Lisa Palmer, live in Tennessee. Wendy is a pediatrician, working on Bainbridge Island. She lives in Poulsbo with her husband Rob Hawley and 2 children, Ruthie and Joe. Joe and Sharon live in retirement near Shelton, Washington (I believe because it is close to nature and more importantly—fishing).

## Graduate Student Spotlight: Yi Wang



Yi Wang

Yi Wang joined the Composites Center in 2007 as a Graduate Research Assistant to pursue his Ph.D. in Civil Engineering. He was born in Gucheng, China. His parents are now retired and they enjoy hiking and dancing with their friends. His younger brother now works in the local transportation office. Yi's wife was an interior designer in China and he claims she is good at cooking. We will accept his

word on this statement. Perhaps the Center will get some samples of her cooking.

His advanced education started at the Nanjing Forestry University, Nanjing, China from 1995–1999. He graduated in Wood Science and Technology.

He then worked in industry from 1999-2002 at a furniture company in China. His work entailed several aspects in the company including: technician, marketing manager assistant, and new product development. He also worked on new production line configurations, product planning & control.

He then decided to continue his education at Nanjing Forestry University where he studied from 2002-2005. He earned his M.S. in Wood Science & Technology. His thesis topic was "Bamboo Cutting Chip Formation in Knot Area."

(Continued on page 3)

## Graduate Student Spotlight: Yi Wang, cont'd

Yi then moved on to Oregon State University from 2005–2007, receiving an M.S. degree in Wood Science & Engineering. His thesis was on “Morphological Characterization of Wood Plastic Composite (WPC) with Imaging Tools.”

When he was studying at Oregon State University, he had a chance to travel to WSU to attend a joint seminar for students from Oregon State University, Washington State University, and the University of Idaho in September 2006. He was very impressed with the facilities of the wood laboratory at WSU, which led to his interest in pursuing a Ph.D. at WSU.

Consequently, after obtaining his M.S. from OSU he entered the civil engineering program at WSU. His background in wood science and engineering and previous research experience fit in well with the program at CMEC. The following is Yi's discussion of his current research work on the thermal forming of strand wood composites.

“There is an urgent need to develop an environmentally benign manufacturing process to mitigate numerous environmental impacts ranging from hazardous forest fires to climate change to efficient natural resource utilization. Thermoforming of profiled wood-strand composites is an efficient way to utilize limited and changing forest resources for non-structural or structural applications.

Roll forming is proposed as the thermal forming technique in this research. Roll forming is a profile manufacturing operation in which a sheet of material is formed into a desired shape by feeding it through consecutive sets of roll stations each imparting an incremental amount of deformation until the prescribed cross-section profile is produced.

The long-term objective of this research is to develop processing methodology for roll forming profiled wood composites starting with discontinuous elements, namely wood strands. This objective

will be addressed in three consecutive research stages.

In the first stage of this research (now completed), a hybrid adhesive composed of phenol formaldehyde (PF) and poly(vinyl acetate) (PVAc) was used to manufacture profiled composites using high moisture content (MC) wood-strands. The cure kinetics of PF/PVAc hybrid adhesive was examined using dynamic and isothermal DSC measurement. It was found that PF/PVAc ratio of 1:1 or lower can be used for profiled wood-strand composites without concerns about significantly changing resin cure kinetics. (Editor's Note: This work was presented at the 43<sup>rd</sup> International Wood Composites Symposium and at the 63<sup>rd</sup> Forest Products Society Conference—both in 2009).

Currently, I'm working in the second stage of the research. The task is to determine and optimize wood strand mat characteristics for preparation for the subsequent manufacturing steps and design mat architecture to produce a product with consistent quality. The strand mats with discontinuous constituents will be pre-pressed with hybrid adhesive to study the effects of varying processing factors on partially- and fully-consolidated mat characteristics. Relatively wet strands provide moisture for forming and reduce drying energy consumption.

The third stage of the research is to determine formability limits and evaluate shape conformance of developed wood-strand mat. Single-curvature V-bending tests will be performed to establish the limits of fold angles in relation to sheet thickness. Effects of strand geometry and orientation on ability to bend plies for shape development will be studied. Thermal and moisture influence on shape conformance will be evaluated.”

Yi expects and hopes to have his research completed in 2010. The Editor is amazed and pleased at the quality and content of his and all of the graduate students' research as they pursue their advanced degrees through the Composites Center.

## Faculty Focus: Vikram Yadama

Our readers know that in each issue we are introducing current faculty members. I should say, that we are introducing faculty members to those of you who have not had the opportunity to visit the Center in recent years while also providing those of you who have met the faculty member featured with all of the individual's biographical information. In this issue it is my pleasure to focus on Dr. Vikram Yadama. As will be noted, he is continuing our work on composites and the International Wood Composites Symposium—both of which I enjoyed working on for 40 years.

Vik is married and has two children. His wife's name is Minie, his 16 year old son's name is Roshan, and his daughter Alexa is 11. He was born in Hyderabad, India. His father worked for the Indian Forest Service and later for the Food and Agricultural Organization of the United Nations (FAO) in Rome and Bangkok, Thailand. Vik states that he developed his liking for trees and wood as a material because of his father.

Vik was kind enough to provide me with his career autobiography, which follows. It is obvious to me that the Center chose wisely in selecting Dr. Yadama as part of the Center's outstanding research, teaching, and extension team.



**Vikram Yadama**

Dr. Vikram Yadama, Assistant Professor and Extension Specialist, joined the faculty of Washington State University's Wood Materials and Engineering Laboratory in 2003. Vikram has a dual appointment of research and extension within the Department of Civil and Environmental Engineering and WSU Extension.

His educational background spans the fields of forestry and forest management (B.S. from Iowa State University), forest products and wood science (M.S. from Virginia Tech), and structural engineering (Ph.D. in Civil Engineering from Washington State University).

Vik has extensive experience as a project leader in extension and applied research gained at Mississippi State University, where he held a research faculty position at the Forest Products Laboratory for approximately ten years. In this capacity, he interacted frequently with the wood-based composites industry and furniture manufacturers, providing them with technical assistance.

## Faculty Focus: Vikram Yadama, cont'd

He is an active member of the Society of Wood Science and Technology and the Forest Products Society. His areas of interest are wood-based composites processing and product development and improvement, structure and property modeling, and material properties evaluation. His research focuses on reducing material wastage, energy consumption, and emissions.

His research involves developing more durable wood-based composites without using toxic chemicals and investigating alternate composite manufacturing processes to economically produce stronger and more durable wood composites. His research also examines utilization of low-value and under-utilized fiber resources such as small diameter timber, wood residues, and insect-damaged wood to produce value-added composites for non-structural and structural applications.

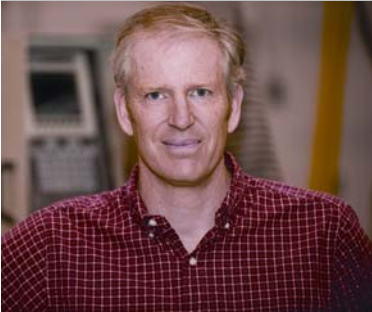
He is actively researching ways to produce high strength and high modulus thin (3-4 mm) strand veneers and light weight strand-laminates from small diameter timber. A preliminary study to assess the feasibility of forming manageable network of discontinuous wood strand mat and consolidating it into a net shape composite indicates that stable shape conformance can be

achieved even with discontinuous strands as they behave more homogeneously resulting in a balanced mat architecture.

He and his students are researching forming limits of strand-based composites to understand the materials and manufacturing aspects in regards to producing profiled strand composites to minimize material and resin consumption. Development of thin-walled 3-D cores using wood strands that was initiated in collaboration with Dr. John Fujii, a private entrepreneur, has resulted in stiff and strong yet light-weight sandwich panels while reducing wood and resin consumption by over 60% compared to OSB panels.

He is co-chair of the annual International Wood Composites Symposium and Technical Workshop ([www.woodsymposium.wsu.edu](http://www.woodsymposium.wsu.edu)) that has been organized and hosted by WSU for the last 43 years. It is an industry-driven forum for producers, suppliers, and researchers of natural fiber composite panels and engineered natural fiber products to exchange ideas, discuss new developments and network with leaders in the forest products industry from all parts of the world.

## Institute for Sustainable Design—An update by Mike Wolcott



Mike Wolcott

As Tom mentioned in his Spring '09 issue of this newsletter, WSU has launched a major new effort in the area of Sustainable Design. With the gracious financial aid of the Weyerhaeuser Foundation and others, the Institute is just now completing its first year in existence. As with any start-up, it's been hectic and exhilarating.

At times it feels more like we are simply putting out fires but now that the pieces are falling together, we can begin to see the potential of this new venture.

The public face of the Institute began last year with a WSU Innovators lecture [1] in Seattle. It was in conversations with this collection of the Pacific Northwest's business and thought leaders that the gauntlet was laid down.

*How can the Institute develop and drive inspiring construction projects that push our concepts of sustainable infrastructure?*

While challenging and visionary, this direction was hugely intriguing. And we knew that to be successful at such a goal, it would take a truly collaborative effort. We needed to form seamless teams that draw from the rich experience in the private sector, the vision of our community leaders, and the knowledge of our universities. That, in fact, we may have to reach outside WSU to allied universities to capture experience we lack. This path was clear because of the lessons learned from our long-time experience with the US Navy projects, which after more than a decade, have finally been completed just this month.

Our first step on this road was to devise a mechanism to integrate our teaching and research missions into real build-out projects for communities. To do this, we needed to develop essentially a "design firm" inside the university. And this firm needed to engage teams of students, faculty, and firms in all the allied disciplines; architects, engineers, materials, users, and construction. IDeX (Integrated Design Experience) sprung from this notion of collaboration. We won sponsorship of the idea through the Engineering Education program of the National Science Foundation (NSF). In addition, we launched an allied Sustainable Design focused MS program as a way to bring a higher level of student expertise into the project and transition our design ideas into research.

We are currently in our first IDeX project, a re-design of WSU's Organic Farm with a challenge to make it resource neutral. We've taken up the challenge of producing healthy food while subsisting off all our own water and energy needs. In addition, our vision will expand the farm operations to include office space, utilities, residences, and collaborative spaces. Our project is named smart-FARM, drawing from the notions of networked decentralized services that will enable the nation's emerging Smart Grid we hear so much about.

So what does all this have to do with Wood Materials and Engineering?

Our vision of networked decentralized services reach past electronics and power distribution and speak to the very design of our buildings; modular units with adaptable, pre-engineered components and materials that will enable architects' vision of building form, accommodate passive and active energy strategies, increase value to the owners through adaptable designs that change with

## Institute for Sustainable Design, cont'd



First IDex Project: smartFarm

the owner's needs, and above all, are affordable. So as materials designers and structural engineers, our challenge is to design new modular systems to facilitate the buildings of the future. These systems will build upon the many modular building components that exist today. Our concepts are to utilize pre-engineered components like shear panes, i-joists, and trusses. But we will need to reach further to combine them with concepts of panelized and modular construction to produce novel schemes.

As a wood scientist at heart, I have always been frustrated that our profession and the exemplary efforts of our industry to achieve high levels of sustainability go unnoticed. One conclusion from my sabbatical study is, that as a profession, we need to step out of our box and participate in the larger world moving the built environment. We need to become more fully a part of the leadership to push the nation's vision and that vision cannot simply be: build it out of wood. Instead, we need to transition the ideas of energy efficiency, water conservation, and industrial ecology that are so well developed in the forest products industry and apply them to larger parts of society. And to accomplish this goal, we need to move beyond ourselves to engage and lead allied professions.

We are excited and challenged by our new vision and welcome you all to become a part of our mission.

[1] Wolcott, MP. 2008. Strategies for Tomorrow: Re-Engineering for a Sustainable Built Tomorrow. The Rainier Club, Seattle, WA. <http://theinnovators.wsu.edu/oct9/default.aspx>

## Where are they now? Lucille (Sam) Leonhardy



Lucille Leonhardy

thought that she was too severe in her editing. I would then take out one of my red lined papers and show them that she did the same thing to me.

Having a dedicated editor can have a great impact in getting more productivity out of the work being done. It is also good to have someone notice your errors before the document leaves your office. I always told the students that all of us need the help of editors and not to take any suggestions as demeaning to their work. The automatic response that most of us have to any editing of our work is the same as "Killing your baby." You have to learn to exist with editors.

Sam took time away from her recent hard work of canning, splitting wood, and other such pioneer endeavors. Here is her report:

"Lucille Leonhardy, really known as Sam, has been very very busy since retiring from the Wood Materials and Engineering Laboratory about 14 years ago. She read books for a couple of days, slept in for a couple more days, cleaned house for a couple of days, and then moved to Moscow.

Recently I asked Sam for a report on her activities since she retired from the WMEL. Sam was a valuable assistant to me over the years as I am a challenged writer and she took "Great Delight" in correcting my writing. I also had her work with graduate students and their writing and she will attest, as will most of them who worked with her, that she made them do their very best in writing. Some of these students would come to me in shock showing me the red lined corrections of their paper or thesis first draft. They

thought that she was too severe in her editing. I would then take out one of my red lined papers and show them that she did the same thing to me.

Having a dedicated editor can have a great impact in getting more productivity out of the work being done. It is also good to have someone notice your errors before the document leaves your office. I always told the students that all of us need the help of editors and not to take any suggestions as demeaning to their work. The automatic response that most of us have to any editing of our work is the same as "Killing your baby." You have to learn to exist with editors.

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During her time in that beautiful and friendly community, she has used her then newly acquired Substance Abuse Certificate and worked as a counselor for a little over a year. She joined the United Way of Moscow/Latah County Board and was very active with that group for three years. She then became their temporary Secretary for another year. In the meantime, she joined the Moscow Meals On Wheels board and was very active with that group for five years. She was also a VISTA volunteer in Moscow for a year. AmeriCorps VISTA (Volunteers in Service to America) is a program for fighting poverty.

In between all of this community work, she moved in Moscow two times, giving her sons (one at a time) and their families the duplex she was living in. She then moved out into the country with a room mate who owns a neat house and lots of area (5 acres just to mow) and has been there ever since. The work load increased when she and her room mate decided to go out to the forest, fell trees, delimb the logs, cut them up, and haul them back to the house. Then the fun began by cutting the longer pieces of wood into correct firewood lengths and using a log splitter. They split at least 4-5 cords of wood for each year she has been living out there. (Editor's note: If I had known about her logging skills we could have put her to work doing a lot of the grunt work out in the laboratory).

She co-invested in a Recreational Vehicle (RV-36 feet long, gas engine) and took a trip to Moline, Illinois to surprise her oldest son on one of his birthdays. The RV has been a source of fun and delight for nine years. Needless-to-say, with the gas prices and the economy problems, the RV has NOT been used much in the last couple of years. She thinks often of her time at WMEL with great gladness that she was able to be part of such a tremendous organization. She made many friends at WMEL and wishes to extend a warm hello to those out there who are still alive and remember her!!!!"

## 2010 IWCS



Red Lion Hotel on 5th Avenue

Seattle Washington USA

March 29-31, 2010

[www.woodsymposium.wsu.edu](http://www.woodsymposium.wsu.edu)

[View Symposium Flyer](#)

Featuring keynote speaker **Lynn O. Michaelis**  
President,  
Strategic Economic Analysis, LLC

"Road to Recovery for the Global Economy:  
Looking for Potholes!!"

## Alumni, Staff and Friends News



Sam Leonhardy receives the 1997 Distinguished Service Award from Tom Maloney.

## Alumni, Staff and Friends News



Does anyone remember this particleboard project??



"What do you mean that's the last of the Cheerios, Grandma?"

Photo of Trenton Anders Nilson, submitted by proud grandparents Phyllis and Tony Nilson (featured on Page 2 of the Moscow-Pullman Daily News, Oct 12, 2009.)

*Identification of the WMEL staffers in Issue 4:* Christina Rockett and Linda Villett—two super people in the position of what is now known as Principal Assistant. They were critical in keeping Tom doing the right thing!



Composite

PO Box 641806  
Pullman WA 99164-1806

Phone: 509.335.2262  
Fax: 509.335.5077  
[cmece.wsu.edu](http://cmece.wsu.edu)