



Mechanical Engineering News

University of Delaware

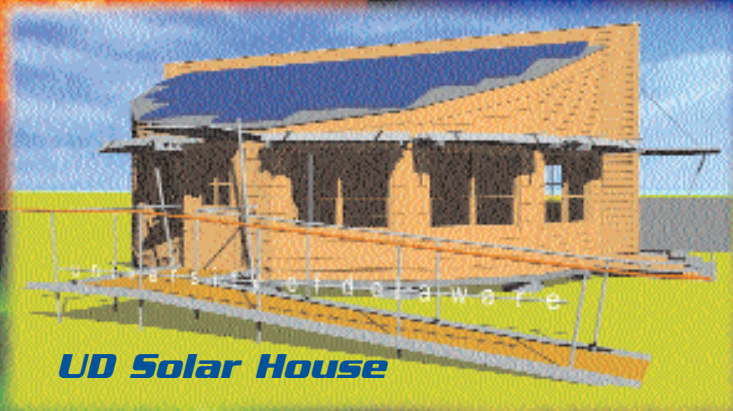
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Solar House Construction Underway



UD Solar House

Inside: Faculty Highlights • Student Profiles • Senior Design • Alumni News

Message from the Chair

Tsu-Wei Chou, with Diane Kukich.



As this issue of ME News was going to press, graduation was rapidly approaching, with this year marking the second graduating class of our ME 2000 program. The curriculum committee continues to work towards ABET re-accreditation and has created a student advisory committee. The key new accomplishment this year in the area of undergraduate education was establishment of the first official concentrations in the College of Engineering, one in biomedical engineering and the other in aerospace engineering. We even have our first graduate with a concentration an undergraduate who has been working with Prof. Buchanan and has the necessary courses for the biomedical engineering concentration.

In the area of graduate education, we have recently revisited our Ph.D. program and made several important changes. The revised curriculum provides greater flexibility to our Ph.D. students, allowing them to start their dissertation research at the onset of their study. At the same time, the revised cur-

riculum maintains the rigor of basic engineering science for our doctoral students. We have had a successful year in recruiting and attracting high-quality graduate students with diverse cultural and educational backgrounds for the Fall 2002 semester.

Also joining us when the new semester begins will be a new faculty member, Dr. Anette Karlsson, in the area of solid mechanics. Dr. Karlsson is currently a Research Associate at Princeton University. We will feature a story on her in the next issue of ME News.

A search is currently underway for another new faculty member, in biomechanical engineering. This an area that is growing very rapidly at the University of Delaware and will continue to develop with the help of major funding from the National Institutes of Health. NIH recently announced the award of a \$6.8 million grant to University of Delaware's Center for Biomedical Engineering Research. Professor Thomas Buchanan is the Director of CBER.

Other major news on campus is the reopening of DuPont Hall after a two-year addition and renovation project. We're very excited about the College of Engineering's new facilities and looking forward to the space ME will gain in Spencer Lab when the Department of Materials Science and Engineering moves into DuPont.

I urge alumni and friends to come back and visit us in Spencer Lab and see some of the exciting things going on in the Department. In the meantime, you can read about many of them in this issue of the newsletter.

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Faculty Focus

Professor Jack Vinson: A Pioneer in Composite Materials

adapted by Diane Kukich from an interview conducted by Tom Frey (BME84 MME90)



Jack R. Vinson, H. Fletcher Brown Professor of Mechanical and Aerospace Engineering, has been teaching at the University of Delaware long enough that his first students are nearing retirement age. But Vinson himself is not ready to retire, despite a career that has spanned half a century and has included stints in the military, industry, and academia. "I enjoy what I do, and there are always new challenges," he says. "It never gets old for me." He is also still writing textbooks—his seventh volume on composite structures is now at the publisher.

Vinson knew in high school that he wanted to become an engineer. "In those days, if you were good at math and physics, it was logical that you became an engineer," he recalls. "I graduated from high school at age 16 in 1946 right after World War II, so engineering was a big thing, and everyone was becoming aware of technology."

He initially wanted to be an aeronautical engineer and went to Cornell on a full five-year scholarship. He switched to mechanical engineering because aeronautical engineering was only a graduate program at Cornell and offered only at the Buffalo campus, not at Ithaca.

After finishing at Cornell with a five-year BME degree, Vinson studied at Cambridge University on a fellowship from 1952 to 1953 and then spent two years in the Air Force. He was an ROTC officer and was called to duty from 1954 to 1956 at Wright Patterson Air Force Base in the Aeronautical Research Laboratory working on high-temperature materials and landing gear dynamics. "In those days," Vinson jokes, "high-temperature meant all the way to 500° F!"

In 1956, he joined GE in Schenectady, New York; when the entire plant moved to the Philadelphia area, Vinson started a Ph.D. program at the University of Pennsylvania. "Everyone at GE was encouraged to pursue advanced degrees," he says. "I had already spent a year at a Kansas City engineering college, five years at Cornell, and one year at Cambridge. I had put in the time, so I wanted that doctoral degree!"

It was in his first year with GE that Vinson, whose name has since been consistently associated with composite materials, actually encountered these novel materials for the first time. "GE was evaluating the feasibility of the first Atlas ICBM," he explains. "In the first flights, they weren't sure the missile would survive re-entry because they calculated that the copper material used in the shield came very close to the melting point. So, to maximize the chance of getting data, they ejected a chopped glass/melamine composite data capsule just before re-entry. This was the

first composite material for aerospace applications."

"In those days, there were only about 150 people in the whole division," he continues. "One of my first assignments was to help analyze what happened during water entry at terminal velocity to this 18-inch spherical shell data capsule. I developed the methods of analysis to predict whether or not it would fail when dropped out of a helicopter at 5,000 feet, and my predictions turned out to be correct."

But Vinson admits that while the aerospace program might have been ready for composite materials, the world wasn't: "My dissertation involved new solution techniques for composite materials," he explains, "but my advisor insisted on calling them 'orthotropic plates' instead. I think that was a bad decision. If I had called them composite materials, it would have become a best seller. But my advisor said that no one knew what composite materials were."

Vinson left GE in the early 1960s to join a startup company called Dyna Structures, Inc. created by a group of faculty at Penn to investigate a new solid propellant rocket motor for the Air Force. "Nobody knew how a 'trash can filled with Velveeta cheese' would operate," Vinson says, laughing.

When one of his colleagues at Penn went on sabbatical in 1962, Vinson taught a course for him at Penn and was bitten by the teaching bug. "I always say teaching is very addictive, so don't try it unless you're prepared to teach full time," he says. "I decided in 1964 that if I was to go for it, I'd better be at a university by age 35." In September 1964, Vinson joined the University of Delaware as an associate professor of engineering mechanics in the civil engineering department. By the next year, how-



ever, he had switched departments, having been offered the position of chair in ME.

"At the time," he recalls, "there were nine full-time professors in the department. When the former chair left, three others left as well. So there were only six including me when I started. We interviewed 37 people in my first year. In the 14 years I was chairperson, we grew to 14 faculty. Now there are 20."

Vinson may have changed departments, but he hadn't changed interests. Within five years of joining the UD faculty, in the fall semester of 1969, he was teaching the University's first course in composite materials. The following spring, Tsu-Wei Chou taught the second one. UD has offered at least one course in composites every year since then. "We decided from the start to always offer a composite materials course to undergraduates," Vinson says. "It's great to have Ph.D.s in composites, but you also need lots of 'Indians.' During the peak year, I think I had over 70 students in one class because it was standing room only in 114 Spencer Lab. The courses are still well attended today."

However, Vinson and Chou didn't want to limit their composites activities to the classroom. "By 1973," Vinson says, "we decided to start a center. I envisioned it as a kind of academic 'sandbox,' to which people could bring their own toys and play. Although we asked for university-wide support, we stressed that the center would not need additional administrative funding. When the Center for Composite Materials was approved in 1974, Arnold Lippert, the Graduate Studies Dean at the time, commented that it was bound for success, since it was the first proposal he had seen that didn't ask for any money."

"Byron Pipes joined us from Drexel in Fall 1974," Vinson continues. "We were pleased because he would make the third leg of the 'composites stool'—represented structures, Tsu-

Wei represented materials, and Byron was the experimentalist. I was the first CCM director, from 1974 to 1978, as well as the ME chairperson. By 1978, it was obvious that the jobs needed to be split. Dean Greenfield appointed Pipes as CCM director, and I remained as ME chairperson."

One of Vinson's main goals for the fledgling center was that it "become a Mecca where people throughout the world could come together for graduate studies, post-doctoral work, and sabbatical leaves," he says. "It would be a true center where people would come to learn about composites and go forth to promote and strengthen the industry. What was brilliant was Pipes's idea to go to industry for funding. He started the Industry-University Consortium, which had 37 members at its peak. Half of their support was for self-directed research. The other half was to support technology transfer such as research reports, symposia, etc. And it is still going strong. In fact, CCM celebrated its 25th anniversary in 1999."

Vinson has always believed that "The Future is Composites," and his current vision of that future comprises a focus on manufacturing, with applications in bridges and ship structures.

"Forty percent of bridges in the US are either structurally unsound or operationally deficient," he points out. "And there isn't enough government funding to replace them by conventional means. So for the first time, we don't have to try to sell composites—people are coming to us. As more bridges are shut down, commuters are going to put pressure on elected officials to do something. They'll turn to the transportation departments, who are then going to look to people in composites for economically feasible solutions. In the American Society for Composites, we have already formed a task force to study the use of composites for bridges and have offered our services to all 50 states. And there are composite bridge applications already in

existence—like the one on Business Rte. 896 in Glasgow, Delaware, which was the subject of Doug Eckel's Ph.D. dissertation. It's the only dissertation I know of that you can drive on!"

"I think that ships, both commercial and Navy, will use more and more composites," he continues. "This will take longer though. Helicopter hangers, ship decks, and masts are all candidates for composite materials. In the USS Radford, there is now a 90-ton mast. It will take longer for the US to accept composite hulls, unlike our friends overseas."

When asked about the changes he has seen in students over the years, Vinson responds, "All of the students today are computer literate and well versed in finite element analysis techniques. I've seen a decrease in the number of U.S.-born graduate students. But conversely, we're able to attract the world's best foreign students. Many of them remain in the U.S., and that is what is keeping our nation in the technology lead."

Retirement? Not yet, anyway. "I really enjoy the team research I've been involved in recently," Vinson says. "I get to work with the best from all over the U.S. and the world. It has many advantages, the whole being greater than the sum of its parts. I plan to continue to teach and do research for as long as it remains enjoyable. And I'm having more fun doing this than ever. I laughingly say my retirement criterion is the second time I can't find my office!"

Editor's Note: Tom Frey earned his master's degree in mechanical engineering under the advisorship of Jack Vinson in 1990. He conducted an extensive interview with Prof. Vinson, which will appear unedited on the ME Website. An alumni profile of Frey appears in this issue of ME News on page 16. Of Vinson, Frey says, "It was an honor to work with an advisor who is a leader in the composites field at a university that is at the forefront of composites research."



Research Program Highlight: Bio-Mechanics Center Grant

NIH awards UD \$6.4 million for ME osteoarthritis research center

The National Institutes of Health has awarded a \$6.4 million grant to the Department of Mechanical Engineering's Center for Biomedical Engineering Research to study osteoarthritis.

The goal of the center grant is to create infrastructure and expertise to address the mechanisms of osteoarthritis and its prevention and treatment, according to Thomas S. Buchanan, UD associate professor of Mechanical Engineering, and director of the project.

The center will be unique in that it will make use of expertise in a variety of disciplines to attack osteoarthritis, Buchanan said, with participating researchers working at levels from tissue engineering to clinical evaluation to treatment. "It will be highly interdisciplinary," he said, adding this is important in the study of such a "multi-faceted disease."

Buchanan said the grant will fund research projects in four areas: the healing of cartilage, a biomechanical analysis of the osteoarthritic knee, the effect of in-shoe wedges on the osteoarthritic knee, and the impact of knee alignment on the progression of osteoarthritis.

The four teams will match junior researchers with veteran faculty, Buchanan said. Researchers will be drawn from the Department of Mechanical Engineering, the Departments of Physical Therapy, Biological Science, and Health and Exercise Science. Two of the four projects are lead by faculty members in the Department of Mechanical Engineering.

The healing of cartilage will be examined by principal investigator John E. Novotny, assistant professor of mechanical engineering and by investigators Mary C. Farach-Carson, professor of biological sciences, and Andras Szeri, R.L. Spencer Professor



Thomas Buchanan

of mechanical engineering.

This project will study osteoarthritis at the genetic level, looking at changes in tissue composition and cellular regulation during the healing process.

Principal investigator Kurt T. Manal, a research assistant professor in mechanical engineering, will lead a team that will make a biomechanical analysis of the arthritic knee. He will be joined in this project by Buchanan and by Michael J. Axe, MD, an orthopedic surgeon and clinical professor of physical therapy.

They will use a biomechanical model based on magnetic resonance imaging (MRI) and electromyography to examine the knee during the activities of daily life. Models developed could enable scientists and clinicians to undertake "virtual surgery" and thereby assess the results that could be expected as a result of surgical interventions for various problems related to osteoarthritis of the knee.

Buchanan said he hopes the grant "will help us establish a prominence in arthritis research here in Delaware."

Buchanan has a longstanding interest in arthritis and has received funding from the Arthritis Foundation for his work. As a mechanical engineer, he said his interest comes naturally because osteoarthritis often results as a mechanical malfunction of the body.

"In simple terms, cartilage serves as a washer between the joints," he said. "When it degenerates and fails, the

result is osteoarthritis."

The NIH Centers of Biomedical Research Excellence (COBRE) grants are designed to build research infrastructure to enhance an institution's research capacity and competitiveness for additional NIH grants.

Supported by the National Center for Research Resources' Division of Research Infrastructure, these awards provide five years of funding for multidisciplinary teams to develop faculty, biomedical research expertise, and competitiveness within a thematic research focus of their choosing.

The University of Delaware is Nationally ranked among the top 20 most referenced research universities in mechanical engineering (University Science Indicators). The current graduate enrollment is 50, with 20 post-doctoral fellows. There are 21 faculty, and annual research expenditures are \$4 million. Research areas are shown to the left below, which are grouped into the focus areas shown to the right below.

Research Areas

Aerospace engineering
Biomedical engineering
Computational fluid mechanics
Combustion
Composite materials
Controls
Environmental engineering
Solid mechanics
Manufacturing
Nonlinear dynamics
Robotics
Rheology
Smart materials
Structures
Turbulence

Focus Areas

Biomechanics
Composites and Materials
Environmental Fluid Mechanics
Robotics and Control
Manufacturing Science

For more information on the research program please see <http://me.udel.edu/research/Research.msql>



Science and Engineers Scholarship Program - 2001 Annual Report to Donors

(abridged) by Nate Cloud

With 82 sophomores funded to begin research last summer, the Science and Engineering Scholars Program had the largest number of new participants in its history. This number compares with 66 sophomores in 2000 and 70 sophomores in 1999.

This year, we would like to inform our sponsors about forthcoming publications of results from the studies of the undergraduate research at the University of Delaware that were funded by the RAIRE grant from the National Science Foundation. Two articles treating the first study will appear in 2002, one in the *Journal of Higher Education*, the lead journal in its field, and another, discussing the engineering data only, in the *Journal of Engineering Education*. The results of this study showed that alumni who had participated in undergraduate research reported higher gains from their undergraduate education in many important cognitive and behavioral skills and abilities as well as greater satisfaction with their college education than did alumni with comparable majors, grades, and graduation years who had not had the research experience as undergraduates. In addition, those with undergraduate research experience earned doctoral degrees at twice the rate of their peers who had not done research. This year's Scholars give every indication that when they become alumni, their assessments of their baccalaureate experience will match those of their predecessors.

The total number of undergraduate researchers presently on the campus

who have participated in the Science and Engineering Scholars Program is 148. There are 66 seniors and 82 juniors.

Eighty-two new students were selected in Spring 2001 to participate in the 2001-2002 Program, with a total average G.P.I. after 3 semesters of 3.6. A list of the students funded, their faculty and projects is included at the end of this report. Mechanical Engineering and Center for Composite Materials* 01-02 program participants are:

poster session for the University community, program sponsors, and the newly selected Scholars (sophomores) as well as to the Scholars of the junior and senior classes. In April 2001, 62 of the junior-year Science and Engineering Scholars presented their work for an audience of about 150 students, faculty, and program sponsors. The program and some photos from the poster session can be found on the Undergraduate Research Program web site at www.udel.edu/UR.

Student Name	Faculty Sponsor	Project Title
Ian Cosden	James Glancey	Automatic Control of Conditioning Roll Gap
Joseph Feser	Romain Roy	Demonstration and Analysis of Chaotic Behavior of a Forced Rotator
David Forney	Sunil Agrawal	New Technologies for Sub-Microliter Fluid Handling in Biotech Automation
Jared Rochester	Sunil Agrawal	Expanding Spherical Rolling Robot
Thomas Shipman	Michael Keefe	Mechanical Understanding of Seams
*Benjamin Rohner	John Gillespie	Fiber Optics Strain Measurements for HUMV

All Scholars continue their research assistance in their junior year, many working during the University's January Winter Session. This is the portion of the Scholar's Program that lets the students see what they can do with their new research knowledge and that allows faculty to benefit from their students' apprenticeship learning for two more years. Each April, the Scholars present their work in a

In June 2001, 72 former Scholars received the bachelor's degree. Six former Scholars from previous classes graduated this year. Of the graduates, 56% have chosen to continue their studies in graduate or professional school; others are taking industrial positions. To request a complete copy of this report, email undergradresearch@udel.edu.



ABET

by Dick Wilkins

By 2005, the College of Engineering (COE) must implement the new Accreditation Board for Engineering and Technology (ABET) Engineering Criteria 2000. A college-wide system, driven by the University and COE Missions and consistent with individual program objectives, must be in place. In addition, it must be demonstrated that the system has identified and corrected needed changes. The ABET process is known as the Two-Loop Process.

Many ideas from the emerging EC2000 were incorporated into a major revision of the ME curriculum known as ME 2000 that was introduced in 1997.

In 1997, the COE began preparing for its ABET visit in 1999. Dr. Wilkins was appointed Chair of a College ABET Committee, and was subsequently named Associate Dean in 1998. The committee decided to use the optional previous criteria to avoid the need to implement EC2000 on a crash basis. The COE had a very successful ABET visit in 1999.

In 2000, the COE re-formed the COE ABET Committee, with

Educational Objectives were needed. These Objectives were derived from UD and COE Mission statements to reflect differences among the programs. They were written to the constituents of the programs, including employers, alumni, and students.

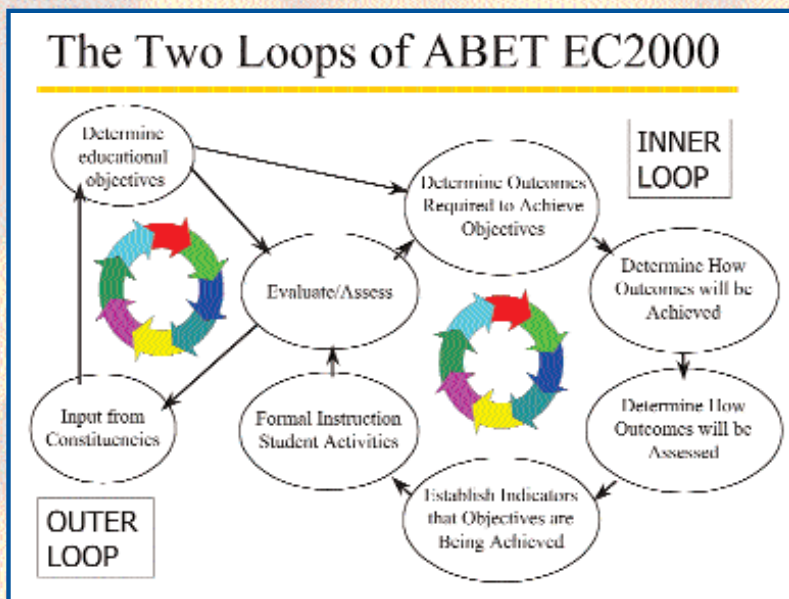
The overall educational objectives of the UD BME program are to:

Produce graduates with a strong foundation in engineering fundamentals so that they are employable in a wide range of industrial, business, governmental, non-profit and academic settings.

Produce graduates who will serve industry and society throughout their careers.

For each of the Program Objectives, outcomes for success have been defined for the inner loop. Outcomes include the "must haves" of the ABET Criteria, as well as those specified by ABET for each individual program. These include the basic outcomes of ABET Criterion 3, a-k, as shown below.

- 3a. An ability to apply knowledge of mathematics, science, and engineering.
- 3b. An ability to design and conduct experiments, as well as to analyze and interpret data.
- 3c. An ability to design a system, component, or process to meet desired needs.
- 3d. An ability to function on multi-disciplinary teams.
- 3e. An ability to identify, formulate and solve engineering problems.
- 3f. An understanding of professional and ethical responsibility.
- 3g. An ability to communicate effectively.
- 3h. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- 3i. A recognition of the need for, and ability to engage in, life-long learning.
- 3j. A knowledge of contemporary issues.
- 3k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.



Our preparation for this system began indirectly in 1994. That is when Dr. D. J. Wilkins agreed to chair the Curriculum Committee (CCOM) of the Mechanical Engineering (ME) Department at the urging of a new Department Chairman. At that point, to learn the framework and rules for curriculum reform, Dr. Wilkins applied for training as an ABET evaluator for ASME (American Society for Mechanical Engineering). Over the next few years, Dr. Wilkins was introduced to ABET Engineering Criteria 2000 (EC2000) through repeated ASME Training Workshops, accreditation visits, as well as local and national ASEE (American Society for Engineering Education) conferences and conferences sponsored by NSF or its Engineering Education Coalitions.

Associate Dean Wilkins as Chair. Each of the six COE Programs (Chemical, Civil, Computer, Electrical, Environmental, and Mechanical) developed draft Educational Program Objectives.

Although the COE routinely conducted end-of-course evaluations, the COE contracted with Educational Benchmarking, Inc. (EBI) to survey its graduating seniors on their attitudes about their educational programs. The results were communicated to the Chairs to support positive changes in the programs.

In the meantime, ME has been continuing the development of its assessment process. During the spring of 2001, its process was documented as a model for the COE. For both loops of the Two-Loop Process, Program

In turn, each outcome will have indicators to show when the outcome is achieved. At this point, we mainly rely on surveys of students in each course, seniors when they graduate (by EBI), and alumni (by EBI starting in 2001), to provide needed feedback. Other indicators, such as the Fundamentals of Engineering Exam, and recruiter surveys, are also being investigated.

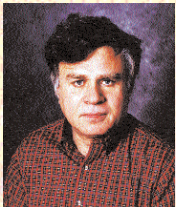
The alumni survey was completed last summer by a number of graduates from 1997-1999. (Thank you for your participation!) The need for improvements was shown in the areas of "Ability to pilot test a component prior to implementation," "Ability to understand ethical responsibilities," and "Ability to function on multidisciplinary teams." Results indicated a gap between the importance of the

item in the workplace and the preparation in that area.

Now, we would like to introduce improvements in each of these areas. We would be delighted to hear suggestions from you about ways to implement such improvements. You may respond to the current Chair of the Curriculum Committee, Dr. Keefe (keefe@me.udel.edu), or to Dr. Wilkins (wilkins@udel.edu).

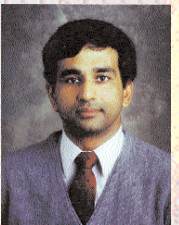
Faculty Highlights

FACULTY



Leonard Schwartz lectured at two US governments laboratories in California during early April. The topic of each lecture was "Theoretical and Numerical

Modeling of Coating Flow." The talk was given at the NASA Ames Research Center in Mountain View on April 3, 2002 and repeated at the Naval Postgraduate School in Monterey on April 4.



Sunil Agrawal was one of ten Freidrich Wilhelm Bessel Research Awardees from Alexander von Humboldt Foundation in Germany for the year 2001. Dr. Agrawal

served on the program committees for IEEE Conference on Robotics and Automation 2002, ASME Biennial Mechanisms Conference 2002, and Workshop on New Directions for Parallel Mechanisms and Manipulators 2002; In collaboration with NIST, Dr. Agrawal started a new three-year NSF-funded research project entitled "Cable Suspended Robots: Design, Coordination, and Control." In addition to his award, Dr. Agrawal was also promoted to full professor.

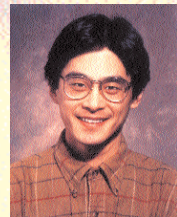
Suresh G. Advani gave a keynote lecture at the International Conference in Heat Trasfer organized jointly by American Society of Mechanical Engineering and Indian Heat Transfer



Society titled "Heat Dispersion in Fibrous Porous Media" held in Kolkata, India in January, 2002. He was also invited to be the North American Editor of the journal

Composites A: Applied Science and Manufacturing which is published by Elsevier.

Hai Wang was recently invited to join the Editorial Board of *Combustion and Flame*, the journal of the Combustion



Institute, for a six-year term. He also serves on the Editorial Board of the *International Journal of Chemical Kinetics* and the

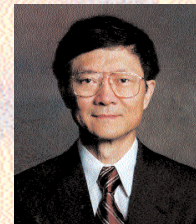
Program Committee of the Twenty-Ninth International Symposium on Combustion. Recently, his research group carried out the first small-angle neutron scattering experiment to study nanoparticles formation in reacting flows. The work will be published in the proceedings of the Combustion Institute.

On April 30, 2002, professors **Suresh G. Advani** and **Michael H. Santare** along with adjunct professor Freeman Miller and former post-doc-



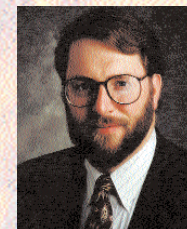
toral student Makarand Joshi were awarded patent # 6379390 for their Stemless Hip Prosthesis. The invention of this novel orthopedic device grew out of research the team was conducting under support from the Whitaker Foundation grant number RG-95-0250.

Tsu-Wei Chou was honored as a Fellow of the



American Ceramic Society at the ASC 104th Annual Meeting & Exposition in St. Louis on April 30. Chou is also now the Editor-in-Chief

of *Composites Science and Technology*, after serving as the North American Editor since 1985; and Chou is serving on the National Academy of Sciences/National Research Council Assessment Panel for the Building and Fire Research Laboratory of the National Institute of Standards and Technology (NIST).



Tom Buchanan was promoted to full professor.

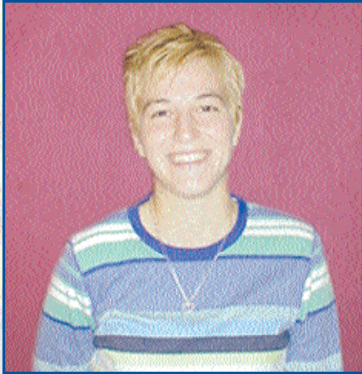
STAFF

Crystal Maccari received the 2001-2002 UD Merit Award in April 2002, which honored outstanding work performance among the University's salaried staff. The award recognizes significant contributions to the department.

Undergraduate Education

Student Focus Dawn Cintavey

by Diane Kukich



Dawn Cintavey tried to resist becoming an engineer. She really did. The fact that her older brother and sister are both engineers and her father is a machinist didn't help—it just felt too much like the obvious thing to do.

But in the end, Dawn became an engineer too—"I guess it's in my blood," she says.

Cintavey's siblings and parents never pushed her into engineering, despite the family tradition. "They just encouraged me to do whatever I really liked," she says. "But during my senior year in high school, it started to look like the right choice, since I was pretty strong in math."

Mechanical engineering is often viewed as the most general of the engineering curricula, so Cintavey chose it, figuring that she could switch later if she found something else she liked better. "But at the end of my freshman year, I realized I really liked it and decided to stick with it."

Like a lot of good students, Cintavey is well-rounded. Although she doesn't play on any formal sports

teams, she enjoys volleyball and soccer, and she helps a friend coach youth soccer. She also spent a semester studying abroad. "All I did was learn Italian," she says, "no engineering."

Now that she is a senior and about to graduate with a bachelor's in engineering, Cintavey looks back with nothing but good feelings about her experiences at Delaware.

"Senior design was great," she says. "I really enjoyed working on a team doing something real." She and two classmates developed a new connector for disk mowers made by farm equipment manufacturer New Holland. The device has to undergo two years of testing before it can actually be integrated into a product, but the company thought enough of the design that they're pursuing it. "New Holland was absolutely amazing," Cintavey says, "with giving us access

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Shane Campbell

by Diane Kukich



Shane Campbell isn't sure where his job with the DuPont Company will take him, but he does know that it won't be Delaware. And that's okay with Campbell, who spent his elementary school years in Delaware, moved to Chicago for high school, and then came back to the First State as a mechanical engineering major at UD four years ago. "I think it's really exciting that I'll be moving away, because I like to travel and experience new places," says the honor student

who received one of two ME Outstanding Student of the Year Awards for 2002.

While maintaining a 3.9 average, Campbell managed to find time to participate in several intramural sports, feed his addiction to Ultimate Frisbee, and become involved in a number of student organizations, including the Delaware Student Undergraduate Congress (DUSC) and the Resident Student Association. He is also a member of ASME and served as the association's treasurer during his senior year.

Campbell says that he found Spencer Lab to be a kind of home during the past four years. "I really liked knowing that I could go there at almost any time of day or night and find someone that I knew."

He describes senior design as fun but admits that the most valuable part of the experience was found outside the course requirements. "I think the real-world experience is necessary to prepare you for the workplace," he says. "The two most important things I learned were that there are a lot of things you can't do and that it takes a

lot longer than you think it will to do just about anything."

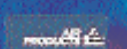
Campbell's interest in seeing the world took him to Australia and New Zealand during winter session in his junior year. And it will take him across the United States and back before he even starts working for DuPont his fall. He plans to travel first to California with a friend who is going to Berkeley. His plans then call for camping in Maine and hiking part of the Appalachian Trail.

And when he finally settles down to work for DuPont, Campbell isn't sure that he'll make a career out of working as an engineer. "I might go back to school in a few years for a law degree or a Ph.D. in business or economics," says.

Students like Shane Campbell support the view of mechanical engineering as "the liberal arts of engineering." He chose the major because he "liked to build things," but he may just decide to use his ME degree as a building block to something else. Either way, his ME degree from UD has prepared him for the future.



Senior Team



Team Case New Holland
Team Members: Melissa Warner, Scott Thompson, John Gintner



Team AstroPower
Team Members: Matt Bond, Tony Warrington, Wilson Steele, Andy Drysdale



Team Daimler Chrysler
Team Member: Tom Sawyer



Team Air Products
Team Members: Anna Kildry, Matt Kieridge, Sean Sullivan, + Shane Carroll

Team Exelon
Team Members: John Fader, Shaun Armstrong, Horrobus, + Jeff White

Team ILC Dover
Team Members: Roseann Boyer, Megan Bowman, Eddie Knott, + Tom Wagner



sponsor → ideas →



Wants	Matrix	Target Values
Material	Cost	Weight
Roller	Material	Roller
Roller	Material	Roller
Roller	Material	Roller



Synthesize concept



benchmark technology

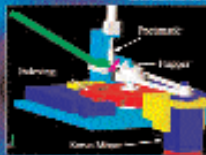
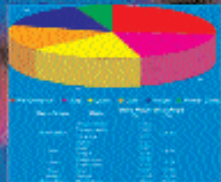
- First Place: Spillproof
- Second Place: Tool Team - Stand
- Third Place: Products - C
- Bagging Ma
- New Holla
- Quick Char



customer wants

metrics+ specifications

Customer and their Wants
Henry McCarty
Roller
Roller
Roller
Roller
Roller
Roller
Roller
Roller
Roller



Senior Design 2001

All 13 teams completed their Senior Design projects for industrial sponsors on time this past December, and received high marks from both faculty and sponsors. "A look at problems with fresh minds, exposure to students as potential associates in business, and the association with the University of Delaware," were key values expressed by sponsors early this year.

The Local ASME Chapter presented awards on February 19, 2002, to the student teams that were judged by an ASME panel to have accomplished the most outstanding projects. The awards were presented at ASME's annual dinner meeting, which also served as a "senior send-off" celebration.

A number of Alumni attended the dinner this year and enjoyed the opportunity to talk informally with the students about their project experience as well as with faculty. We hope this will become an annual activity for alumni to enjoy.

The Fall 2001 edition of Senior Design is the second year of a new single semester format. Following the inaugural of the new format in Fall 2000. The Senior Design Team Staff* developed course improvements based on feedback from students and sponsors, and they believe these improvements resulted in a more effective teaching/learning process, as well as higher value results for sponsors.

The staff team is not content with the status quo, however, and is working

together on further improvements. Key improvements planned include: better preparation of undergraduates in the design process prior to Senior Design; more complete lab facilities for testing and analysis; and proof of concept for projects; just-in-time consultant help for student teams in various design technology areas**. In addition, the team is gaining experience in facilitating the opportunity for sponsor and students to continue development activity on promising projects in the winter and spring semesters. Students have the option at a given sponsors behest, of continuing to work on projects as "independent study" or in a research capacity.

This two-page display, depicting student teams and their industrial sponsors, along with elements of the

Reality

Designs 2001

Team Polyseal

Team Members: Kirk Glick, Dan Schlemmer, Jack Williams, & David Givens



Team Daimler Chrysler

Team Members: Steven Walls, Rosemary Kowalski, Meghan O'Leary, & Jason Reinhardt



Team Baritan

Team Members: Clark Boulton, ...



Team Dentsply

Team Members: ...



Team Baltimore Tool

Team Members: Joseph Stephens, ...



Team Hardcore
Team Members: Chris Gans, Shannon Fields, Craig Pinken, & Dave Mulrooney

Team Xymid

Team Members: Joe Jones, Steve Knight, & Merrill Dougherty



→ design → proof of concept

PolySeal team Closure
Project: Baltimore Chisel Test

Tie - Air Chemical Machine & Case
and Team - Range Knife



model concept



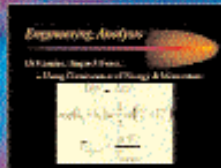
testing + analysis

Budget - Baltimore Tool

Category	Approximate
Material	\$14.00
Personalized Components	\$172.00
Shipping to U.S.	\$10.00
Shipping to Europe	\$50.00
Manufacturing	\$100.00
Profit	\$100.00
Subtotal	\$346.00
Materials	\$100.00
Shipping	\$100.00
Profit	\$100.00
Total	\$646.00



prototype concept



design process, is on display in poster form in the main hallway in Spencer Lab. The display case also includes a brass and wood plaque positioned on the poster in place of the text of this article. Each year the names of the members of top project team (2001-PolySeal) will be engraved on the plaque.

For more information contact*:

Nate Cloud, cloud@me.udel.edu, 302-778-4567;

Dick Wilkins, wilkins@udel.edu, 302-831-2006;

Michael Keefe, keefe@me.udel.edu, 302-831-8009;

Jim Glancey, jglancey@UDel.Edu, 302-831-0712/1179

The Senior Design Staff Team is developing additional resources to sup-

port student teams in their execution of their design projects. Additional space and test equipment are being put in place at Spencer Lab and we are working on defining a process that will provide "just-in-time" learning in technology areas that typically aren't taught in a systematic way during the student's undergraduate education at Delaware. Examples are: pneumatic system design; hydraulics; power transmission components; etc. We think one of the key ingredients for this process is alumni who have specific knowledge in technology areas associated with design development of products and processes. *We don't have all the details worked out but if you think you would like the opportunity to act as a "just-in-time" consultant - working briefly with student design teams; and are rea-*

sonably close to the Newark area (or are at ease with electronic communication), please contact Nate Cloud at 302-778-4567; cloud@me.udel.edu.

If you think your enterprise would like to sponsor a Senior Design project; or you would like to serve** in a coach/consultant capacity with student teams, next year (Fall 2002) please contact Nate Cloud.

Several Alumni have been instrumental in sponsorship in the past two years and/or have been the primary student team contact for the project: Scott Hemphill, '86 - Hardcore Composites; Mike Smoot, '82 - Xymid, LLC; Matt Savage, '00 - Daimler Chrysler; Dave Friemuth, '90 - Harley Davidson; Bob Andrews, '92 - Johnson Controls.



Solar House Update

by Diane Kukich

In the April/May issue of the Solar Decathlon newsletter, program creator and national director Richard King wrote, "This competition is one of the hardest challenges ever devised.... Telling my colleagues at the Department of Energy and the National Renewable Energy Laboratory about the idea took courage and confidence. Courage because nothing like it had ever been done before and confidence because, before I set forth in earnest, I had to believe we could do this."

Lian-Ping Wang, faculty director of the UD solar team, can relate to everything King says. The project has proved to be extremely challenging, and it has taken courage to carry out all aspects of the fund-raising and technical activities. But Wang, like King, is imbued with confidence—confidence in the project team of students, faculty advisors, and generous sponsors and in their ability to take the project to completion.

The project will culminate in the 800-sq.-ft. house being erected first on the UD campus at 115 Delaware Avenue, then on the National Mall in Washington, DC, next at the Franklin Institute in Philadelphia, and finally back on campus where it will serve as a display and living laboratory.

Wang explains that while the team



Artist's rendering of UD's entry for the Solar Decathlon

has raised an amount equal to what they initially thought the house would cost, they have learned some lessons along the way about esti-

mates and reality. "We've really pushed the envelope on materials to take advantage of the best technology available," he says. "For example, we're using heat mirror windows because of their energy efficiency. Things have ended up being more expensive than we expected. Also we would like to have additional funds to support 15 undergraduate and vocational school students this summer when the construction and test-



Lian-Ping Wang and Lauren Leonard present a model of the UD Solar House.

ing of the solar house take place."

According to Ajay Prasad, faculty advisor on the project in the area of mechanical and electrical systems, the technologies being used in the house are not new in themselves—the novelty lies in their integration into a single house.

He explains that the team has sometimes had to be quite creative in interpreting the competition rules. For example, they wanted to use a tank of water to simulate a geothermal reservoir for heating and cooling with a heat pump, but the contest rules dictated that only two tanks be permitted on each lot—one for freshwater and one for wastewater. A careful reading of the rules, however, showed that a minimum size was specified for the wastewater tank, but there was no maximum. So Prasad worked with student technical leader Thomas Shipman to design a large divided tank, with one half dedicated to the geothermal function

and the other half for wastewater.

The project is now entering its most exciting phase—construction and testing—under the leadership of James Glancey, faculty advisor and professor of Bioresource Engineering and Mechanical Engineering. At the time of this writing (early May), the team has applied for a building permit from the city of Newark, and ground-breaking is scheduled for May 16. A construction kick-off organized by student leader Lauren Leonard and Prof. Glancey resulted in an impressive turnout of students. Many of these students will continue their involvement during the summer as Solar Decathlon Fellows or Interns. The anticipated hands-on participation has attracted a fresh surge of talented students and leadership.

Wang is justifiably proud of the tremendous fund-raising effort undertaken to date. "We've raised about \$142,500 so far in cash and in-kind donations, not to mention the expert help we've received from many of our sponsors," he says. "But we still need help. I would really encourage alumni to support the project in any way they can, and I especially would like to invite them to come to campus this summer to see the work in progress."

To learn more about the Solar



From Left: Ajay Prasad, Chad Boulden, Lian-Ping Wang, Tom Shipman, Lauren Leonard, Liz Catoni, Chris Lane, and Roseann Boyer

House Project, and to find out how you can help as well as learn about this exciting project, please contact Lian-Ping Wang, at lwang@me.udel.edu

Tentative Schedule for UD Solar House

Construction on UD campus (115 Delaware Avenue)
Solar Decathlon Competition on National Mall (Washington, D.C.)
On Display at Franklin Institute (Philadelphia, PA)
On display on UD campus (115 Delaware Avenue)

Summer 2002
Late Sept. to mid-Oct. 2002
Mid to late Oct. 2002
Indefinitely

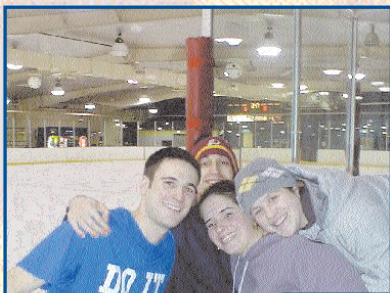
Engineers Week

by Dawn Cintavey w/Diane Kukich

Engineering week was a full seven days of activities ranging from the silly to the serious. Students had the opportunity to do everything from shooting balls through a net to networking:

- Broom hockey tournament—a crazy sport played on an ice hockey rink with brooms as hockey sticks, a rubber ball as the hockey puck, and sneakers as ice skates.
- Basketball and walleyball tournaments—geared toward students of all engineering fields and aimed at facilitating interaction among College of Engineering students, faculty, and staff.
- Women in Engineering Night—an informal event for students to socialize and learn about current opportunities in engineering, with the overall goal being to encourage females to stay in engineering and to make contacts for careers and internships.
- Resume workshop—presentation by career services staff and a take-home information packet, including tips and sample resumes.

- Academic bowl—a team competition comprising general trivia and engineering-related questions.
- Engineering Carnival—educational activities such as paper-airplane and tower-building contests, as well as sports contests such as a basketball hoop shoot, a putting range, darts, and a gladiator joust.
- E-Week Banquet—an event for engineering students and faculty to celebrate and conclude Engineering Week, including dinner, a speaker, and a raffle.
- Technical Job Fair



continued from page 9

to all of their resources, especially our main contact Melanie Harkcom."

Cintavey also got very involved with the 2002 National Engineers Week program at UD. Under Dean [Michael] Vaughan's direction, we had three weeks to plan everything, including sports tournaments, a job fair, a resume clinic, a quiz bowl, and a banquet. It was a great experience—I had been involved with planning small events before but never on this scope, with setting up an entire week's worth of events."

The Solar Decathlon has also provided Cintavey, along with dozens of other students, with valuable experience. She is on the "Getting Around"

team, which will work on fueling and using an electric car during the entire week that the solar village is on display in Washington. "We have to use solar power to run the car, and the team that accumulates the most miles in a week wins that contest. We're going for the lightest person in the group to be the driver," she laughs. UD is competing against 13 other schools in the decathlon.

Despite how serious she is about academics, Cintavey points to the equal importance of the positive social life she developed in ME at UD. "I was really glad I got to stay with the same group for four years. We got very close, which helped me a lot

in a big college—I didn't feel lost at all."

What's next for this student leader and recipient of many honors? "I just accepted a position as a process engineer with W. L. Gore in Elkton," she says. "I'm really excited about working for the company and being able to stay in Newark and still be less than two hours away from my family [in southern Delaware]."

The Gore company is known for its flexible work structure and the diverse opportunities it offers its employees to move around within the company and sample a variety of work experiences. Dawn Cintavey should fit right in.



Awards

Senior Year Awards:

W. Francis Lindell Mechanical Engineering Award To The Distinguished Senior - for the extraordinary senior mechanical engineering student who has demonstrated creativity, academic accomplishment and achievement as determined by the faculty of the department.

Shane A. Campbell

Dawn M. Cintavey

Mary And George Nowinski Award For Excellence In Undergraduate Research - an award given to a mechanical engineering major whose senior research project is considered, by the faculty, the most interesting in the current academic year. The award honors Mary Nowinski, beloved wife, and Dr. Jerzy (George) Nowinski, professor emeritus, longtime friend and academic leader in the Mechanical Engineering Department.

Jeffrey M. White

Delaware Section Of The American Society Of Mechanical Engineers Senior Design Project - for achievement in the senior design project based upon final design presentations as judged by members of ASME-DE section, with the concurrence of the faculty.

First Place: Spillproof Closure

Nicholas Barresi

Scott Greene

Daniel Mc Dermott

Mark Liebal

Second Place: Chisel Test Stand

Matthew Mitch

Marc Orgovan

Joseph Stephens

Tie For Third Place: Chemical

Bagging Machine

Sean Bullard

Shane Campbell

Matt Eskridge

Adam Kinzey

Tie For Third Place: Quick Change Knife

Keith Abraham

Dawn Cintavey

Melissa Wanner

MEEG 101 Undergraduate Teaching Assistant Award - in recognition of selected senior ME students who developed their leadership, communication and teaching skills by providing support to new ME students in the introduction to mechanical engineering class.

Shane Campbell

Elizabeth Cantoni

Lauren Leonard

Junior Year Awards:

W. Francis Lindell Mechanical Engineering Award To The Distinguished Junior - for the extraordinary junior mechanical engineering student who has demonstrated creativity, academic accomplishment and achievement as determined by the faculty of the department.

David C. Forney, III

W. Francis Lindell Mechanical Engineering Achievement Award - for the junior mechanical engineering student in recognition of scholarship and creativity in engineering as recommended by faculty of the department.

Thomas N. Shipman

Sophomore Year Awards:

W. J. Renton Award For Outstanding Sophomore - a monetary award for the sophomore student in recognition of outstanding academic achievement as recommended by the faculty of the department.

Todd M. Fitzgerald

Other Department Awards:

Delaware Section Of The American Society Of Mechanical Engineers Outstanding Student - an award to the outstanding student in the

Delaware section of the ASME.

Christopher R. Lane

American Society Of Mechanical Engineers Student Section - a certificate to outstanding member of the ASME student section for good academic standing and valuable contributions to the chapter.

Roseann E. Boyer

Robert T. Bosworth Scholarship - a financial aid scholarship to a mechanical engineering student on the basis of academic performance.

Joseph P. Feser

Redden Scholarship - a financial aid scholarship to a student majoring in mechanical engineering with outstanding academic performance.

Richard T. Slack

Helwig Graduate Fellowship - a monetary award for the first-year graduate student in mechanical engineering with outstanding academic achievement.

Jason L. Pusey

Joshua J. Radice

College Awards:

Alumni Book Award - award to a sophomore or junior in each college who has a sincere desire for knowledge and has participated in extracurricular activities designed to help fellow students achieve academic success.

Jennifer Pahnke

Boeing Scholarship - two scholarships are awarded for a full-time junior student in electrical and computer engineering or mechanical engineering.

David C. Forney, III

Conectiv Company Scholarship - two scholarships awarded to electrical and/or mechanical engineering majors who are from the Delmarva area. Selection is based upon academic excellence and promise in the field of engineering.

Dirk Veenema

Liston Houston Scholarship - several scholarships are awarded to outstanding juniors majoring in civil, electrical or mechanical engineering. Selection is on the basis of academic performance, scholarly and campus activities, and need.

*Antonia Barkley
Jared Rochester*

Engineering Alumni Association (EAA) Scholarship - EAA

Scholarships are presented to junior engineering students who have

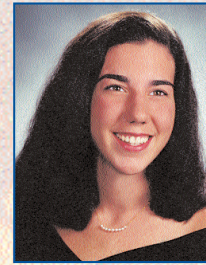
demonstrated academic excellence, community service, and professional development.

Gwen V. Thorson

Center for Composite Materials Outstanding Senior Award - a monetary award to the outstanding senior in the undergraduate Research Program for cumulative service and research contributions to the Center activities.

Steven D. Wright

Lauren Leonard, Senior won an Outstanding Student Leader Award at



the 2001-02 Registered Student Organization (RSO) Reception in Trabant Hall on May 9th. Lauren has been the key student leader for Solar Decathlon, and a student officer in our ASME organization. Over 40 student leaders from across campus were nominated for this award.

Fred Kohloss Wins 2002 Outstanding Alumni Award

by Nate Cloud with Tsu-Wei Chou

In 1993 the Engineering Alumni Association began to recognize selected alumni with Outstanding Alumni Awards. This year two distinguished alumni, Richard E. Hagen, C&E and Frederick H. Kohloss, MSME, '51, were selected from over 9,000 active alumni of the School of Engineering. Fred Kohloss was presented with the "Outstanding Alumni" award on May 3rd at Honors Day ceremonies in Pierson Hall.

Fred has had a distinguished career in engineering that spans more than half a century, including service to his country during World War II.

Fred is an extremely well-rounded individual who holds degrees not only in engineering but also in law. He has taught engineering, functioned in an advisory capacity for government and private-sector organizations, and served the U.S. Army in an engineering capacity in Europe, Japan, and the Philippines. He is also an accomplished athlete, having completed the

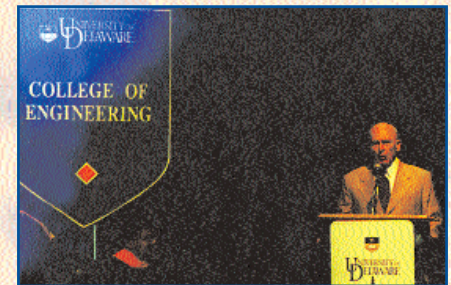
Honolulu Marathon six times between 1976 and 1982.

Despite his many and diverse activities, Fred's greatest accomplishment, in our view, is that of simply being a "good engineer." Fred has been a consulting engineer in Hawaii since 1956, and he can take credit for designing the mechanical services for many major projects around the world. He has operated branch offices of his Hawaii engineering firm in Tucson, Cleveland, San Francisco, Denver, Guam, and Melbourne, Australia. His major projects include the Sheraton Waikiki Hotel, the Kaiser Moanalua Medical Center, the Grosvenor Center, a Tucson newspaper plant and offices, and Clark Air Base Hospital in the Philippines.

Fred has also been active in a number of professional organizations in disciplines ranging from heating and refrigeration to military engineering, building services, fire protection, plumbing, and electronics. His many honors include being named a Life Fellow in both the American Society of Heating, Refrigerating, and Air-Conditioning Engineers and the American Society of Mechanical Engineers. He has also won numerous awards, including being named

Hawaii's Engineer of the Year in 1980 and receiving the Lifetime Achievement Award from the Hawaii Council of Engineering Societies in 1999.

We are very pleased that Fred can add the University of Delaware,



Engineering School Outstanding Alumni Award to the list. Please join us in congratulating Frederick H. Kohloss, our 2002 Mechanical Engineering Outstanding Alumni Award recipient.

We urge you to make nominations for the 2003 Outstanding Alumni Award. Please see <http://www.udel.edu/alumni/awards.html> for a nomination form. If you prefer, you may contact Nate Cloud, (see contacts list on page 19) for help with the nomination process if you believe you have a worthy nominee. The above web site provides the following general description of the award and criteria for nomination:

The Outstanding Alumni Awards are presented annually to an alumnus and alumna in recognition of their exemplary work on behalf of the University of Delaware and the Alumni Association. For over 50 years, the Alumni Association has honored University graduates with this award.

Nominees should exhibit exceptional volunteer work on behalf of the University of Delaware and/or the Alumni Association. Service to the University may be a single act or it may be a long record of participation.

Business and professional accomplishments, community service, and other factors are considered secondary to University and/or Alumni Association service.



A reception was held for Fred and Peggy Kohloss (lower right) at the Blue and Gold Club, followed by dinner at the University's Vita Nova restaurant.



Alumni

Alumni Profile: Tom Frey



Born in 1962 in Monesson, Pa., Tom Frey moved to Delaware in 1972. He earned his BME at UD in 1984. From 1984 to 1988, he worked at

Thiokol (now ATK) in Elkton, Md. as a Quality Engineer. He received his MME at UD in 1990, with a concentration in composite materials under the advisorship of Dr. Jack Vinson. In 1989, he returned to Thiokol as a Design/Process Engineer in the Composite Structures group. Since 2000, he has worked at W.L. Gore and Associates as a Process/New Product Development Engineer in the Industrial Products/Fibers group.

Frey is co-inventor of several patents relating to rocket motors. He is a member of SAMPE and DAPE, and holds a PE license in DE. Married with two children, Frey lives in Wilmington, Del. He enjoys sports, especially basketball, tennis, and bicycling, as well as music, especially piano, guitar, and flute.

When asked about his most challenging project at Thiokol, Frey mentions the design and construction of a composite interstage structure for NASA's Lunar Prospector Satellite mission. "We started with a blank screen and within a few months had built a full scale prototype which passed flight load tests," he says. "After successfully completing the mission, the unit was intentionally crash landed on the moon. It is very rewarding to know something I helped build obtained information that will aid future manned space exploration and is still up there on the moon." On Gore, Frey says, "It is

great to be part of a company with a strong UD connection and focus on improving the quality of life. It is amazing to learn of all the different industries in which Gore adds value."

On Dr. Vinson and UD, Frey says, "It was an honor to work with an advisor who is a leader in the composites field at a university that is at the forefront of composites research. As a teacher, Dr. Vinson always brought enthusiasm to the classroom. He helped make it fun for me to learn about composites. He has a teaching gift about which other teachers should learn. Plus, he really did write the book on composite structures. We are very fortunate he chose to move from industry to academia and to UD in particular."

Alex Dee

Seeking better drivers and putters from composites

Reprint with permission from *The Messenger* – Vol. 10 No. 3, 2001



photo by Dave Gattley

Although his sport is beach volleyball, Alex Dee designs composite shafts for Fujikura golf clubs.

Sporting interests have driven the career of Alex Dee, EG '98M, who now designs composite golf shafts used on the PGA tour for Fujikura Composite America of California.

As an undergraduate at the University of California-San Diego (UCSD), Dee developed an interest in composite materials while taking a graduate-level course on the subject. He was intrigued by the fact that fiber-reinforced composites can easily be tailored, enabling engineers to create unique product designs with high strength-to-weight ratios.

Upon graduation, Dee decided to enter the field. "I had heard that the number-one commercial use of composite materials was in the golf industry," he says.

"My first job out of UCSD was at a company called Horizon Sports Technologies [HST]. When I got there, it was a small company designing and manufacturing graphite golf shafts for TaylorMade Golf. It was a lot of fun working there, and I learned a great deal about the industry. By the time I left, HST was one of the largest shaft manufacturers in the world, thanks to market factors and its strong engineering team."

While working at HST, Dee turned his attention to graduate school as a means of increasing his knowledge and understanding of composites. He had every intention of enrolling in a program on his native West Coast, and gave serious consideration to the University of California-Los Angeles, California Polytechnic State University-San Luis Obispo and the University of California-San Diego.

Then, however, he took a cue from an acquaintance during a friendly game of billiards. "One night, while playing pool at a local bar with a friend, I was introduced to one of his co-workers, who was a designer of composite structures at a local aerospace company," Dee says. "He was a graduate of MIT, and we got to talking about graduate programs for composites. He said that if he were going to do a graduate program in composites, he'd go to the University of Delaware. That night, I looked up the University and was immediately impressed with its credentials. I applied and the rest is history."



Upon enrolling at Delaware, Dee found that his adviser was Jack R. Vinson, H. Fletcher Brown Professor of Mechanical Engineering, whose text he had used as a reference while working at HST.

It took some time adjusting to the East Coast lifestyle.

"Like anybody who leaves his hometown, I was freaked out at first. It took some time getting used to. You hear about all these stereotypes of East Coast people, but it was all untrue at the University of Delaware," he says.

"I established some great friendships and studied under the nicest and most well-respected professors. I felt that the professors really cared about their students. I loved the campus and the area, too, even though, in the beginning, I felt that I was in the middle of nowhere."

Once Dee got his feet on the ground, he quickly got them off the ground, joining the men's club volleyball team. "I had been told that volleyball in the East was weak, but

that turned out to be untrue, as well," he says. "Of course, driving over an hour to get to the ocean was a drag, but driving less than an hour to get to another city was amazing."

Also amazing was his research, Dee says, as he studied high strain rate properties of composite materials.

He says, "It was an honor to work for and learn from Dr. Vinson," a pioneer in composite materials research at UD, adding that his association with the Center for Composite Materials was "extremely valuable."

Dee says he also was influenced by center director John W. Gillespie Jr., Department of Mechanical Engineering chairperson Tsu-Wei Chou and research technician Touy Thiravong, who he says "are part of a composites dream team at UD."

Dee says that golf shaft design is a complex problem because there are several specifications that must be met. "In a given shaft, I'm trying to design to a defined bending stiffness, twisting stiffness and weight distri-

bution, as well as considering geometry, strength and durability. I'm also taking into consideration ease of manufacturing and cost.

"Without special software, shaft design can be a nightmare of trial and error. My first six months at Fujikura were spent writing the software that aids us in the design of every shaft we make," he says.

Although Dee has played some golf, his passion is volleyball at least his recreational passion.

"I'd rather hit the beach and play some volleyball than hit a few golf balls," he says. "However, what is really neat is seeing that the shafts I've designed are being well-received by PGA tour professionals. Fujikura Composite has been the number-one graphite shaft on the PGA tour for the past 16 weeks in a row now. It's also neat going to a sporting goods store and seeing products I've designed on the shelves. How cool is that?"

—Neil Thomas, AS '76

Alumni Class Notes & Feedback

Zoran M. Djuriscic, M.S. '99 - I defended my Master's thesis at UD in 1999. In November 2000, I received John Zink Award for outstanding academic achievement in combustion engineering. I am currently a 3rd year Ph.D. student at the Chemical and Fuels Engineering Department at the University of Utah.

S. Subbiah, PhD. '89 - is now a Vice President at Fluent Inc. in Lebanon, N.H. At Fluent, he is in charge of their U.S. Business Operations and also oversees their product management department. He and his wife, Sarah Robson, live across the river in Norwich, Vermont with their two daughters.

Stephen Kinsey, Ph.D., '77 - I am now Manager-Gas Development for BSH Home Appliances Corporation. My responsibilities cover all gas components and technologies for the various home appliances manufactured in the U.S. by BSH. These are ranges, cooktops, and gas clothes dryers. I graduated in 1977 with a B.S. in both Mechanical Engineering and Physics. I attended and graduated from the

University of Texas at Arlington with both Masters of Mechanical Engineering (1989) and the Ph.D. also in ME (1991).

Yuan-Ruo Wang, Ph.D. '91 - is an Engineer V with the Texas Department of Transportation. His wife Joy Wang is Senior Auditor for the State of Missouri. They have a daughter Christine Wang, 10 years old and son Melvyn Wang, 5 years old

Ed Jackson, '83 - Recently joined MBNA America in Wilmington, Del. as Corporate Energy Manager after spending 18 years with Conectiv.

Richard W. Wilson, '73 - Sr Staff Engineer, Motiva Enterprises, LLC.; Daughter Nancy Lee Wilson Stewart attended UD '1992 - 1996, and received her undergraduate degree in Animal Science, '96.

William S. Patterson, '58 - Area Director, College Prospects of America, Inc., was prompted by the article on Johnson Controls in the Fall/Winter '01/'02ME News, to point out the need for research to improve safety and quality control of nuclear power plants. Bill suggests research in the areas of: risk analysis of modes of transport of spent fuel rods from plants to Yucca Mountain, Nev.

William R. Chambers '78 - was recently awarded the Excellence in Trade Award by the Thaddeus Stevens College of Technology Alumni Association at its annual business meeting. Bill is a sophomore mechanical engineering technology instructor at the college.

Kirk Mountain, '87 - Moved from San Francisco, Calif. to Greensboro, N.C. to start a computer business. This new business is called Smooth Systems, LLC, www.smoothsystems.com, which provides IT outsourcing and systems integration for small to medium-sized businesses. Kirk is engaged to be married to Melissa Dong in November of 2002.

Obituaries

George Weatherby Sickler, Jr. - BSME '41, died August 24, 2001 in Dallas, Tex. following a brief illness. George was born in 1920, in Penns Grove N.J. and attended public schools in Wilmington, Del. Following graduation from UD he worked in support of the WW II effort at Westinghouse Electric Corporation. George retired in 1986 as President and CEO of Del Norte Technology Inc., in Euless, Tex. George is survived by five children and their families.



Reflections and Memories - '60s Basketball Engineers

by Nate Cloud

40 calendar years; 324 married years; 21 children; and 13 grandchildren later (and still counting)

This spring marked the 40th anniversary of one of the most successful basketball teams in the history of the University of Delaware. The '61-'62 team finished the season with an 18-5 record—losing the five games by a total of only 20 points! The team had many records and accomplishments but one that they are particularly proud of is that they were fifth in the nation in rebounding! Three players on the team still remain on the top 15 list in rebounding and scoring, even though NCAA teams in those days did not allow freshman to play on varsity teams, and there was no three-point shot.

The team was also unique in that seven of the ten team members were Engineering Majors; and often during a game all five players on the floor for Delaware were Mechanical Engineering majors! All members of the team have had successful and varied careers in the business world over the past 40 years. A short biography of the engineering members of the is included to encourage all of our alumni to stay in touch and share what's happening in your life with other Alumni.

The team held a reunion this spring to mark their 40th anniversary. Many of the memories of key games – who took the last shot, etc., etc. – didn't match, especially when reflecting after dinner at the Deerpark, but in some ways it seemed like just yesterday!

The Early '60s basketball-engineers group* has started a university scholarship fund for a deserving engineer-athlete. In the first year of this project over \$6,000 has been raised toward the minimum \$25,000 required for a sustainable annual scholarship. It is hoped that this effort will help keep the group together for many reunions to come.

* including Gerry Gallucio, BEE '66, 62/63 team

We thought you might be interested in a snapshot of the 40 years of the engineering graduates on the '61-'62 UD team.

Dave Sysko, ME '63: I joined IBM after graduating and then moved into the financial services business. I semi-retired in 1992 and founded two non-profits, Norman's Future Stars and Public Allies, Delaware. Currently I'm working with a personal holding company for a family based in the midwest. I've been married for 32 years to Patrice Kosey, '68, and have two children, Ryan and Suzanne.

Nate Cloud, ME '64: I have practiced Engineering for 40 years: 35 with the Dupont Co. in Wilmington and currently with Cirrus Engineering, Inc., Wilmington and am founder and principle. I married Carolyn Taylor, '65, almost 38 years ago and my family has grown to four children (incl. Karen, '87), and three grandchildren. I finally satisfied my obsession with round ball after six years in the Eastern Basketball Association in the late 60s.

Peter Cloud, ME '64: After leaving UD, I married Marcia Maucher '64, fulfilled my R.O.T.C. commitment and, with the aid of my ME degree, began a 30 plus year career in the plastics (LNP/ ICI/ Zeneca) and Ink Industries (Sun Chemical). Now retired, I have become a part-time algebra instructor at Delaware Technical and Community College. Marcia and I have two sons Michael and Jason '92; Michael and wife Arleta have made us grandparents of twin boys, Max and Phillip—a third generation of "Cloud brothers".

Bill Haggerty, ME '65: On March 1, 2002 I retired after 40 years as a river pilot for the Pilot's Association for the Bay and River Delaware. My son Chris graduated from U.S.N.A. and was a Navy Seal for ten years. My daughter Lynn graduated from Fordham University and is an executive for MBNA. Lynn is married to Brian Wong, and they have two lovely daughters Lindsay 7 and Kennedy 6.

Bill Wagamon, ME '63: After graduation, I

served two years on active duty as U.S. Army Artillery officer. The majority of my career was spent in various sales, marketing, product development, and management assignments with Hercules, Inc. Currently, I'm employed as Director of Sales with local company, Applied Extrusion Technologies, Inc. I married Allyn Arnold and have two daughters.

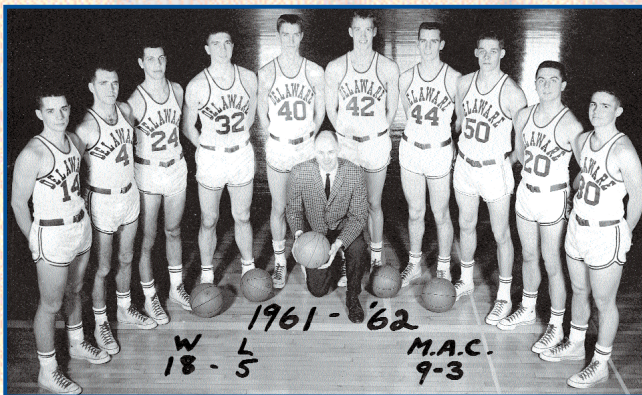
Ron Smith, CHE '65: I joined the nylon polymer technical organization at DuPont in June 1965 after graduation. I have worked in a technical engineering capacity at three different plant sites; Seaford Del., Camden S.C., and Waynesboro, Va. where I currently reside. My primary functions have included new plant projects, plant expansions, and plant operations roles. I married childhood sweetheart Carrol Myers while at UD - I have two married children, one in Dallas Tex. and one in Salisbury Md., and three grandchildren.

Bill Lehman EE '62 - I have a Wharton Business Certificate and am a professional engineer with work experience including two years both as a U.S. Army Artillery Officer and at U.S. Steel as well as 33 years with Merck & Co. Inc. I finished up as Director of Utility Engineering. I married Carole Doughty in 1967 and have two children, Brian, '91 and Jill, '93 and two grandsons, Christian and Quentin. Since retiring in 2000, I am enjoying hobbies, time spent in Stone Harbor, N.J., and trying to improve my golf game.

Rod Steele, CE '63. I attended JD, Dickinson School of Law (Penn State), LLM George Washington University, JAG Corps, and participated in the U.S. Army, (Viet Nam and Pentagon), law practice exclusively patent, trademark, and copyright law. Presently I serve on the Board of Directors for Akerman Senterfitt, a 360 attorney law firm. I'm married to Karen and live in West Palm Beach, Fla. My son Kevin is Deputy District Attorney in Montgomery County, Pa, and son Ryan is a junior in high school. I have a granddaughter Caroline Addison.

Siebo Friesenborg, ME '65: I joined IBM in Wilmington and stayed with them through Gaithersburg, Md., Waterloo, Belgium; Dallas, Tex., and now Tucson, Ariz. My current job is the analysis of performance of disk products. I married Doranne Marcial a week before the graduation ceremony and have children in Venice, Calif., Houston, Tex., and Mannesquan, N.J. Friesenborgs in all time zones! We don't bring up the subject of grandchildren.

*didn't play in '61-'62 but were on the team in the early '60s.



1961-62 team: Haggerty; Barry; Wilson; Wagamon; P.Cloud; N.Cloud; Sysko; Smith; Cosnek; Schonauer



2002 team reunion at Deerpark: N.Cloud; P.Cloud; Haggerty; Barry; Sysko; Wagamon; Lehman (61' team); Schonauer.

Development Report

by Kevin Obrien

The Campaign for Delaware, scheduled to conclude in December 2003, continues with great success. As of 4/30/02, close to \$284,000,000 has been raised in total commitments, far exceeding the original goal of \$225,000,000 announced at the Campaign Kickoff in October 1998.

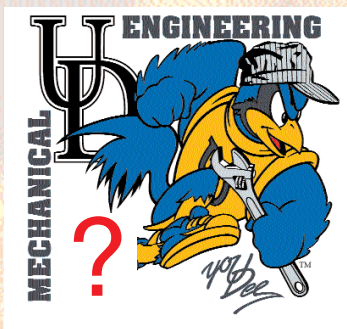
The College of Engineering is making great strides toward reaching its goal of \$45,000,000. As of 4/30/02, approximately \$34,400,000 in total commitment has been secured for the College.

A major focus of fundraising for the College of Engineering has been the \$25.2 million addition to P.S. du Pont Hall. The goal has been to raise \$16 million of the total cost from private sources. To date, the amount raised is \$13,278,000. We hope to raise the remaining \$2,722,000 within the next several months. Significant naming opportunities remain available for donors making gifts of \$50,000 and above. All gifts of \$5,000 or more will be recognized on a plaque within the new facility.

Other fundraising initiatives of the College continue to be: endowed faculty positions (chairs, professorships, teaching awards), endowed scholarships and endowed fellowships.

While the dollars raised in this campaign are certainly crucial, equally important is our goal to increase our alumni participation. Your gift to the Campaign for Delaware, regardless of the size, is important and very much appreciated. One of the criteria used in college rankings, such as that produced by U.S. News and World Report, is the percentage of alumni who give to the institution. The greater the participation percentage, the higher the institution is ranked. Your gift and participation help increase the value of your degree!

Contact: Kevin Obrien, Associate Vice President, University Development, 302-831-2104; kobrien@udel.edu



Logo Contest II

We didn't get any suggestions for a new logo for the MENews (see "Logo Contest" MENews Fall/Winter 2001-2002); but a few Alumni contacted us and expressed the opinion that The ME YouDee was a bit antiquated..... i.e., "what's up with the railroad engineer's cap and the adjustable

wrench!?" We thought we would try again to get your ideas, but this time limit the scope a bit. Please give us your ideas on what should make YouDee more representative of a mechanical engineer today? After we get your ideas we will give them to Kieth Heckert, Art Director - University Public Relations along with our input to create a new ME YouDee. Hope to hear from you.

Contacts

Contact information for faculty/staff features in this newsletter is included below. We urge you to contact these people if you have any questions or would simply like to talk with them about the topics in this newsletter.

Chairs Corner

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ALUMNI FEEDBACK - What's New With You?

Do you have any feedback (comments, questions)? Or let us know any current events or info not covered by the data sheet below.

INFORMATION FORM FOR THE DEPARTMENT'S RECORDS

Name _____
First Middle Last Maiden

Delaware Degree BME Date _____ MME Date _____ Ph.D. Date _____

Spouse's Name _____ DE Alum? _____

Mailing Address _____

Home Phone _____ E-mail _____

Company _____ Your Position _____

Mailing Address _____

Business Phone _____ Fax _____

E-mail _____ Web Address _____

Please identify if your company is an affiliate or subsidiary of a larger company _____

Return this form to: Nate Cloud, 126 Spencer Lab, University of Delaware, Newark DE 19716 and/or contact me anytime at cloud@me.udel.edu or 302-778-4567



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