the mechanical engineer

Colorado State University

Department of Mechanical Engineering

Fall 2009 www.engr.colostate.edu/me Volume 12, Number 1

Lakshmi Prasad Dasi Joins the ME Faculty

Professor Lakshmi Prasad Dasi

Flows that are driven by life; flows that sustain life; flows that are external to living organisms; flows that are internal to living organisms; these are descriptors of the multidisciplinary research activities that interest our newest ME faculty member, Dr. L. Prasad Dasi. He joins us from Georgia Tech where he spent the last 10 years engaged in teaching and research while he pursued his M.S. and Ph.D. degrees in Civil and Environmental Engineering, with emphasis on fluid turbulence and mixing, followed by post-doctoral training in interdisciplinary cardiovascular fluid mechanics.

Dasi has arrived on campus with his wife, Kranti, and two daughters, Anoushka and Annora. We are excited to welcome him to the ME faculty and hope you will have the opportunity to meet him soon.

He has teaching experience in topics such as Hydrodynamic Instability and Turbulence, Biofluid Mechanics, Hydraulic Engineering, Statics, Dynamics, Fundamentals of Fluid Mechanics, and Structural and Solid Mechanics. He also comes with teaching experience from the Georgia Tech biomedical engineering undergraduate program's cornerstone freshman course of Problems Based Learning where young and fresh minds are shaped to tackle the highly interdisciplinary problems that future engineers will face – e.g., designing a bionic hand, or developing advanced screening protocols for cancer detection.

Dasi's research experience has revolved around experimental and computational investigations of flows in and around prosthetic heart valves as well as congenital heart defects such as single ventricle physiology. He has also had significant experience working with industry collaboration on biofluid mechanics projects involving heart valves under development for clinical application.

He has more than 70 publications and conference presentations including more than 25 refereed journal publications in journals such as Physics of Fluids, the Journal of Biomechanics, the Journal of Fluid Mechanics, the Journal of Engineering Mechanics, the Journal of Thoracic and Cardiovascular Surgery and many others. He has

(continued on Page 3)

ME Lab Updated with Support from Joe Marcus

The ME Shop, renamed the Manufacturing Instructional Laboratory (MIL) in 2001, has a strong emphasis on fabrication techniques and manufacturing skills and a high level of accessibility for our students. Dr. Steven "Doc" Schaeffer has led the effort to improve the shop and he has done an outstanding job of that since his arrival in the ME Department in August 2001.

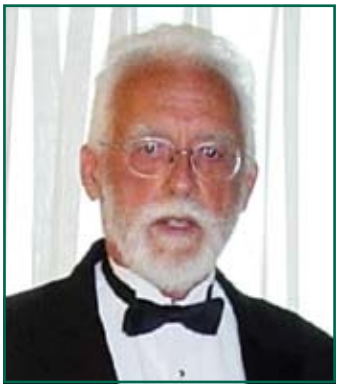
ME alumni Joe Marcus strongly supports the hands-on experiential engineering education that Colorado State ME students receive. Marcus and his wife, Carolyn, recently provided funds to purchase a new CNC tool-room lathe, a Haas TL-1, one of the best of its kind available in the world today. The new lathe will enhance student learning because parts can now be designed and produced that could not easily be made on our conventional lathes. Also, multiples of the same part geometry can be produced much faster and to a higher level of accuracy than previously possible in the MIL. In the words of one of our undergraduate students, "We need more people like Joe Marcus because this has really improved the MIL!"

Marcus graduated with a B.S.M.E from Colorado State in June 1961. He said that money was so tight prior to graduation that he knew it was prudent to graduate on Saturday, June 10, and go directly to work on Monday, June 12, at the Martin Company in Denver. He spent his entire 42½ year career in the aerospace industry at Martin, which later became Martin-Marietta, and

Dr. Allan Kirkpatrick, Dr. Steven Schaeffer and Mr. Joe Marcus in the Manufacturing Instruction Lab

(continued on Page 4)

Charles J. Green Passes Away



Charles J. Green

It is with sadness that we inform you that an ME alumnus, Mr. Charles "Chuck" Green died of cardiac arrest and complications on May 24, 2009, at his Corbin Beach home in Vashon, Wash. Chuck Green was born July 2, 1935, in Berwyn, Ill., the last of five children born to Fred Paul and Janet Green, both deceased. He graduated from Colorado State with a B.S.M.E. in 1958.

Chuck Green and Marilyn Bottenfield were married June 8, 1958, in Idaho Springs, Colo. They made their home on Vashon Island, Wash., in the mid-'60s. Green worked as a civilian engineer at China Lake Naval Ordnance Test Station, Calif., for six years, and for the Rocket Research Corp., Kirkland, Wash., for a few years. He started Vashon Industries, a model rocket company, with Alan Forsythe. After its sale, Green and Forsythe opened a consulting engineering firm, Green Forsythe, with an office in Pioneer Square that became GT Development which thrived from 1976 to 2005. Green was President and CEO; the firm was sold in 2005.

Among his many accomplishments, Green's name is on nearly 40 patents. He also served on the Vashon School Board, was a member of Quartermaster Yacht Club, the Sportsman's Club, Sandy Beach Community, and was a professional engineer.

He enjoyed all things mechanical, especially working with his hands, and was involved in a wide variety of crafts, from carpentry to stained glass. He had a talent for putting things together, both physically and mentally. Everything in his life became a story – thousands of stories – that he told with delight. He enjoyed his family, friends, skiing, sailing, trips on his Harley, and learning, in retirement, to play the piano.

He is survived by his wife Marilyn of Vashon, Wash., son Charles Jeffrey (Chick) of Vashon, Wash.; daughter Leslie Alison Carda of Roswell, Ga.; son James Conrad of Eatonville, Wash.; four grandchildren; three step-grandchildren; a brother Fred Green of Castle Rock, Colo.; a sister Phylis Goodridge of Western Springs, Ill.; and numerous nieces and nephews. For friends who may wish to make a charitable donation in his memory, the family suggests either the Union Gospel Mission of Seattle or the Professor J.T. Strate Scholarship Fund, which Green established at Colorado State University in 2005.

From the Department Head

Dr. Allan T. Kirkpatrick

Greetings from the Mechanical Engineering Department! Classes are now under way, and again we have a record number of new freshmen – 155. The increase is due to a large increase in out-of-state students, now up to 30 percent of our freshmen enrollment. This gives our department strong geographical diversity.

In this newsletter, we have a variety of articles about events in the ME Department that I hope you find interesting. We were successful in hiring Dr. Prasad Dasi as a new mechanical engineering faculty member this year. Professor Dasi joins us from Georgia Tech and has expertise in biofluids, with specific interest in prosthetic heart valves. More information about Dr. Dasi is given in the lead article. Also, I regret to report that Chuck Green, B.S.M.E. '58, passed away this spring. Chuck Green was a strong supporter of our undergraduate program.

Last spring, our senior design teams performed at a very high level, winning and placing in national competitions. Our ASME Human Powered Vehicle team won first place in the utility division, and the Formula SAE Hybrid team placed second in their competition. We had 20 senior design groups working on a wide variety of challenging problems. In addition to the competition teams, we also had groups working on projects such as algae-based biodiesel, humane fawn capture, and a neonatal transport incubator. Your continuing support of our students, particularly the senior design program, makes our participation in these events possible. Thank you and best wishes for the fall.

Allan Kirkpatrick

Dr. Allan T. Kirkpatrick

Formula SAE Hybrid Team
Louden, N.H., May 2009

ASME Human Powered Vehicle Team
Portland, Ore., May 2009

Calendar of Events

Student Competitions (dates/locations to be announced):

- SAE Aero Design West
- ASME Human Powered Vehicle
- SAE Formula Hybrid Competition
- Formula SAE Race Car Competition

ME/College of Engineering/University Events:

10/8 Annual 50th and Prior Reunion Dinner
Fort Collins Hilton

10/9 COE 50th and Prior Reunion Breakfast
Internet Café/Engineering Building

10/9 MEAP Board Meeting
Lory Student Center 214-216

12/19 Fall Undergraduate Commencement
Lory Student Center Main Ballroom

4/10 Alumni & Friends Awards Dinner
Fort Collins Hilton

4/16 Engineering Days/ME Senior Design Practicum Project Demos

4/16 MEAP Board Meeting
Lory Student Center 214-216

4/30 Paul Wilbur Retirement Reception
Lory Student Center Cherokee Park & University Club, 3-5 p.m.

Robert J. Townsend Receives the ME Distinguished Alumni Award

Each year, the College of Engineering recognizes our former students whose career and service have brought honor to themselves, and to Colorado State. This year, Robert J. Townsend, B.S.M.E. 1985, received the ME Distinguished Alumni Award.

Townsend has been with Boeing since graduating from Colorado State. He is currently the chief engineer for the 747-8 Freighter Systems. During his tenure with Boeing, he has worked on many projects including the 777 Freighter Systems and the 767 Boeing Converted Freighters. In the capacity of systems chief engineer, he leads the integration of the airplane systems (Avionics, Electrical, Flight Controls, Hydraulics, Landing Gear, Environmental, Fire Protection, etc.) into the airplane. This includes overseeing the system architecture, software and hardware development, supplier performance, build, test, and certification.

Because of his strong technical and interpersonal skills and his ability to understand the value from the customer's perspective, Townsend has served as the Boeing representative numerous times with key customers and suppliers, including assignments at London-Heathrow airport and Hamilton Sundstrand. Townsend has also led the cabin comfort/cabin air quality team to improve passenger comfort and health. This team worked across the Boeing Co., as well as with United States Sen. Dianne Feinstein, the Air Line Pilots Association, the Association of Flight Attendants, and industry consultants.

Townsend's ME senior design project was a voice recognition system to control a robot and a CAD program to analyze various airfoil designs. He was active in music and had a voice scholarship. He engaged in lots of intramural sports, including tennis, racquetball, volleyball, and flag football and he worked as a "hasher" at Kappa Delta Sorority. His favorite professors were Dr. Robert Haberstroh and Dr. Paul Wilbur. He says his toughest professor was Dr. Haberstroh in Heat and Mass Transfer. His memory of a fun class is Physics because "we never knew what experiment was going to go awry – it kept us on the edge of our seats".

Townsend said, "The CSU ME department taught me to analyze problems in a logical fashion, I found that I did my best when I understood the theory behind the problem. In that way, I could break any problem down to the base elements and solve them one at a time. Also, our team approach to design projects prepared me for working in a collaborative design environment like Boeing."

Dr. Patrick Fitzhorn presents ME Distinguished Alumni Award to Mr. Robert J. Townsend

His advice to students: "Be patient with your career and enjoy the journey."

Townsend and his wife, Corky, have two children A.J., 14, and Cole, 11, and reside in Mukilteo, Wash., near Seattle. Corky Townsend is also employed with Boeing as Director of Aviation Safety. Townsend is an active volunteer with the Boy Scouts of America and Little League Baseball. In his spare time, when he is not building airplanes, Townsend enjoys volleyball and golf. He and his wife also enjoy diving together.

The College of Engineering is accepting nominations for the 2010 Distinguished Alumni awards. Submit nominations online at https://advancing.colostate.edu/ENG/DAAWARDS by Jan. 29, 2010.

Lakshmi Prasad Dasi *(continued from Page 1)*

presented papers on several occasions at the ASME Summer Bioengineering Conference. He is also a co-inventor on three patents pending on biomedical devices including a flow manipulation device for prosthetic heart valves.

Dasi has won several awards recognizing his excellence in teaching and in research, and he brings a wealth of teaching and research experience in a broad array of fields that will add measurably to the ME Department's emphasis in interdisciplinary Biomedical Engineering. He is also equipped to provide teaching support in the undergraduate ME curriculum. He plans to develop a new biofluid mechanics course to be offered in Spring 2010 for seniors and graduate students.

His goal is to lead a research laboratory that is tightly integrated with clinicians as well as medical device manufacturers. He hopes to advance the design of devices, from those as simple as needles and syringes to those as complex as heart valves implantable pumps and artificial hearts. His specific emphases will be in the areas of flow control and blood element biomechanics to address the problems of thrombosis complications that plague all blood-contacting prostheses; heart valve related devices; and ventricular assist using skeletal muscle energy.

Dasi is excited about joining the CSU ME faculty because this position provides a unique opportunity to pursue his interests in cardiovascular and biofluid mechanics. A strong mechanical engineering and biomedical engineering program combined with the resources of the CSU College of Veterinary Medicine and Biomedical Sciences, the Vet hospital, and local medical device industries provide the ideal breeding grounds to incubate his vision of next-generation cardiovascular medical devices.

NASA National Space Grant Meeting

Christina Watanuki (right) at the National Space Grant Directors Meeting in Washington, D.C.

Last spring, Christina Watanuki represented Colorado State and the Colorado NASA Space Grant Program on a trip to Washington, D.C., where she met with members of Congress to share her enthusiasm about space exploration and aerospace engineering. ME Professor Azer Yalin directs CSU faculty and student participation in the Colorado NASA Space Grant Consortium. "The Space Grant program provides opportunities for our CSU undergraduate students to conduct very exciting and worthwhile research," notes Yalin. Learn more about these projects at www.engr.colostate.edu and http://spacegrant.engr.colostate.edu.

International Summer Fellowship IIT 2009

For the third year in a row, Colorado State's College of Engineering International Summer Fellowship Program has provided seven students from the Indian Institute of Technology in Chennai, India, with a chance to gain research experience through a ten-week internship. As part of the collaborative project, students had the opportunity to work in several departments within the engineering college.

While learning about a new country and culture, students from a wide variety of engineering backgrounds worked on practical engineering applications such as molecular dynamics of thermoresponsive polymers, modification of membranes and temperature measurements using neural networks.

Organized by Professors V. Manivannan (ME) and V. Chandrasekhar (ECE), the program allows students the opportunity to gain real-world experience and prepare for continued studies in engineering fields. At the end of the ten-week program, the students' research project culminated in a presentation to the organizing professors.

"The summer internship is a great opportunity to expose students from India to top-class research done at CSU," said Manivannan.

While at CSU, students have the opportunity to interact with department faculty and staff, and spend time with other students participating in the Research Experiences for Undergraduates program, as well as others living and working on campus. Students also had the opportunity to explore the Front Range, visiting Lory State Park, Old Town and Rocky Mountain National Park where many saw snow for the first time.

The organizers would like to acknowledge the help of Dr. Allan Kirkpatrick and other engineering department heads, Dean Sandy Woods and program coordinator Karen Ungerer.

Summer IIT participants (left to right from top): Manish Sharma, Anubhav Bhattacharjee, Mmanu Chaturvedi, Himanshu Jasuja, Alaparti Pavan, Professor V. Manivannan, Griffith D'Costa, and Sujay Srivastava

Joe Marcus and the MIL *(continued from Page 1)*

now is Lockheed Martin. His first engineering job was in Ground Mechanical Systems on the Titan ICBM program. He then moved to Airborne Propulsion where he led a team that developed a new family of gaskets and seals for rocket tanks and feed-lines that had to reliably seal against leakage of stored propellants (nitrogen tetroxide - oxidizer and a hydrazine blend of fuel) which were both highly corrosive and hypergolic. These propellants were originally very difficult to seal, but the new replacement gasket designs eliminated the problem and were utilized until the end of the Titan program.

His next assignment was in New Orleans as the director of Manufacturing Engineering wherein the design of massive tooling and the creation of numerous processes to build, test, finish, and deliver the Space Shuttle external tanks for the NASA customer was the job.

He returned to New Orleans again 20 years later as the Vice President of Production Operations for the External Tank program until his retirement in 2002. He and Carolyn returned to Denver as soon as the Louisiana house was sold to rejoin the family (six kids and 12 grandchildren) and settled into full retirement.

"Doc" Schaeffer with the MIL's new CNC lathe

As an undergraduate in the ME Department, Marcus remembers with fondness the shop classes he had with Professor J.C. Dodge on casting, welding, and machining. He told me he really loved these classes and retained a significant amount of the details. He says that what he learned there helped him immeasurably in his years as an engineering designer and later as a manager of technical groups. Marcus says, "If you aren't fully immersed in all facets of fabrication - fits, finishes, tolerances, and assembly techniques, it is very difficult to produce a fully competent engineering design that will flow through the shop and make fully functional parts at a reasonable cost. You need that hands-on experience in order to really know what you can build and how to do it well." He spent a lot of his career interacting with the "shop guys" in order to be sure his designs were properly prepared.

Students perform many diverse activities in the MIL, which now has more than 30 fabrication machines including a paint booth and welding room. They also operate the CNC mills, any of the several lathes, grinders, band saws, and use the many hand tools. Most importantly, they learn the real-world, hands-on realities of engineering as they build projects they have designed.

Marcus said that his CSU ME education was invaluable to him during his engineering career. The Marcuses' support is also invaluable to the department's real-world, hands-on ME education our students receive.

Class Notes

William Ed Odell ('58) worked for Cutler-Hammer Motor Controls in Milwaukee, Wis., in their Corporate Sales Department. He was involved in sales support, writing proposals and sales aids for field sales in the newspaper industry, including printing press controls and mailroom equipment. In 1961, he worked for a small company selling processing equipment to milk processors, covering seven states, including Wisconsin, Minnesota, and Michigan. He later joined Modine Manufacturing Co. selling heat transfer products, including radiators, oil coolers, charge air coolers, and evaporators and condensers for air conditioning, for mobile markets. In 1983, as National Sales Manager for Davenport Machine in Davenport, Iowa, he provided dewatering and drying equipment to chemical and grain processing companies. He retired from Davenport in 1994 and returned to Colorado. He and wife, Carolyn, raised five children and have five grandchildren. They now reside in Glenwood Springs and since retiring have visited all 50 states, all seven continents and approximately 50 foreign countries.

Howard Ruddick ('59) retired in November 2000 after 29 years with West Point Foundry and Machine Company in West Point, Ga., a supplier of textile machinery to more than 80 countries. He filled various positions, including pressure vessel design, quality control, and customer service. He currently resides in West Point where he is restoring a 1928 Ford Model A.

Eduard Poser ('62) is retired and resides in San Anselmo, Calif. He enjoys hiking and has five sons - Kurt, Brent, Ted, Tom, and John, and three grandsons – Nick, 11, Charley, 20 months, and Eddie, 1 month. His career highlights include managing several large projects for Bechtel Corp. – several exceeding 700 technical persons, and managing two of their engineering departments.

Stephen Light ('68) is the chairman, CEO, and president of Xerium Technology Inc., (NYSE trading

symbol: XRM) since February 2008. Light and his family rang the bell at the closing of the New York Stock Exchange on Feb. 23, 2008 (see photo above). This event was a commemoration of the 10th year of Xerium Technology Inc., one of the world's largest producers of paper machine clothing and roll covers used by paper makers in the process of making all grades of paper from tissue to cardboard boxes.

Gary Kirkpatrick, P.E. ('76) and **Amber Wu Kirkpatrick ('08)** announced the birth of twin boys George and Gene, born on May 20, 2009.

John Stanford, P.E. ('81) was an NRC licensed Senior Reactor Operator for 12 years. He was in management at nuclear power plants for 11 years, including a few years as an operations manager. He has two children. Robyn, 20, has just completed her sophomore year at Rochester Institute of Technology. Nick, 18, has begun his studies at Cornell University. Both Robyn and Nick were honor roll students throughout high school. Stanford currently resides in Kewaunee, Wis.

Craig Tarr ('86) won the Focus on Energy Award for 2009 at the annual Midwest Renewable Energy Fair. This award is given annually to a renewable energy provider in the state of Wisconsin who best exemplifies the quality and level of service expected by Focus on Energy, Wisconsin's nationally recognized public benefits program. He is the founder of Energy Concepts that designed and installed

(with partner Steiner Plumbing/Heating/Electric) some of the most unique and groundbreaking renewable energy systems in Wisconsin and Minnesota.

Thomas Edwards ('89) currently resides in Naperville, Ill., with his wife and three children. He is the president and senior process engineer of Technics Inc., a supplier of test equipment and fluid handling systems in support of research and production activities in the ground vehicle industry, located in Darien, Ill.

Jeff Young ('89) and wife, Annie, have three children: Adrianna, 5, Siena, 3, and Oscar, 1. He is the principal of an apartment investment company.

Ben Stone ('98) and wife, Rebekah, currently live in Longmont, Colo., and will welcome their third child in October 2009 joining big brothers Caleb, 4, and Kyler, 2. Stone is a senior mechanical engineer at Ball Aerospace and Technologies Corp., in Boulder, Colo., designing electronics packaging solutions for satellites.

Dave Burns ('99) became father of a daughter, Sydney, on Dec. 23, 2008. He resides in Kapolei, Hawaii.

Andrew Burroughs ('00) received his Air Force commission in 2000 and earned his navigator wings at Randolph Air Force Base, Texas. After navigator training, he transferred to Offutt Air Force base, where he trained as an electronic warfare officer on the RC-135 RIVET JOINT. He flew for four years as an EWO, deployed five times (four to the Middle East) and upgraded to Instructor EWO before being selected for Undergraduate Pilot Training. In 2005, he left Offutt for Columbus Air Force Base, Miss. where he earned his pilot wings. After UPT, he returned to Offutt as an RC-135 pilot, and has been there since 2006. He deployed twice to the Middle East as a pilot, earning the Gen. Jerome F. O'Malley award for the No. 1 Reconnaissance Crew in the Air Force for 2007, upgraded to Aircraft Commander, and is currently serving his third Middle East deployment as an A/C. He plans to pin on the rank of major in 2010. He is studying for a master's degree in Space Studies, has applied for Test Pilot School, and is planning on applying to NASA as well. He married his college sweetheart, **Cathy Wlezien ('02)**, in 2004. When not deployed, he likes to restore older cars.

Dan Sweeney ('03) currently resides in Salt Lake City, Utah. He is currently working on his Ph.D. in mechanical engineering at the University of Utah. His Ph.D. research in the Institute for Clean and Secure Energy focuses on biomass residue gasification. Following his Ph.D., he hopes to continue working in academia and teach at a university. He is active in the Acoustic Guitar Club, organizing several live concerts on campus, and is involved in a group that successfully sponsored a Sustainable Campus Initiative which utilized $5 of student fees per student to fund sustainable campus projects. He is also the team leader for the Engineers Without Borders chapter and volunteers in the Salt Lake community introducing elementary school students to engineering and science-related projects, and volunteers at a local botanical garden where he gives tours to visiting student groups and helps organize garden concerts. He enjoys Utah's skiing, mountain biking, hiking, and climbing.

Chad Olsen ('06) is a project engineer/developer for Constellation Energy Projects and Services Group, located in Boston, Mass..

Kyle Siler-Evans ('06) joined Teach For America and spent two years teaching ninth-grade algebra in Baltimore, Md. He then finished his first year of a Ph.D. program in engineering and public policy at Carnegie Mellon University.

Caleb Brown ('08) is working for the Forest Service on an interagency hotshot fire crew in Arizona in the summer, and traveling in the winter.

2008/2009 Senior Design

Humane Fawn Capture Senior Design Team

Algae-Based Biodiesel Senior Design Team

SAE Aero Design Senior Design Team

Neonatal Incubator Transport Senior Design Team

2009-2010 ME Scholarship Recipients

Scholarship Name	Recipient
George T. Abell	Caylee L. Johnson
	Markus M. Lutz
Advanced Energy-Hollis Caswell	Isaiah S. Franka
	Matthew D. Fox
Melvin R. and Mary Lou Black	Hannah K. Hudson
Engineering Scholars	Steven A. Isaacs
Walery Richard Gawronski Memorial	Isaiah S. Franka
Ival V. Goslin	Sean T. Albertson
	John K. Knight
	Allison L. Kotewicz
Guire Family Memorial	Nicholas R. Gruber
Edward B. House	Joseph D. Gerdom
Graham W. Howard Memorial	Eric S. Dischinger
Kirkpatrick Family	Laura M. Ruff
Myron B. Ludlow	Kasey A. Ackerman
Mechanical Engr. Alumni/Faculty	Jennifer E. Lee
Micro Motion Engineering	Ryan J. Kindt
	Ryne M. Waggoner
Charles E. Mitchell	Matthew J. Wenger
Robert Mock Memorial	Timothy M. Campbell
	Ryan M. Sullenberger
A. J. Parfet	Nicholas P. Echter
Robert L. and Bonnie J. Walker	Amanda N. Marchiani
	Ryan J. Slinger
Delano F. Scott	Adam C. Klopp
	Bryce M. Berchenbriter
Walter Scott	Gregory J. Broughton
	James W. Howland
	Zachary D. Simson
Shrake Culler	Joshua R. Garrett
Sjostrom Family	Gregory C. Schroll
J. T. Strate Educational	Laura J. Davis
C. Byron and Donna T. Winn	John B. Coughlin
Claude W. Wood	Seth L. Davies
	John B. Coughlin
	Laura M. Imbler
	Austin L. Jurgensmeyer
	Bruce A. Mayberry
	Nathan J. Petter
	Shawn D. Salisbury
Hans Kurk Zimmerman	Justin D. Nelson

You are cordially invited to a reception honoring

Paul J. Wilbur, Ph.D.
Professor of Mechanical Engineering

41 years of service at Colorado State University

3:00 p.m.-5:00 p.m., Friday, April 30, 2010
Lory Student Center Cherokee Park
Colorado State University

Please send items for Dr. Wilbur's "memory book" by April 1, 2010 to:
Carol Sarantos, Mechanical Engineering Department, 1374 Campus Delivery,
Colorado State University, Fort Collins, CO 80523-1374
Email: carol.sarantos@colostate.edu