

### ME Department Leadership to Change



Allan T. Kirkpatrick & Susan P. James

The ME Department leadership is being passed on. Dr. Allan T. Kirkpatrick, the ME Department head for almost 10 years, recently announced that he will leave the position at the end of his second term and return to a regular faculty appointment. Effective July 1, 2010, the new department head will be Dr. Susan P. James, an ME

faculty member since 1994. During Kirkpatrick's tenure as department head, nine new faculty members have joined the department and have really "taken off", Kirkpatrick said. It has been a delight working with them and seeing the departmental programs grow, strengthen, and improve, he said. He is also proud that he has hired all of the current staff members who keep the day-to-day business moving along efficiently and with high quality. Kirkpatrick takes pride in the ME Senior Design Practicum program and is very pleased that he has been able to establish a stable funding level for the program and to encourage continued faculty support and interest in the practicum. He, the faculty, and the Mechanical

Engineering Advisory Panel, all value the practicum very highly because of its important role as a capstone for practical, hands-on mechanical engineering in the education of our students. He is also proud that he was able to focus the activities of the department over the past 10 years in three areas: energy, bioengineering and materials. The research contract and grant activity has about doubled during his supervision. As he always has, he credits the faculty for this accomplishment.

Kirkpatrick hopes to be in the classroom more and, among other courses, will teach the heat transfer and internal combustion engines courses. He says that he will be easy to find because his new office will

be only 30 feet to the north of his current office. So, when you are on campus, he would like you to stop by and say hello.

James is excited and looking forward to her new position as ME Department head. She feels that Kirkpatrick has done a great job and she plans to maintain the primary directions of the department for the immediate future, with a few twists of her own. James believes the department has great strength, a great legacy, and a strong alumni base. She is especially pleased with the alumni support of the ME Senior Design Practicum and wants to see that continue. She would also like to see more scholarships available

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### Brett Anderson Takes CSU Advancement Position



Brett B. Anderson

On Nov. 1, 2009, Brett Anderson, B.S.M.E. 1987, accepted a position at Colorado State University – Vice President for University Advancement. His responsibilities include oversight of fundraising for as well as the Alumni Association and the CSU Division of Public Affairs,

which includes marketing, communications, and public relations. Anderson says that this new position allows a broad and coordinated approach to fundraising and building lasting relationships with CSU alumni, corporations, foundations, media, and friends.

You may recall that Anderson has been a strong and long-standing supporter of the ME Department, as well as Colorado State University-at-large for many years. He is among the original members of the Mechanical Engineering Advisory Panel that has provided very important input to the continuous quality improvement program in our department. He worked in Denver for many years with Accenture Inc., a large

international management and technology applications consulting firm, retiring in March 2008. After his retirement, he worked on a part-time basis on the CSU "Denver Initiative" aimed at increasing awareness and engagement in CSU among alumni, industry, media, and friends.

One of his primary goals in the new position is to ensure the success of the recently announced \$500 million Comprehensive Campaign. He reports that \$320 Million has already been raised and that the campaign continues with strong momentum. His approach is to encourage people to come together and work as a team to achieve the goal. He says there are a lot of great people among CSU alumni, industry, and friends, who

demonstrate a tremendous loyalty and strength in support of CSU. His hopes are high for continuing the success that is already evident.

CSU is Anderson's passion and he is thrilled to be providing this kind of support for CSU on a full-time basis now that he has started working in his new position.

Please join us in congratulating Anderson on his new position in support of the continued success and strength of CSU. To learn more about the comprehensive campaign or make a contribution, please visit <http://www.news.colostate.edu/Release/4917> and [www.campaign.colostate.edu](http://www.campaign.colostate.edu).

## ME Mentors Program



Laura Ruff, Amy Hermundstad, Chriselda Engel, Katie Ulrich, and Stacey Jonett

Beginning with the Fall 2008 term, Chriselda Engel, the ME academic adviser, initiated an ME Mentors Program. The mentors are ME undergraduate seniors who provide tours for prospective ME students and their families, as well as participate in events such as Ram Welcome and other student functions. This program has enabled the department to continue to provide high-quality advising to more than 600 ME undergraduate students and to be able to recruit and retain top engineering students. Shown below are the ME mentors and the ME freshmen at a recent event.



ME mentors and freshman engineering students at fall social event

## From the Department Head



Dr. Allan T. Kirkpatrick

Greetings from Fort Collins! I have been writing these notes since the fall of 2001, and we have been publishing the newsletter since the spring of 1998. As the lead article indicates, I will be stepping down as department head at the end of this June, and Professor Susan James will be the next department head. She is a very accomplished educator and scholar, and the leadership of the department will continue to be in good hands. My intent is to be active as a professor, teaching and doing research in the thermal sciences.

I also will be helping lead the American Society of Mechanical Engineer's project entitled Vision 2030 – Creating the Future of Mechanical Engineering Education. This international project is aimed at increasing the global competitiveness of our mechanical engineering graduates. With this project, ASME is incorporating some of the improvements that you as CSU ME alumni have recommended and we have implemented in the department in the last ten years – increased practical experience, adding a design spine with a yearlong senior design capstone course, and increased focus on hardware development, testing, communication and teamwork. We have taken your suggestions, implemented them locally, and now we are disseminating them nationally!

It has been a pleasure to represent the department over the last ten years at alumni meetings, making visits to alumni at work and home, and learning more about your accomplishments since graduation.

Best wishes,

Dr. Allan T. Kirkpatrick

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. Send your update to:

**E-mail:** [SupportEngineering@colostate.edu](mailto:SupportEngineering@colostate.edu)

**FAX:** (970) 491-3815

**Web online:** [www.supportEngineering.colostate.edu](http://www.supportEngineering.colostate.edu)  
(click on "Alumni")

## Calendar of Events

### Student Competitions

4/23	ASME Human Powered Vehicle Northridge, Calif.
4/30	SAE Aero Design East Fort Worth, Texas
5/3	Formula SAE Hybrid Loudon, N.H.
6/16	Formula SAE Race Car Competition Fontana, Calif.

### ME/College of Engineering/University Events:

4/15-16	E-Days and ME Senior Design Practicum Project Demos
4/16	MEAP Board Meeting Lory Student Center 214-216
5/14	Undergraduate Commencement Moby Arena

## Dr. Paul Wilbur Retires



*Dr Paul Wilbur, a little before CSU*



*Dr. Paul Wilbur, 2010*

Prior to starting his Ph.D. studies in 1964, Paul Wilbur was interviewed by U.S. Navy Adm. Hyman Rickover and spent four years working as a nuclear power engineer. He joined the Colorado State University Department of Mechanical Engineering in September 1968, coming to us from Princeton University where he had finished his Ph.D. in aerospace and mechanical sciences with a focus on the physics involved in electric propulsion for space applications. He joined CSU to support our new program in electric propulsion and it was not long before Wilbur became a central figure in the program.

He found in our department a large vacuum tank, that had been imported from NASA Lewis Research Center, and installed and tested at the CSU Engineering Research Center by Virgil Sanborn and Lionel Baldwin. The tank provided the basic research equipment needed to undertake studies of ion propulsion systems and, by 1969, Wilbur had received funding from NASA and had begun research. He maintained an excellent record of research funding with almost continuous funding from NASA over his entire time at CSU, and funding from other sources as well.

His research went beyond ion engines for space application, extending to, for example, ion implantation to improve friction properties of bearings and to improve surface characteristics of a variety of materials through implantation of ions. Together with his students and co-researchers, he has produced more than 270 research articles, which have

appeared in prestigious journals and conference proceedings.

From the beginning, Wilbur's work has had an intense focus on students, both graduate and undergraduate, their learning, and their success throughout their careers. He is also very proud of his 42 years of research accomplishment that have led to clarifying and explaining basic physics, theoretical modeling, performance prediction, experimental validation of the models, and development of practical design capability applicable to ion propulsion systems.

Wilbur is known for the high quality he has brought to his courses, which include Energy Conversion, Introduction to Thermal Sciences, Broad Beam Ion Sources, Space Propulsion, Aeronautics ME Senior Design, and others. It does not matter which course he is teaching, or whether it is an undergraduate or graduate course, he generates a high level of enthusiasm that is infectious. His students do well, and they have high regard for Wilbur. He is very deserving of the accolades he receives from his students and the faculty for his excellent record in the classroom.

For example, it was in the early 1970s around the time of the Arab oil embargo, that Wilbur guided a group of senior undergraduate students on a project to build and operate the STAB car that ran on methanol. It competed in a national competition aimed at developing alternate fuels and showed Wilbur's capability to work successfully with students on an important problem and to produce a successful outcome. Of course the

car had its problems, such as starting. They used propane to get it going and the fuel dissolved the fuel lines and the carburetor. The students learned a great deal about how to design and build something that would actually operate.

Wilbur's awards and recognitions include the CSU Halliburton Award for Excellence in Teaching; the CSU Oliver P. Pennock Award for Distinguished Service; the CSU George T. Abell Faculty Research and Graduate Program Support Award; the CSU Engineering Dean's Council Award; the Electric Rocket Propulsion Society Medal (Stuhlinger Medal) for Outstanding Achievement in Electric Propulsion; and the Wyld Propulsion Medal from the American Institute of Aeronautics and Astronautics. In addition, he is a life fellow of the American Society of Mechanical Engineers and an associate fellow of the American Institute of Aeronautics and Astronautics.

Wilbur said that the accomplishment of which he is most proud is the

career success of all of his students. They have become the technical leaders and/or presidents and CEOs of the companies that have built the many ion propulsion systems and ion sources that are operating today.

What he remembers from his time in the CSU ME department is "students who were committed and involved in their work and a faculty that was compatible, diligent, competent, and committed to helping each other." He advises our faculty to "maintain those same qualities and continue to enjoy the same level of happiness in doing your work that I have had."

His plans for the coming years are to "work on that 42-year honey-do list that (his wife) Twyla has generated, visit my grandchildren more, and do more work in our church."

We will miss Wilbur and hope that we will see him around from time to time. Please join us on April 30, 2010, at the Lory Student Center University Club for Wilbur's retirement reception.

## ME Department Head Change

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to new freshmen who are applying to Colorado State University for an ME major. The ME Department has seen record growth in undergraduate enrollment over the past 10 years. Accordingly, she thinks it will be necessary to improve the student/faculty ratio. She plans to do that for the short term by continuing to hire part-time instructors who are experienced industry practitioners of mechanical engineering. Another factor that is likely to cause further increases in enrollment is an anticipated undergraduate degree in biomedical engineering. The ME graduate program needs some work to "re-brand" it to improve graduate student recruiting, and James indicates the department needs to work on soliciting more graduate student fellowships and traineeships. In particular, she hopes we can increase recruitment of Ph.D. students.

James would like to increase the diversity of the faculty and student body. While great increases in diversity have occurred over the past

10 years, the situation has stagnated somewhat in the past few years, and James will work on making the ME profession more attractive to women and minorities.

James also says the department is in need of significant new space for teaching and research laboratories that the new building would provide. The new students and the new faculty in the department have brought significant pressure on space in our current building. For example, some undergraduate teaching labs have been reduced in size to accommodate new faculty research space, as well as growing space needs in other undergraduate teaching activities.

Finally, James plans to keep up her own research and teaching. She particularly enjoyed the challenge of keeping her research programs going strong during her prior administrative jobs at CSU.

Please stop by the department to say hello to Dr. James and congratulate her on the new position.

## ME Faculty Awards and New Projects

The ME faculty members continue to be active and productive. Following are a number of awards received and new projects started by the faculty.

Professor Azer Yalin received the Ralph R. Teetor award from the Society of Automotive Engineers. Reflecting the firm belief of its donor that engineering educators are the most effective link between engineering students and their future careers, the SAE Ralph R. Teetor award is focused on younger engineering educators. Its objective is to provide an engineering atmosphere in which these teachers can meet and exchange views with practicing engineers. See the full story at: <http://www.news.colostate.edu/Release/4808>.

Yalin and his co-researchers in the Engines and Energy Conversion Laboratory, housed in the ME Department, have also been very busy developing patentable technology for engines of the future. Three patents they recently received:

- Patent #7420662 – Yalin, Bryan Willson, Morgan DeFoort, Adam Reynolds, Sachin Joshi - *Optical diagnostics integrated with laser spark delivery system*
- Patent #7340129 – Yalin, Willson, DeFoort, Joshi, Reynolds - *Fiber laser coupled optical spark delivery system*
- Patent #7412129 – Yalin, Willson, DeFoort - *Fiber coupled optical spark delivery system*

Professor Tom Bradley was recently awarded two grants. One is a Transportation Electrification Education grant from the U.S. Department of Energy to develop educational programs in the field of transportation electrification dealing with hybrid and other electric vehicles. Bradley is the technical lead

for the \$5 million project and principal investigator for the \$700,000 sub-award to the CSU College of Engineering. See the full story at:

<http://www.news.colostate.edu/Release/4733>.

Bradley also received a \$917,000 grant titled "Micro-Cooling Systems for Firefighters: Super Critical Air Merged Purifying Respirator with Electric Refrigerator," from the Department of Homeland Security, to study the development of equipment to reduce heat stress in firefighters and hazmat workers. Bradley is the PI with Wade Troxell and John Williams as co-PIs. See the full story at: <http://www.news.colostate.edu/Release/4842>.

Professor Anthony Marchese received part of a \$44 million grant awarded to the National Alliance for Advanced Biofuels and Bioproducts consortium. It is a multistate, multi-institution, multi-corporation collaborative effort that includes the Los Alamos National Laboratory. The purpose is to advance the state-of-the-art industry in algal biofuels. Marchese is the PI for the \$1.25 million CSU component of the consortium and is the consortium team leader for the fuel conversion/characterization area. Marchese, with a number of co-researchers at CSU and the Engines and Energy Conversion Laboratory, also will continue his work on algae-based biofuels. See the full story at: <http://www.news.colostate.edu/Release/4977>.



Thomas Bradley



Azer Yalin



Anthony Marchese



Bryan Willson

Marchese and Yalin recently received a \$324,268 National Science Foundation grant for combustion chemistry of algal biofuels entitled "Effect of Chemical Structure on Pollutant Formation Kinetics in Algae-Derived Biofuel Combustion." This study will examine homogeneous compression ignition and partially premixed droplet ignition of straight algal oil, algal methyl esters, and algal renewable diesel. Each of these fuels will be derived from algal bio-crude, which is currently being developed by Solix Biofuels Inc. and others. By performing combustion and pollutant formation studies in parallel with development of the algal bio-crude, it may be possible to tailor the production of the algae to produce a low-polluting, algae-based biofuel.

Professor Bryan Willson received the Village Earth Maurice L. Albertson Medal in Sustainable Development for his work on global environmental problems. His leadership and work at the Engines and Energy Conversion Laboratory, housed in the ME Department, on inexpensive pollution-reduction systems for small two-stroke gasoline engines and on low emission cook stoves was cited as very important in the developing world. See the full story at: <http://www.news.colostate.edu/Release/4761>.

Willson, co-founder of Envirofit International, Inc., and Solix Biofuels Inc., joined President Barack Obama, Microsoft's Bill Gates, and New York Mayor Michael Bloomberg in the first "Scientific American 10" honor roll for innovations that benefit humanity. The honor roll appears in the June 2009 issue of *Scientific American*. See the full story at: <http://vpr.colostate.edu>.



W.S. Sampath

Professors W.S. Sampath and V. Manivannan have been awarded an NSF Industry & University Cooperative Research planning grant to foster relationships between universities and industries to advance photovoltaic technology.

Sampath recently received an Innovative Excellence Award from the Colorado State University Research Foundation and CSU Ventures for his role in creating Abound Solar, a growing solar module manufacturer with more than 250 employees along the Front Range.



V. Manivannan

