Expert Advice at 2010 Student Achievement Day

Students affiliated with the University of Delaware Center for Composite Materials heard some important messages on May 28: Think possibilities, not boundaries. Your education doesn't end here; it's just beginning. Determination and competencies are just as important as technical skills.

And, last but certainly not least: Develop an "elevator speech."

University of Delaware
Center for Composite Materials

COMPOSITES UPDATE
June 2010

The messages came from a panel of six experts working in the composites field for small and large companies and government agencies. The panel discussion was part of the Center's Student Achievement Day attended by more than 80 students, family members and faculty and staff. The event also featured a poster session, brief research presentations, and student awards.

"The best part was probably the two-minute elevator talks from the students on each of their research topics and the social time that followed," said Conor Keenan, a Ph.D. student in materials science. "I think this was an excellent way for students to quickly give a general overview of their work."

That approach was right in line with the recommendation made by Kurt Kuhn, Engineering Manager with **the Boeing Company**. "I can't stress enough the importance of communication, of being able to communicate your work to others," he said.

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TOP STORY (Continued)

Solange Amouroux-Berthe, Composites Process Engineer for **Dassault Aviation**, emphasized the importance of of having multifunctional, interdisciplinary experience. "We have to be able to do some mechanics, some chemistry, a little bit of everything," she said.

Prashant Karandikar, Director of R&D for **M Cubed Technologies**, pointed out that there is always a compromise between where researchers might like to take the science and where the company needs to go in order to make money.

However, individuals do have the potential to chart their own course within organizational constraints. "A lot of how your job goes is up to you and where your interests lie," said Maureen Foley, Materials Engineer at the **Naval Surface Warfare Center.**

Ashish Diwanji, Vice President of Innovation for Owens Corning Science & Technology, presents an overview of his company.

"Your knowledge base is important," she added. "It teaches you how to approach a problem." Foley pointed to the Navy's use of the building block approach in composites design, which she learned at CCM.

Prashant Karandikar, Director of R&D for M Cubed Technologies, and Maureen Foley, Materials Engineer at the Naval Surface Warfare Center look on as Rob Jenson shares his perspective.

"The fundamental science that you learn in your graduate work is key to your ability to get from point A to point B," said Rob Jensen, Leader of the Adhesives and Interfaces Research Team at the **Army Research Laboratory**. "That knowledge enables you to skip steps in the process—not randomly but in a way that makes sense."

Teamwork was another critical competency mentioned by the panelists.

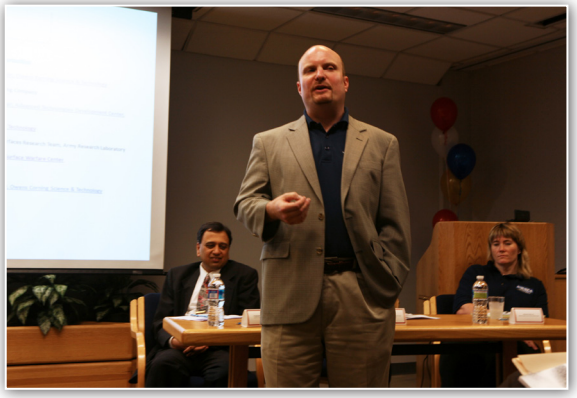
"There's a big disconnect between what you learn from textbooks and what you're expected to do and know in the workplace," said Ashish Diwanji, Vice President of Innovation for **Owens Corning Science & Technology.** "In the real world, you have to work with not only other scientists and engineers but also with people in sales, marketing, production, and other areas."

TOP STORY (Continued)

Boeing's Kuhn concurred. "I've seen teams do really amazing things when they gel," he said.

Student attendees found the panel discussion to be extremely valuable. "Oftentimes, students are so wrapped up in the world of academia that it's hard to understand how different things can be in industry," Keenan said.

"The discussion was a great opportunity to hear what is important in looking for a job," said Kevin Ayotte, a senior mechanical engineering major. "It was unique because we got to hear this advice from company executives rather than from representatives at a job fair."



Kurt Kuhn, Engineering Manager, The Boeing Company

In addition to career advice, the panelists shared information about the technical directions in which their organizations are moving. While the applications range from armor products and precision machining to aircraft and ship structures, there was a common theme in how well the presenters' education at CCM had prepared them for their current experiences.

"When I entered the composites field, I quickly realized that the science I had learned at the University of Delaware was being applied throughout the industry, from automotive to wind to chemicals," said Diwanji.

"The amount of experience in composites that I came out of Delaware with after earning my bachelor's degree immediately put me on a par with others who had advanced degrees," added Kuhn.

Betty Wolf, Business Planning Process Leader, Owens Corning

In addition to the panel discussion, attendees heard a short presentation on Owens Corning's global competition to find the next big applications for composite materials in four areas: infrastructure durability, fuel efficiency, renewable energy, and protection from harm. Three $10,000 awards have been reserved for university student entrepreneurs.

"Your idea could help address a pressing issue in one of the four categories," said Betty Wolf, Business Planning Process Leader for the company. "Your idea could transform the composites industry." Some 40 students displayed research posters, with about half also giving brief presentations on their work.

"The amount of experience in composites that I came out of Delaware with after earning my bachelor's degree immediately put me on a par with others who had advanced degrees," added Kurt Kuhn of Boeing.

Click for details

TOP STORY (Continued)

"The poster session and presentations provided a nice opportunity to see what projects everyone else is working on, which really helps to bring everyone together," said Cedric Jacob, a Ph.D. student in mechanical engineering.

Junior mechanical engineering major Maxime Dempah agreed. "Being able to present my research work to professionals and discuss it with them was great, and it also gave me the opportunity to learn about similar research ongoing in their industries and how the work could be used in real-life applications."

Members of the panel judged the posters and selected the following winners:

- First place – graduate student: Gaurav Nilakantan, MSEG, *Modeling the Impact of Flexible Textile Composites Through Multiscale and Probabilistic Methods*
- First place – undergraduate student: Sarah Friedrich, MEEG, *Processing and Electrical Characterization of Nanocomposites for Damage Detection in Composite Joints*
- Second place – graduate student: Joseph Stanzione III, CHEG, *Observing the Twinkling*
  Fractal Theory (TFT) of the Glass Transition
- Second place – undergraduate student: Maxime Dempah, MEEG, *Processing and Characterization of Nanotube/Fiber Hybrid Composites for In-Situ Damage Sensing Applications*

TOP STORY (Continued)

(back row) Asst. Prof. Erik Thostenson, Joe Deitzel, Nikhil Sharma, Prof. Richard Wool,(middle row) Prof. Jack Gillespie, Jr., Cedric Jacob, Maxime Dempah, ,Liang Qiu, John Gangloff, Gaurav Nilakantan, Vasan Chandrasekaran, Prof. Suresh Advani (front row) Conor Keenan, Amanda Lim, Erin Phillips, Sarah Friedrich, Joseph Stanzione III

The following center-affiliated students and researchers also received awards at the event:

- Amanda Lim – Roy L. McCullough Scholars Award
- Vasan Chandrasekaran and Joseph Stanzione III – CCM Progress Award
- Liang Qiu and Nikhil Sharma – CCM Achievement Award
- Erin Phillips and Nicholas Morrisey – CCM Outstanding Senior Award
- Sarah Friedrich, Zachary Melrose, and Cara Watson – CCM Undergraduate Research Award
- Ahmad Abu Obaid – CCM Scholarship Award
- Cedric Jacob, John Gangloff, Conor Keenan, Maxime Dempah, and Gaurav Nilakantan – CCM Directors' Award

Article by Diane Kukich

OTHER NEWS

CCM students win award for leadership in professional organization

When the University of Delaware Center for Composite Materials held its annual awards ceremony on Friday, May 28, five students stepped forward to accept the Director's Award. While the award recognizes outstanding personal growth demonstrated by a center-affiliated employee or student, the 2010 winners are best known for their teamwork in growing a professional organization at UD.

Cedric Jacob, John Gangloff, Conor Keenan, and Max Dempah are all officers in the UD student chapter of the **Society for the Advancement of Material and Process Engineering (SAMPE)**, and Gaurav Nilakantan is the chapter's webmaster.

Together, the five have distinguished themselves as leaders and enabled their fellow students to reap the many benefits of SAMPE participation, including hands-on competitions, networking, mentoring, access to career opportunities, and the chance to present their work in a professional arena.

(from left) Prof. Suresh Advani, Conor Keenan, Maxime Dempah, John Gangloff, Cedric Jacob, Gaurav Nilakantan, Prof. Jack Gillespie

"The SAMPE chapter leadership team did a phenomenal job of promoting membership, activities, and overall interest in composites this year," says CCM Director Jack Gillespie, who is also Donald C. Phillips Professor of Civil and Environmental Engineering. "Enrollment of students in two of our core composites courses—one focused on processing and the other on materials—doubled this year, and the feedback we're getting is that this increase is related to student interest in SAMPE activities."

SAMPE sponsors annual student competitions in lightweight bridge and aircraft wing design, and ten CCM-affiliated students traveled to Seattle in May to attend the conference and trade show and participate in this year's event. Half of the UD entries placed in the top three, one entry took a first-place award, and the teams brought home more than $1100 in prize money, which will be used to support next year's activities.

OTHER NEWS (Continued)

"With all of the resources we have in this building, including faculty expertise and physical facilities, we should be even more competitive in the future," says Conor Keenan, chapter secretary and a Ph.D. student in materials science and engineering.

According to Gangloff, chapter vice president and a Ph.D. student in mechanical engineering, the SAMPE student chapter members at UD have traditionally been graduate students, but a recent concerted effort to recruit undergraduates has resulted in a significant increase in their participation. This year's slate of officers even included an undergrad—Dempah, a junior mechanical engineering major, served as chapter treasurer during the past year.

"SAMPE gets grads and undergrads talking to each other, and it gets both groups talking to industry," Gangloff says. "It's also a great motivator for undergrads when things start to click for them—they see how what they're learning in the classroom can be applied to an actual design project, and then they get feedback on that project from industry. Many of the current cutting-edge technologies in areas like energy, sports equipment, and biomedical applications are directly connected to advanced composites, and SAMPE ignites excitement about these materials in students who previously knew nothing about them."

Jacob, chapter president and also a Ph.D. student in mechanical engineering, joined as an undergrad and says that SAMPE not only got him involved with composites but also motivated him to go on for an advanced degree.

"The best part for me" he says, "is seeing new students join us in the fall, never having heard about composites. Nine months later they're on a showroom floor at the SAMPE meeting, head-to-head with people from industry discussing why their bridge entry failed. It's an amazing learning opportunity for them."

The chapter also participates in pre-college outreach activities, including the Space Beam Challenge sponsored by the Delaware Aerospace Academy.

"These hard-working and dedicated students deserve much credit not only for their achievements at the annual SAMPE meeting but also for their contributions to the larger community, where they help to generate interest in science and engineering," says Michael Vaughan, senior assistant dean for academic affairs in the UD College of Engineering.

While SAMPE chapter participation to date has been largely from the Department of Mechanical Engineering, Jacob hopes to recruit students from all UD engineering departments as well as other disciplines like business.

"We want to be an organization that everyone in engineering wants to be part of," he says.

Article by Diane Kukich

OTHER NEWS

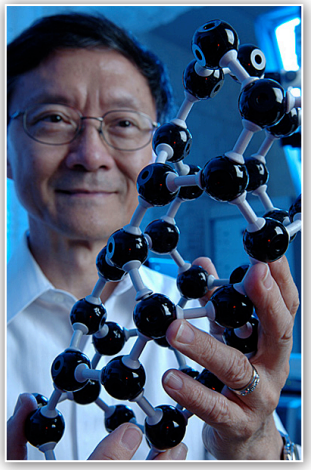


Photo courtesy of UDaily

UDaily: Chou speaks at University of Limerick as Distinguished Lecturer

12:39 p.m., June 4, 2010----Tsu-Wei Chou, Pierre S. du Pont Chair of Engineering at the University of Delaware, recently delivered two talks at the University of Limerick in Ireland as part of the Materials and Surface Science Institute (MSSI) Distinguished Lecture Series.

Photo courtesy of UDaily

UDaily: Kiick group research highlighted in special polymer science series

1:02 p.m., May 28, 2010----Research conducted in the group of Kristi Kiick, associate professor in the Department of Materials Science and Engineering at the University of Delaware, has been highlighted in a special series in Macromolecular Rapid Communications, one of the leading journals in the field of polymer science and one of the top five journals publishing original research in this area.

UDaily: Nearly 3,000 attend Forum and Reunion Weekend

Editor's note: For slide shows or to order photos, visit the special **Forum & Reunion Weekend website.**

4:35 p.m., June 7, 2010----Nearly 3,000 alumni, faculty, family, friends and future Blue Hens flocked to the University of Delaware this weekend for the second annual Forum & Reunion Weekend.

"It was a fantastic celebration all the way through," said UD President Patrick Harker. "This weekend has become such a great way for alumni to reconnect with the University and with old friends. It's a terrific time to be at UD, and events like our growing Forum & Reunion Weekend make it even more exciting."

NEW PUBLICATIONS

Journals

Nilakantan, G., M. Keefe, T.A. Bogetti, R. Adkinson, and J.W. Gillespie Jr., "On the Finite Element Analysis of Woven Fabric Impact using Multiscale Modeling Techniques," International Journal of Solids and Structures, 47, pp. 2300-2315, 2010.

Kusoglu, A., A. M. Karlsson, and M. H. Santare, "Structure-Property Relationship in Ionomer Membranes," Polymer, 51 (6), pp. 1457-64, 2010.

Kusoglu, A., Y. Tang, M. Lugo, A. M. Karlsson, M. H. Santare, S. Cleghorn, and W. B. Johnson, Constitutive Response and Mechanical Properties of PFSA Membranes in Liquid Water," Journal of Power Sources, 195 (2), pp. 483-92, 2010.

Conferences

McAllister, Q. P., J. W. Gillespie, Jr., M. R. VanLandingham, and K. E. Strawhecker, "Exploring Particle-Fiber Contact using Instrumented Indentation and Atomic Force Microscopy," SAMPE 2010, Seattle, WA, May 17-20, 2010.

Nilakantan, G., M. Keefe, E. D. Wetzel, T. A. Bogetti, R. Adkinson, and J. W. Gillespie, Jr., "Using LS-DYNA® to Computationally Assess the V0-V100 Impact Response of Flexible Fabrics Through Probabilistic Methods," 11th International LS-DYNA Users Conference, Dearborn, MI, USA, June 6-8, 2010

Nilakantan, G., E. D. Wetzel, R. Merrill, T. A. Bogetti, R. Adkinson, M. Keefe, and J. W. Gillespie, Jr. " Experimental and Numerical Testing of the V50 Impact Response of Flexible Fabrics: Addressing the Effects of Fabric Boundary Slippage," 11th International LS-DYNA Users Conference, Dearborn, MI, USA, June 6-8, 2010

Gama, B. A., K. M. Ayotte, R. Adkinson, and J. W. Gillespie Jr., "Penetration Mechanics of UHMWPE soft Composite Laminates: Quasi-Static and Ballistic Experimental Observations, SAMPE 2010, Seattle, WA, May 17-20, 2010.

Gama, B. A., T. A. Bogetti, and J. W. Gillespie Jr., "Composite Damage Modeling under Quasi-Static, Low Velocity Impact, Ballistic and Blast Loading Conditions," SAMPE 2010, Seattle, WA, May 17-20, 2010.

Kang, S.-G., B. A. Gama, and J. W. Gillespie Jr., "Damage Modeling of Uni-Directional and 3D Composite Unit Cells," SAMPE 2010, Seattle, WA, May 17-20, 2010.

Manzella, A. F., B. A. Gama, and J. W. Gillespie, Jr., "Effect of Laminate Thickness on Ballistic Penetration of Thick-Section Composites," SAMPE 2010, Seattle, WA, May 17-20, 2010.

Celebrating 35 years of significant contributions to composites science and technology, the education of students, and the creation and transfer of technology to industry.

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This is a newsletter publication of the University of Delaware Center for Composite Materials
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