



Startup of New Global Innovation Center

Technology solutions exist to many of the world's most pressing problems, but new business models may be required to get these solutions into production.

That is the premise of the Global Innovation Center for Energy, Environment, and Health (GIC). The GIC was funded in the fall of 2005 by the Academic Enhancement Program (AEP), a Colorado State University initiative which makes strategic investments in University programs that show the potential to rise to world-class performance.

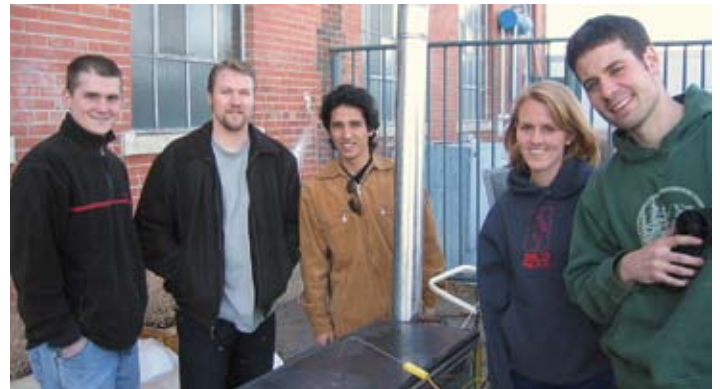
Dr. Bryan Willson and Paul Hudnut, CSU faculty members who guided the launch of Envirofit International – a CSU-affiliated nonprofit corporation that is using innovative technology and new business models to reduce air pollution in Asia – proposed the GIC to pursue opportunities to make an impact on three pressing world issues: energy, environment, and health. The GIC was co-sponsored by Allan Kirkpatrick, head of the Department of Mechanical Engi-

neering, and Ajay Menon, dean of the College of Business.

The linkage of energy, environment, and health is illustrated by one of the world's first pieces of mechanical engineering technology – the simple cookstove.

Almost 3 billion people – half of the world's population – cook their meals every day using solid fuels: Approximately 2 billion cook with wood and 1 billion with coal. The energy impact of these 500 million cookstoves is huge. They consume almost 5 billion kilowatt-hours of energy every day, making them a major source of greenhouse gases.

But the environmental and health impacts are stunning. These stoves use very primitive combustion technology, resulting in high production of carbon monoxide, particulates, and toxic pollutants such as formaldehyde and polycyclic aromatic hydrocarbons. This pollution is a major source of the ever-present cloud of pollution choking much of the developing world, but the most devastating health impact is from indoor air pollution.



Students and cookstove project at the EECL.

Many stoves are used indoors, often without chimneys. The indoor air pollution (IAP) from stoves is the leading cause of death for children under age 5 and the second leading cause of death among women. Almost 2 million premature deaths each year are attributed to IAP from cookstoves.

Cookstove activities rapidly are expanding on campus. Undergraduate and graduate students are involved in designing clean and

efficient stoves. The new Advanced Stoves Laboratory, located in the EECL, is nearing completion.

The first program will be an in-depth study of greenhouse impacts from stoves, funded by the Shell Foundation. The study will have a particular emphasis on non-CO₂ greenhouse gases (CH₄, N₂O, and others). These gases are more difficult to measure than CO₂, but the EECL's advanced measurement capabilities facilitate this work.

Charles and Marilyn Green Establish the J. T. Strate Endowment



Charles and Marilyn Green

J. Taylor Strate was professor and head of our department from 1938 to his retirement in 1964. He

led the department for 26 years through the transition of the Colorado Agricultural and Mechanical College to Colorado State University and the transition of the Division of Engineering to the College of Engineering in 1957.

To commemorate Professor Strate's dedication and service to his students, Charles (Chuck) Green ('58) and his wife, Marilyn, have established the J. T. Strate Endowment in the ME department.

The endowment provides scholarship support for ME students who are in their junior year and who demonstrate interest and aptitude in thermodynamics and in mechanical and electrical devices. They must have a strong belief in the free enterprise system, a GPA of 2.5 or better, and be working to help pay expenses.

There are many anecdotes about Professor Strate that paint a picture of a tough professor who demanded

a high level of performance from his students as well as from the faculty members of the department. One of those stories, as told by Bill Graves of the ME faculty from 1951 to 1976, indicates that Mr. Strate required the faculty to write on both sides of a sheet of paper, and he also required them to use "pencil extenders" that allowed the use of the last centimeter of each pencil.

Another professor in the mid-1940s, Harry Scofield, had a heart
(continued on Page 3)

Dr. H. G. 'Ollie' Olson Passes Away



Dr. H. G. Olson

Dr. Hilding Gunnar Olson, known affectionately by his friends and colleagues as "Ollie," died on Thursday, November 24, 2005, at the age of 83 in San Angelo, Texas.

Ollie was born on May 4, 1922, in Philadelphia, the third son of Swedish immigrants. He graduated from high school in Pitman, N.J., in 1939. In 1942, he received a bachelor's degree in mechanical engineering from the University of Pennsylvania. During the Second World War, he received his commission as a deck-engineering officer in the U.S. Navy, later earning his wings as a naval aviator trained for land and sea multi-engine airplanes. After the war, Ollie worked for several years as a professional engineer in the metals industry and then entered graduate school at the University of Michigan in 1958, specializing in nuclear engineering. While Ollie was a graduate student, he supervised the Phoenix Memorial Laboratory – a facility devoted to the peaceful use of the atom.

After receiving his Ph.D. in nuclear engineering in 1966, Dr. Olson joined the mechanical engineering faculty of Colorado State

University. In 1967, he served as acting head of the Department of Mechanical Engineering and taught courses in nuclear engineering and health physics. With another researcher and their graduate students, Dr. Olson pioneered the mathematical description and experimental verification of radioactive radon emanation from the Earth. He trained the staff and served on the safety board of the Fort St. Vrain Nuclear Generating Plant near Denver, Colo. He published numerous papers in professional journals describing the physics, start-up, and operation of the Fort St. Vrain reactor – the first-in-the-world commercial gas-cooled nuclear power reactor. His papers laid the technical groundwork for gas-cooled reactors that has been used widely for design considerations of new gas-cooled reactor systems.

Ollie was dedicated to his students and their professional success. One of his students, Ron Beethe, remembers that he was in the undergraduate nuclear engineering course Ollie taught at CSU. Even though he does not remember having any special interest in nuclear engineering or radiation before taking that class, Ron says, "It had an impact on me because shortly thereafter I was involved in a master's program focusing on nuclear engineering and health physics. I was pleased when my first position after graduate school was at the Phoenix Memorial Laboratory, a facility that Ollie had previously managed." Ron has gone on to have a successful career as an independent consultant in the area.

Ollie expressed the wish that his memory be honored somewhere in our gardens – to cultivate our plants, watch them grow, and share them with friends.

From the Department Head



Dr. Allan T. Kirkpatrick

Greetings from the CSU Department of Mechanical Engineering, and welcome to the Spring 2006 edition of *The Mechanical Engineer*. We are in the middle of the spring term, and the students are getting their projects ready for display and use in the various engineering society competitions. We had a successful "unveiling" of the new Formula SAE car in January, and it should be ready for events in May at the Formula SAE competition.

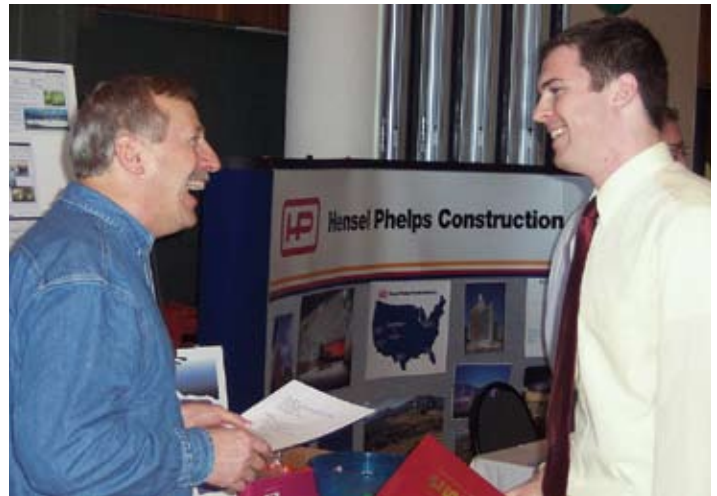
There are two upcoming campus events that I would like to bring to your attention. First, the Engineering Days/ME Senior Design Demonstrations are on Friday, April 14. We are always looking for volunteer judges for the E-days demonstrations. Second, the Engineering College is hosting the Engineering Alumni Awards dinner in Fort Collins on Saturday, April 22. This is a very rewarding event for all who attend, as CSU engineering alumni are recognized for their accomplishments.

Your continuing support of our students and our programs is greatly appreciated. I would like to report to you that over the last five years, the number of donors to the department has more than doubled from 216 to 495. Our programs are stronger and more relevant with your support.

Finally, we have had excellent response to our program for alumni to make presentations to Senior Design and to the ASME student chapter about various professional engineering topics. Please contact me at allan@engr.colostate.edu if you are interested in increased campus involvement with our students.

Allan Kirkpatrick

Dr. Allan T. Kirkpatrick



Student interacting with Career and Internship Fair representative (see story on Page 3).

Calendar of Events



Student Competitions:

- 4/22-25 US Open RoboCup Rescue Robot League
Atlanta, Ga.
- 4/28-30 ASME Human Powered Vehicle
San Luis Obispo, Calif.
- 5/17-21 Formula SAE Race Car
Romeo, Mich.
- 6/1-3 SAE Aero Design West
Encino, Calif.
- 6/19-20 World Open RoboCup Rescue Robot League
Bremen, Germany

ME/College of Engineering/University Events:

- 4/1 Alumni Green and Gold Gala
Denver Marriott
- 4/14 E-Days and ME Senior Design Practicum Project Demos
- 4/14 MEAP Board Meeting
Room 214-216 Lory Student Center
- 4/22 Alumni and Friends Awards Dinner
Hilton Fort Collins
- 5/12 Undergraduate Commencement
Moby Arena

Charles and Marilyn Green Establish the J. T. Strate Endowment *(continued from Page 1)*

condition, and he complained that there was not a water fountain on the second floor of the ME building, where his office was located. He had requested many times that a water fountain be installed. Finally Mr. Strate gave him \$20 to purchase plumbing materials and install the fountain himself, which he did.

Another series of anecdotes come from Chuck Green, who was one of Professor Strate's students from 1953 through 1958. Chuck arrived on campus in a 1940 Ford convertible that he had purchased for \$45. He enrolled first in Light Construction and Marketing but soon changed to Mechanical Engineering and witnessed the institutional renaming to CSU and the change of the Division of Engineering to the College of Engineering. Money was always a problem, so he worked throughout his college career and had to take a nine-month break from school as well.

He discovered that engineering students had to study intensely and had very little time available for outside entertainment. He maximized the outside time available by never showing up in class if he had a solid "C" grade wired. He first met

Professor Strate at the beginning of his junior year when Professor Strate "pompously" informed his class of 30 thermo students that he graded on a curve. An alleged quote from Professor Strate: "If I were so fortunate to have 30 Einsteins in this class, the three lesser Einsteins would fail."

Chuck says that he was highly motivated and took two quarters of thermo from Professor Strate. In the second term, he worked really hard, turned in all the homework, aced the final exam, and got a grade of "C." In disbelief, he confronted Professor Strate with his graded final exam and explained that he had reversed the labeling on problems #2 and #3. Professor Strate replied that he could see that Chuck had answered correctly but said, "I will charge you for erasures – same grade."

Later that year, Chuck became in arrears on his tuition payments and, while walking to class, explained to a friend that this might be his last day in school because he could not pay the tuition. As they entered Old Main, Professor Strate asked Chuck into his office and handed Chuck an envelope containing a check for \$1,000 with an explanation that it was from the Max Stoltz

scholarship fund for "C" students. This kept Chuck in school, and he finished the last quarter with an "A" grade.

Chuck began his professional career at the Naval Ordnance Test Station in China Lake, California, where he became involved in rocketry and missiles. His co-workers

namics played an important role in his continued success at Rocket Research. He later formed his own successful companies on at least two occasions and just recently sold his last company, GT Development Corporation. Chuck is now retired and living on Vashon Island in Washington State.

He began to feel great respect for the efforts of Professor Strate to educate a young man who showed little regard or thankfulness for his professor's efforts. His teachings provided a basis for almost all of Chuck's subsequent professional success. Chuck inquired about the Max Stoltz scholarship and found that it never existed. The thought that Professor Strate used his own money to help Chuck has made him very grateful indeed. Chuck thinks that Professor Strate probably affected other students as positively as he affected him.

The Department of Mechanical Engineering is very grateful to Mr. and Mrs. Green for their generous support of our students. Chuck is hopeful that other alumni will be willing to add to the endowment, as well.

"J. T. Strate's teachings provided a basis for almost all of my professional success."

came from Cal Tech and MIT while Chuck came from CSU, but he found that he had great advantages over them. While they could look up the necessary equations in the "rocket bible" of the time, a book by Sutton, Chuck understood them more deeply; and he could derive those equations from scratch. He advanced rapidly, and by 1964, he was head of the Propulsion Technology Branch and project manager of a hovering rocket system project.

He moved to Seattle in 1964 to join Rocket Research Corporation. Again, his education in thermody-

Alumni Expertise Needed!!

The ME Senior Design Practicum needs assistance in the following disciplines:

Fastener Engineering
Computer Tools for Engineering Analysis
Composites
Manufacturing
Electrical Components
Electromagnetic Noise Interference
Project Management

If you are interested in joining a network of engineers that the students may call on for help, please contact:

John Farrell
E-mail: john.farl@aol.com
Phone: (970) 226-5945

With a minimal time commitment, it's a great opportunity to make a contribution to the ME department, mentor a young engineer, and maybe find a great new employee for your company!

Career and Internship Fair a Success!!



The Department of Mechanical Engineering joined the Departments of Civil Engineering and Chemical and Biological Engineering to host the fourth annual College of Engineering Career and Internship Fair on January 31, 2006, at Colorado State University.

More than 60 companies and agencies from across the United States, recruiting engineering majors for full-time positions and summer internships, participated in the event, which included 20 companies specifically seeking ME and biomedical engineering students. A total of 374 students attended the event – 102 of whom were MEs – and met with potential employers to gain insight into company culture and ask questions they may not feel free to ask during formal interviews.

Many companies report that the fair was very successful for them, and several companies already have arranged formal interviews with students who attended the fair.

If your company is interested in attending next year's Career and Internship Fair in January 2007, please contact John Haines, Engineering Career Liaison, at (970) 491-0716 or e-mail john.haines@colostate.edu.

Kathy Fosha puts learning to test as engineering intern at BMW

Kathy Fosha is a CSU ME senior this year, planning to complete her B.S.M.E. degree in May. She is clearly a leader and innovator who is destined for great things.

Kathy's father was an engineering faculty member at the University of Colorado at Colorado Springs, and he had professional contacts with the head of the Aeronautical Engineering program at the Technical University of Munich in Germany. The Munich aero program provides wind tunnel access to BMW for aerodynamic testing of automobiles, and Kathy and her father had the opportunity to visit there.

While there, their host mentioned that, if Kathy were interested, he had contacts at BMW

materials and manufacturing, design optimization, aesthetics, and the opportunity the profession provides to be creative. She also enjoys travel and the opportunity to interact in cultures outside the United States, and she was looking for an opportunity to work in a real-world engineering environment before completing her engineering degree. The opportunity to work at BMW in Germany fit her interests perfectly.

Her work at BMW involved developing the cooling airflow system for a prototype hydrogen car that could provide the basis for a future production automobile.

She says, "It started with a rough vehicle shape, and BMW wanted me to develop a working cooling system that was unique

used it to pitch our concept to the executive board, to tell them that this is what we developed and that this concept should be used to build cars. Their response was really

"It was really great to see that the things I learned in school were important and useful in the workplace."

positive and satisfying. The thing worked, and it worked well, and the board said that it was even better than current BMW technology."

Kathy says, "It would be awful to slave away in an engineering degree program and then get out in the workforce and realize that you hate the work. My work at BMW was a great confidence builder. It was really great to see that the things I learned in school were important and useful in the workplace. That gave me motivation when I came back to CSU – motivation to work hard and study because I knew that what I was learning would be important in the future. When a company sees that you have previous work experience, it sets you apart from other graduating seniors. It lets you start a career and find out if that is the right direction in which to go before you get stuck, and it gives you a feel for how things correlate between your education and your work."

Kathy is currently the team leader for the FSAE Race Car Platform team. Two weeks ago, her



Kathy Fosha



Kathy Fosha and sail plane

and could put in a good word for Kathy to engage in an engineering internship in Munich. Kathy pursued that opportunity with BMW, and in March 2004, Kathy started her internship at BMW and worked there as an engineer for nine months.

Before traveling to Germany, she began studying German, the language of engineering at BMW, and chose to undertake a minor in German along with her B.S.M.E. program.

So why did she develop the interest in cars and BMW? Kathy has long been interested in the aerospace and aeronautical areas and is in fact a licensed sail plane pilot. The wind tunnel aspects of the BMW work on automobiles at the Technical University of Munich fit well with her aeronautics interest.

She enjoys the technical aspects of mechanical engineering as well as people interaction, leadership activities, the integration of mate-

and that brought attention to the cooling system. It was developed using CFD (Computational Fluid Dynamics) computer simulations and wind tunnel testing.

"The project was a partnership between the aerodynamics and design departments at BMW, and it was really fun because we were able to mix technical aspects with functionality to create the design of the car."

She started with a foam model of the car and went through three wind tunnel models, changing the shape to satisfy the requirements of aerodynamic drag as well as cooling. Each model was digitized to provide a database, and as each model was tested in the wind tunnel and modified, it was again digitized.

"The final product was really cool to see," she says. "It was a presentation model, made from molded plastic, painted, and had Plexiglas windows and real headlights. We

team "rolled out" the 2006 FSAE Race Car, and testing has begun, well in advance of the race to be held June 14-17, 2006, in Fontana, Calif. The car is running well so far, but there is lots of testing yet to be done. It is quite a trick to test the car enough to work out the bugs but not so much that it will break during the competition. Kathy and her team can handle it – they are real engineers.

So, what is next for Kathy? She is studying French now and plans to work in industry for a while. She is already considering opportunities with BMW, Northrup-Grumman, and Lockheed-Martin, and she hopes to pursue a master's degree later on.

Keep up the good work Kathy; you are making your professors proud.

"Class Notes" will be featured in a future issue of
The Mechanical Engineer.

Share Your News!

We enjoy hearing from our alumni. Please help us celebrate your personal and professional accomplishments by sending your update to:

SupportEngineering@colostate.edu

You also may fax your update to (970) 491-3815 or submit your news online at:

www.supportEngineering.colostate.edu
(click on "Alumni")