NEWSLETTER FOR ALUMNI, FRIENDS & STUDENTS

FALL 2001/WINTER 2002

THE STREAMLINE

AEROSPACE ENGINEERING, MECHANICS & ENGINEERING SCIENCE

DYNAMICS AND CONTROL IN AEMES : RAPID GROWTH

Overview

The Department of Aerospace Engineering, Mechanics and Engineering Science (AeMES) has moved aggressively over the past few years to develop a nationally recognized research program with broad expertise in dynamical system theory, control theory and experimental dynamics. The AeMES Dynamics and Control Group is comprised of four full time faculty members and over 20 graduate students. Current research projects consider open questions in acoustics, aeroacoustics, aeroelasticity, flow control, robotics, automated rapid retargeting, trajectory tracking control, vibration modeling and suppression, and spacecraft dynamics and control. The projects are supported by a variety of institutions including the Office of Naval Research, the Air Force Office of Scientific Research, the Army Research Office, the NASA Langley Research Center, Eglin Air Force Base, Boeing Company, Pratt and Whitney Corporation, and Lockheed Martin Tactical Aircraft Systems.

The People

Louis N. Cattafesta is one of the most recent additions to the AeMES faculty and has become a central figure in the evolution of the dynamics and control program in the AeMES department. Prior to joining UF in April of 1999, he was a Senior Research Scientist at High Technology Corporation in Hampton, VA, where he founded and headed the Experimental and Instrumentation Group. He received a BS degree in Mechanical Engineering with Highest Distinction in 1986 from Penn State University, a MS degree in Aeronautics from MIT in 1988, and a Ph.D. degree in Mechanical Engineering in 1992 from Penn State University, after which he joined High Technology Corporation as a Research Scientist at NASA Langley Research Center. His research at NASA Langley focused on supersonic laminar flow control and pressure- and temperature-sensitive paint measurement techniques. His current research interests lie in active flow and noise control, particularly the modeling and design of piezoelectric actuators and the development and implementation of real-time, adaptive flow control schemes. He is a member of the AIAA Aerodynamic Measurement Technology Technical Committee and the AIAA Fluid Dynamics Sub-Committee on Flow Control. Figures (1) and (2) depict experimental fluid dynamics characterization of oscillations in a cavity.

Dr. L. Cattafesta

Norman Fitz-Coy is one of the most experienced members of the dynamics and control group in the AeMES department. He has worked on numerous research projects in widespread applications in multibody dynamics, control and mechanics. His research interests include the design of control strategies for systems with multiobjective criteria, dynamics and control of multiple-flexible-body dynamical systems, deployment dynamics for satellites and spacecraft and autonomous rendezvous and docking.

HIGHLIGHTS

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Millsaps-Taylor Memorial Lecture
by Prof. Ali Glezer,
Georgia Institute of Technology,
Spring 2002

UNIVERSITY OF FLORIDA

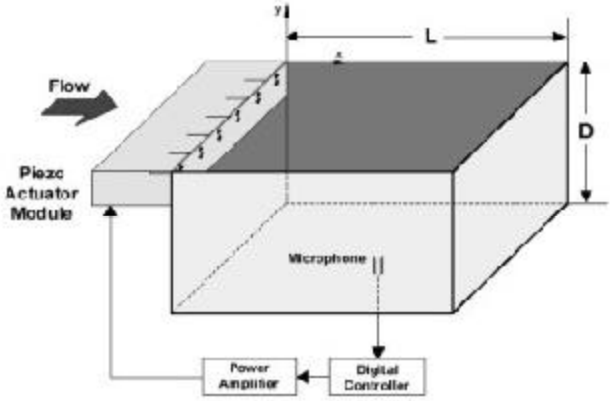
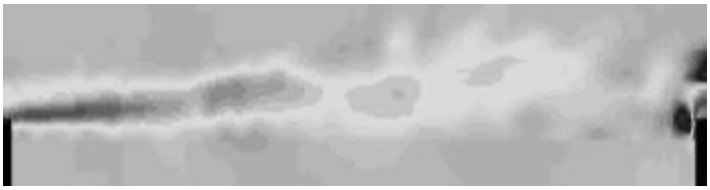


Figure (1) Schematic of experimental setup for the study of oscillations in cavity flow.



Density Gradient

Density

Figure (2) Mach 0.25 Phase-locked movie of 890 Hz cavity mode.

Dr. N. Fitz-coy

He earned his BS, MS and PhD from Auburn University in 1983, 1985, and 1990, respectively. Professor Fitz-Coy worked as a research engineer at the Logicon Control Dynamics Company until he joined the AeMES faculty as an assistant professor in 1990. Dr. Fitz-Coy became an associate professor in the AeMES department in 1996. Visiting Lecturer. Mechanical Engineering Depa rtment, University of Alabama in Huntsville, AL. He has worked in close collaboration with researchers at the US Army Missile Command at the Redstone Arsenal in Hunstville, Alabama. He has been awarded the 1992 Henry Pusey Best Paper Award at the 63rd Shock and Vibration Symposium. He is currently a member of the *American Institute of Aeronautics and Astronautics* and the *American Astronautical Society*. In addition to his diverse research activities, Dr. Fitz-Coy has been recognized as an exceptional educator at the University of Florida. He has been awarded the Bisplinghoff Teaching Award in 1993 and 1994. This award was presented by the University of Florida's AIAA Chapter for Outstanding Service to students in Aerospace Engineering.

Figure (3) Nonlinear multibody model of high mobility vehicle with weapon platform. Developed in conjunction with Dr. Mike Hale, Redstone Arsenal.

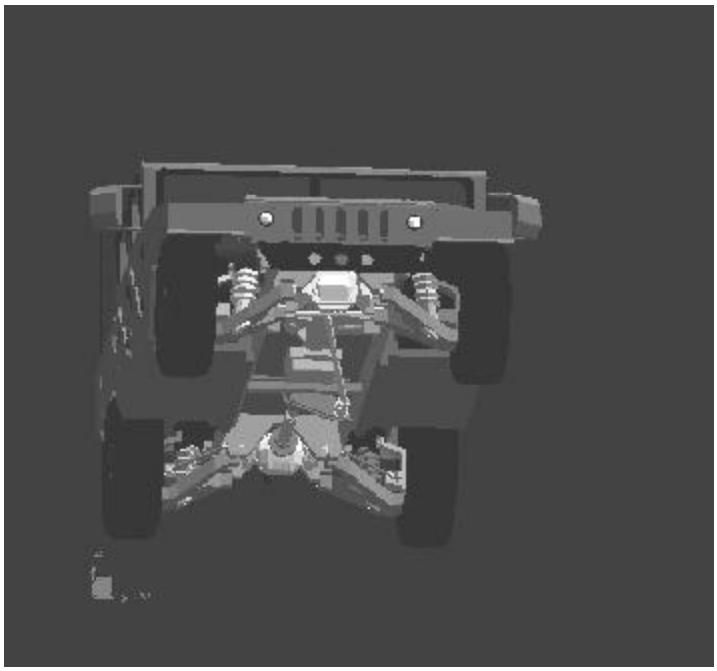


Figure (4) Detailed suspension of nonlinear multibody model of high mobility vehicle. Developed in conjunction with Dr. Mike Hale, Redstone Arsenal.

Benjamin Fregly is one of the newest addition to the dynamics and control group in the AeMES department and brings diverse experience in multibody dynamics and biomechanics to the department. Dr. Fregly earned his BS degree from Princeton University in 1986. He subsequently earned his MS and PhD from Stanford University in 1987 and 1993, respectively. Following his doctoral studies, Professor Fregly was awarded the Chateaubriand Postdoctoral Fellowship and attended the University of Lyon in 1994 as a postdoctoral student. From 1994 until 1999, when he joined the AeMES faculty, Dr. Fregly worked as a research and development engineer at the Parametric Technology Corporation. While employed at Parametric Technology Corporation, he was a project group leader within the Mechanica Division. This division specialized in the

development of engineering analysis software for the simulation of a variety of mechanics applications. His research within the biomechanics discipline has focused on knee mechanics, and specifically the simulation of the dynamics of the knee. The goals of his current research are two-fold. One goal is to study issues related to how and why people develop osteoarthritis of the knee joint. This is the joint that develops osteoarthritis most commonly. By developing careful models representing the dynamics of the knee, Professor Fregly seeks to simulate the effects of surgical decisions, such as the angle at which to cut a bone, to optimize surgical outcomes for arthritis treatments. In addition, he hopes to propose mechanical interventions to relieve pain and extend joint life in individuals with early-stage knee arthritis. The second goal of his research is to study issues related to wear and improved functionality of artificial knee joints. One of the tasks here is again to simulate the effects of surgical decisions, such as the positioning of the implant components relative to the bones, to provide a surgical planning tool. Moreover, it is desired to improve current artificial knee designs so that they will last longer and provide greater mobility than current designs.

Dr. B. J. Fregly

Figure (5) Video fluoroscopic image of knee joint used to measure in vivo bone motion.

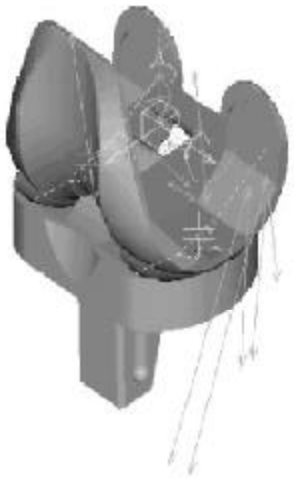


Figure (6) Nonlinear multibody dynamics model of contact and relative motion of the knee joint.

Andrew J. Kurdila provides diverse experience in the control and dynamics group in the AeMES faculty in control theory, nonlinear dynamics and computational mechanics. He attended the University of Cincinnati from September, 1978 until June of 1983, where he earned his Bachelor of Science in Applied Mechanics in the Department of Aerospace Engineering and Applied Mechanics. He subsequently entered the University of Texas at Austin in August of 1983, and he received his Master of Science Degree in Engineering Mechanics the following year. He earned his Master of Science Degree for research in experimental modal analysis and structural identification procedures for highly flexible systems. For his contributions in the field of structural identification during this time of study, he received a NASA Award of Recognition for creative development of a technical innovation in April, 1986. He subsequently worked as a research engineer at Structural Dynamics Research Corporation, in Milford, Ohio. After working as a research engineer in the Geometric Modeling Group at Structural Dynamics Research Corporation, he entered the Department of Engineering Science and Mechanics at the Georgia Institute of Technology as a Presidential Fellow. He earned his Ph.D. in January, 1989. He joined the faculty of the Aerospace Engineering Department at Texas A&M University on January 1, 1989 as an Assistant Professor, and was promoted to Associate Professor in September, 1993. He was awarded a joint appointment in the Department of Mathematics at Texas A&M University, and was recognized as a Select Faculty Fellow at Texas A&M University in 1995. While at Texas A&M University he was an active member of the Center for Mechanics and Control in the Department of Aerospace Engineering, the Center for Mechanics of Composites in the Department of Aerospace Engineering, and a member of the Center for Approximation Theory and the Institute for Scientific Computation in the Department of Mathematics. In July, 1996, he joined the faculty of the Department of Aerospace, Mechanics and Engineering Science at the University of Florida. His current research is in the areas of dynamical systems theory, control theory and computational mechanics.

Dr. A. Kurdila

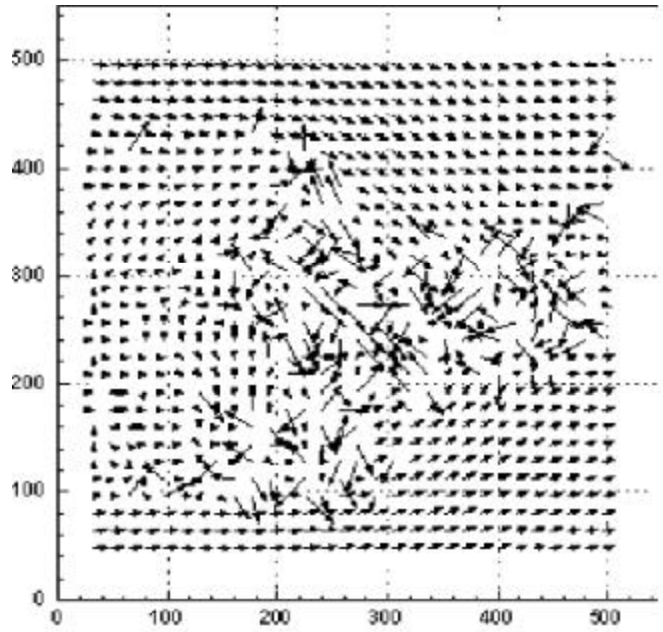


Figure (7) Velocity field of flow field over a wing section obtained via unfiltered particle image velocimetry.

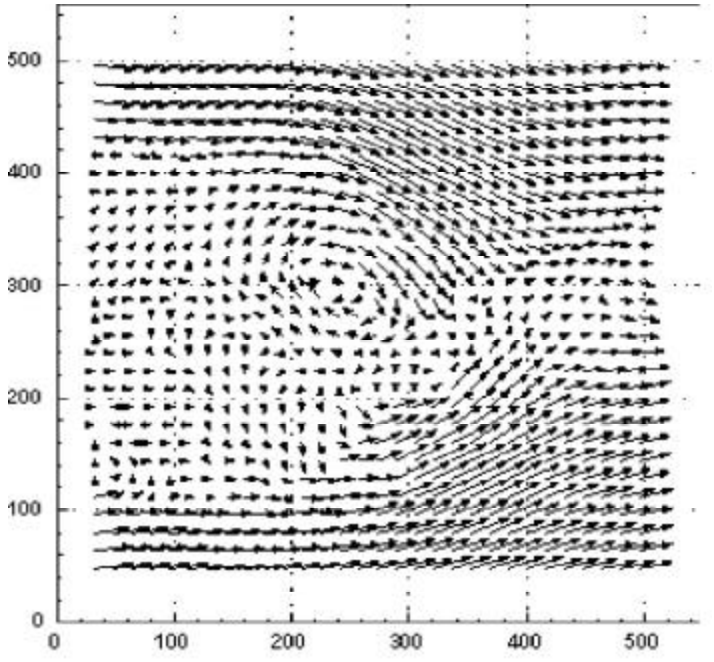


Figure (8) Velocity field of flow field over a wing section obtained via multilevel filtering enhanced particle image velocimetry.

Rick Lind has recently joined the group. Rick Lind is a new faculty member specializing in the area of dynamics and control. He received his Ph.D. from the University of Minnesota in 1995 for the study of robust stability and control. That research focused mainly on aircraft and flexible space structures.

He has spent the last 6 years working for NASA at the Dryden Flight Research Center. His research for NASA specialized on aeroservoelastic systems. These types of systems consider the standard rigid-body aircraft dynamics but also include the effects of flexibility in the structure, unsteady aerodynamics coupled with the structural motion, and feedback issues related to the control system. While at Dryden, he participated in flight test programs that included the F-18, F-15, SR-71, and several experimental aircraft. He received the Engineer of the Year award in 1998 and has twice been manager of projects that received Small-Group Project of the Year awards.

Dr. Rick Lind

Rick plans to continue his studies related to flight testing of experimental aircraft. This research will include methods of determining structural models and associated uncertainty descriptions, identifying nonlinear characteristics of systems, and predicting the onset of instabilities such as limit cycle oscillations. Also, he is continuing research into advanced control techniques for aircraft. This research includes robust control, automatic gain-scheduling control, and nonlinear control approaches.

The Passing of Two Greats in Mechanics

We are saddened to report that two of our emeritus faculty have died since our last issue: Daniel Drucker and Lawrence Malvern. In this issue we have published a piece by one of our own, Charles E. Taylor, in honor of Dan Drucker. We will do likewise for Lawrence Malvern in the Spring/Summer issue.

Memories of Dr. Daniel C. Drucker, 1918-2001

Graduate Research Professor Emeritus
University of Florida

Dr. Daniel C. Drucker, 83, died Sept. 1 of leukemia in Gainesville, FL Few people have served the engineering profession with such dedication and distinction as did Dan Drucker. He was known as a brilliant scientist, a leader in engineering education , and an eloquent spokesman for the engineering profession. Dan was a past president of the American Society of Mechanical Engineers (ASME), the American Society for Engineering Education (ASEE), the American Academy of Mechanics (AAM), the Society for Experimental Stress Analysis (SESA) - now the Society for Experimental Mechanics (SEM), the International Union of Theoretical and Applied Mechanics (IUTAM) - being only the second American ever to serve in that office, and other organizations. He was probably the most honored person in applied mechanics.

Dan was known throughout the world for contributions to the theory of plasticity and its application to analysis and design in metal structures. He introduced the concept of material stability, now known as “Drucker’s Stability Postulate”, which provided a unified approach for the derivation of stress-strain relations for plastic behavior of metals. His theorems led directly to limit design; a technique to predict the load carrying capacity of engineering structures. Dr. Drucker also made lasting contributions to the field of photoelasticity. His 1940 paper has become a classic and “Drucker’s Oblique Incidence Method” is widely used in university and industrial photoelastic laboratories.

Dr. D. Drucker

The ASME established the ASME Daniel C. Drucker Medal to honor Professor Drucker for his contributions to applied mechanics in research, education, and leadership. The new medal is bestowed on individuals in recognition of sustained, outstanding contributions to applied mechanics and mechanical engineering through research, teaching, and /or service to the community. Dr. Drucker was the first recipient of the medal which was presented at an 80th birthday luncheon honoring Dan during the Thirteenth U.S. National Congress of Applied Mechanics in Gainesville, FL, in June 1998. ASME also honored Dan with the Timoshenko Medal, the Thurston Lectureship, the ASME Medal, and Honorary Membership. For twelve years he was the editor of the Journal of Applied Mechanics.

The SESA/SEM conferred upon him Honorary Membership, the William M. Murray Lectureship, and the M.M. Frocht Award; American Society of Civil Engineers presented to him the von Karman Medal; the University of Liege gave him the Gustav Trasenter Medal ; Columbia University conferred upon him the Egleston Medal and the Illig Medal; from the Society of Engineering Sciences he received the first William Prager Medal ; the Founder Engineering Societies gave him the John Fritz Medal; he was the 1966 Marburg Lecturer for American Society for Testing and Materials; he was awarded the Prof. Modesto Panetti and Prof. Carlo Ferrari International Prize and Gold Medal . Dr. Drucker had honorary doctorates from Lehigh University, the Technion, Brown University, Northwestern University, and the University of Illinois at Urbana-Champaign. After Dan's death, his daughter Mady found among his mementos a "Medal for Getting the Most Medals" which someone had jokingly presented to him.

In 1988 Dr. Drucker received the National Medal of Science. He was a member of the National Academy of Engineering (NAE) and of the American Academy of Arts and Sciences, and was a Foreign Member of the Polish Academy of Sciences. He was listed in the national and international editions of Who's Who.

An articulate speaker who consistently gave stimulating and informative talks, Dr. Drucker was frequently invited to give keynote or other major addresses at engineering meetings. He had a reputation as an incisive thinker, and his advice was eagerly sought and generously given at the university, state and national level. A list of such participation is too long to be given here. but recent examples include: National Academy of Science Committee on Human Rights, National Research Council, Engineering Research Board, National Science Board, and the chairmanship of the NAE Committee on membership Policy.

Dan Drucker was born in New York City and started his engineering career as a student at Columbia University. His ambition at that time was to design bridges. While still an undergraduate at Columbia he met a young instructor named Raymond D. Mindlin (later a SESA Founding Member, President, and Honorary Member) who told Dan that "he *would* pursue a Ph.D. degree and he *would* write a thesis on photoelasticity". Dan complied, and received his doctorate in 1940. It was during his student days that Dan met a young lady named Ann Bodin. They *eloped* and were married in 1939.

He taught at Cornell University from 1940 to 1943 before joining the Armour Research Foundation . After serving in the U.S. Army Air Corps, he went back to the Illinois Institute of Technology for a short time before he went to Brown University in 1947. During his tenure at Brown he did much of his pioneering work on plasticity. Dr. Drucker joined the University of Illinois in 1968 as Dean of Engineering. During his more than 15 years there the UI College of

Engineering was consistently ranked among the best five in the nation. Although known for insistence upon technical excellence, his college was also recognized for its total commitment to equal opportunity for all. He left Illinois in 1984 to become a graduate research professor at the University of Florida, from which he retired in 1994.

Dan and the 20 year old girl with whom he eloped lived for more than sixty-one years as a very devoted and loving couple. They had a son, Dr. David Drucker now in Utica, NY, and a daughter, Mrs. Mady Drucker Upham now in Rockport, Mass.; and four grandchildren. My wife Nikki and I moved to Florida in 1981, but when the Druckers became our neighbors in Gainesville three years later, our social life increased by a factor of ten. Ann was a very generous person with a great sense of humor. She was interested in everything and we went to countless plays and musical performances together. Typically we would have dinner, attend the play, then end up at one our houses for desert. For the Taylors those years were our Camelot. In 1994 Ann suffered a severe stroke which confined her to a wheelchair. Dan stayed near always. Although he had traveled extensively all of his professional life, he never left Gainesville after her stroke. Ann Drucker died on December 30, 2000.

I met Dan during my first SESA meeting in 1949. At that time I had just started working toward a Ph.D. at the University of Illinois and intended to write a thesis on three-dimensional photoelasticity. Tom Dolan, who was my advisor, also attended that meeting and made sure that I met the important SESA members. When he saw Ray Mindlin and Dan Drucker standing across the room, he said to me, "Come over here, I want you to meet these two. They think things through pretty well before they speak, and are usually right". That was my introduction to Dan Drucker, and Tom was right. After that I started to see Dan regularly at meetings and he always greeted me with a big smile and a handshake. He had just written the chapter on three-dimensional photoelasticity in the *Handbook of Experimental Stress Analysis*, so I often talked with him about my proposed thesis. He was easy to talk with and always very helpful. In a sense he was a mentor for me even while he was still at Brown University. That happy relationship continued while we both worked through the various SESA offices, and while he was a very busy dean at the University of Illinois. He always made time to talk with me about technical subjects or engineering society business.

When Dan came to Florida he immediately joined our department's "lunch bunch" which met every school day at noon. At various times that included Knox Millsaps, Larry Malvern, Ray Bisplinghoff, Hans von Ohain, Chia-Shun (Gus) Yih, plus Dan Drucker and me. What a wonderful group of colleagues! I felt truly blessed, but now

all of these special friends have passed away and they are sorely missed. Up until the last month of his life, Dan and I still tried to have lunch three days a week. Those were happy occasions, even though we both realized that the inevitable was sneaking up on him. We didn't dwell on that and found lots of things to laugh about. In all of the thousands of hours we spent together, I never heard him utter a single swear word. He had a great sense of humor, but he never told a joke (off-color or otherwise), and he never spread gossip. If he ever had an unclean thought, he certainly didn't share it with me. I have never met a more honest or pure person. In other words, he was the kind of person that we all try to be. He succeeded where the rest of us fall far short.

Several people who knew how special Dan was to me, sent e-mail messages after Dan's death on September 1, 2001. Their words are much more eloquent than mine so I would like to include excerpts here. Philip Hodge wrote, "...I admired Dan, the scientist-engineer. But I also admired and liked Dan, the person. He was one of the most informed, the most fair, the most tactful, the most organized people I have ever known. I have watched him chair meetings of the ASME Council and of the IUTAM General Assembly - and it was a joy to see how he managed to make those highly autocratic bodies more democratic - and all without hurting anyone's feelings..."

Karl Pister wrote this to several colleagues, "... I know this [bad news] hits all of us hard. We have each had the privilege of knowing and working with Dan in some capacity. He was both a role model and a mentor for me, even at a distance, and he was invaluable as a member of my advisory committee while I was dean at Berkeley. What a splendid legacy he has left us, what an impact he had on so much - not just applied mechanics. We were fortunate to have known and worked with such a man. With sadness filled with respect, Karl".

Dick Christensen wrote, "...I feel about the same way that you must. He really was very special. I know for sure the succeeding generations in our field don't have any more like him.

I had been E-mailing with him and did so the last time 4 days before his death. At least I feel a little good about that. I'll write a note to Mady tomorrow".

Ben Freund said, "...I am deeply sorry to learn that we have lost one of the brightest stars our field has known in my time.

It happens that I have recently come back from this year's IUTAM Bureau meeting in Warsaw. While participating, I found myself thinking 'How would Dan handle this problem?' several times when sticky issues came up".

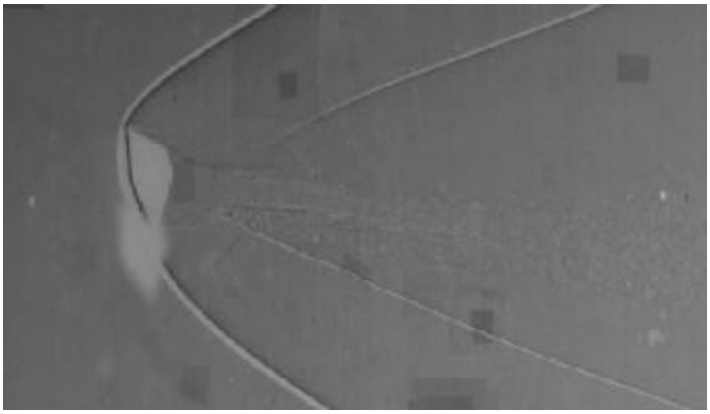
Mike Fourney added, "...I was fortunate to send [Dan] an email and to receive a reply before he passed. I assume you have received that info. Please let me know what is planned for a memorial or whatever. I don't know if I will be able to attend but would like to have the chance. He was certainly a great guy and I know that you will miss him, as will we all. If there is anything I can do please let me know".

Of course, the Drucker family received letters of condolence from all over the world. Mady was kind enough to give me a copy of most of those letters. The common thread that went through all of those letters was that Dan was highly respected as an engineering leader, but that he was tremendously admired as a person. Everyone mentioned that his kindness and help had influenced their careers and their lives. What an impact he made and what a legacy he left!

Mars Explorer Rover Mission Entry Capsule Tests at the GERC

The University of Florida's Graduate Engineering and Research Center (GERC) and the Air Force Research Laboratory Munitions Directorate at Eglin Air Force Base are partners in operating the Aeroballistic Research Facility (ARF) through a Cooperative Research and Development Agreement (CRADA), as reported in a previous issue of *The Streamline*. AEMES Professor and GERC Director Pasquale Sforza reports that NASA Langley Research Center (LaRC) recently requested test support for their Mars Explorer Rover Mission lander entry capsule. Free flight ballistic testing was needed to determine the entry capsule's flight aerodynamics at supersonic conditions. The testing was carried out in the ARF in order to obtain precise determination of complete aerodynamic force and moment coefficients. A total of 12 models were fired the complete length of the range (200m) at specific launch Mach numbers. Approximately 2 days were required to install the launcher within the ARF and prepare for the tests, 5 days to conduct the tests, and 1 day to remove all test equipment and collect/arrange all deliverable data. The ARF tests included time and position measurements from direct shadowgraphs taken at all 50 orthogonal stations. NASA LaRC provided the models and sabots while our subcontractor, Arrow Tech Associates Inc., carried out the data analysis and prepared the final report.

The University of Florida/AFRL team reviewed design drawings for the scale ballistic range model and sabot of three different configurations of the MER03 lander entry capsule. The designs and materials proposed were evaluated to assure their compatibility with the ARF prior to model/sabot fabrication. The properties (mass, center of gravity, moments of inertia) of each of the 14 models delivered were determined. Measurements of the attitude/time histories associated with Mach 4.0 to Mach 1.2 flight of 12 scale models of the MER03 lander were carried out in the ARF. Four shots were made for each of three different configurations. Photographic images of all data collected (e.g., direct shadowgraphs, projectile, etc.) in the tests were provided in electronic format. A sample of the shadowgraph results is shown in the accompanying photograph. The attitude/time data and mass properties data were provided, in electronic form, to NASA's Langley Research Center and Aerospace Computing Inc. performed independent data reduction. The ARF is currently scheduled to carry out testing in support of several advanced development projects for Boeing. Several research projects suitable for theses and dissertation work are now in the planning stages. Faculty and industry scientists interested in collaborations



Shadowgraph of the Mars Explorer Rover Mission lander entry capsule flying in the ARF

that can capitalize on the unique features of the ARF complex are encouraged to contact Professor Sforza. More details may be found at the GERC's ARF website located at www.gerc.eng.ufl.edu/ARF/intro.htm.

Congratulations to Our Graduate Students!

Leishan Chen, who is Ph.D. student advised by Peter Ifju and Bhavani Sankar, won first place in the Society for Experimental Mechanics Student Paper Competition held in Portland Oregon for his paper "Mode I Facture Testing of Stitched Composite Materials".

Leishan Chen

Ms. Nilay Papila has been awarded a Zonta International Amelia Earhart Fellowship for the 2001-2002 academic year.

Nilay Papila

Todd Schultz has been awarded a 2001 National Defense Science and Engineering Graduate Fellowship sponsored by the Army research office

Todd Schultz

Knox Millsaps Award for Excellence in Statics

Knox Millsaps, former Research Professor and Chairman of the Department, had quite a reputation with the engineering undergraduates at the University of Florida especially where the course Engineering Mechanics – Statics was involved. At least once the Independent Florida Alligator sponsored a "Statics Horror Story" contest around Halloween and the ad prominently featured a portrait of Knox. What would have surprised many of those students was that Knox would privately honor students that did exceptionally well by writing them personal letters and sending them cash awards. It was by accident that some of us, most notably former faculty member Joe Hammack, found out about this practice. He then would "pass the hat" at the end of each semester to fund a Millsaps Statics award for that term. Somehow Knox found out about this and told Joe "That is one of the nicest things anyone has ever done for me."

After Knox died on December 18, 1989 Richard Fearn worked diligently to establish the Millsaps Fund. One function of the Fund was to continue the awarding of the Knox Millsaps Award for Excellence in Statics and we have done so in the original manner and spirit started by Knox. The protocols for selection of recipients have evolved over the years, but the essential feature of making a private award has been maintained. By keeping the award a secret we know that we are rewarding students that strive for excellence for excellence's sake. These are the students that go well beyond just doing what is necessary to get an "A". If the award was public we felt that there would be students that would strive for excellence for the sake of an award and not be in keeping with the original spirit.

Keeping the secretive nature of the award is essential in maintaining its original purpose but that can also be its ultimate demise. As I sadly see some Knox's friends pass on I have come to realize that there could come a time when there will be no one around that knew the history of the award. I felt that now is the time as come to let a wider audience know about the history and traditions of the Knox Millsaps Award for Excellence in Statics. It is my hope that by doing so I will have made it possible for this tradition to live on.

Student Chapter News

AIAA

The UF student chapter of the American Institute of Aeronautics and Astronautics is off to a great start this year. On Veterans Day weekend they attended the Wings and Waves Airshow at Daytona Beach sponsored by Embry Riddle. In early 2002 they will participate in a tour of the Kennedy Space Center as well as a Space Shuttle launch. They have been preparing for the AIAA Regional Student Meeting held in Huntsville, Alabama in April. Currently, there are a number of students that have been working closely with faculty as research assistants that will present their research in the student paper competition. Additionally, the club sponsored an intramural flag football team. The 2002 Engineering Fair committee is working on a number of ideas for the event, including building scale models of planes to test in last year's wind tunnel. The E-Fair chairperson is Anna Kint, anagatr@yahoo.com. For general information about AIAA, contact Tom Singer at tomsing@ufl.edu, or visit the website, http://www.aero.ufl.edu/org/aiaa/.

BMES

The University of Florida's **Biomedical Engineering Society** kicked off its year at the BMES National Fall Conference at the Research Triangle Park in Durham, NC, October 4 – 7, 2001. Ten undergraduate students, and six graduate students represented the University of Florida.

The UF chapter of BMES is anticipating an exciting year of activities including the 57th Annual Engineering and Science Fair held February 11th – 13th in the O'Connell Center. BMES is also going to sponsor its Fourth Annual Biomedical Engineering Design Competition in early April. Last year's competition featured research projects from students at the University of Florida, Duke University, and the University of Pittsburgh. The entries for the national design competition are expected to be increasingly popular due to the heightened interest in undergraduate biomedical programs at schools throughout the United States.

The UF BMES holds monthly meetings, which feature keynote speakers from both academia and industry. For more information on the BMES at UF, please visit us at: http://aemes.aero.ufl.edu/org/ufbmes/.

Alumni Corner

Wei: It's good to hear from you too. Thanks for forwarding the information about our position. It seems that it is very hard to find a suitable person with aero. and controls background.

I am very happy and proud to have made the promotion to full professor. Things are going very well for me at UCF. I have many interesting research projects under way and many good prospects looming on the horizon. By the way, we finally got the conjugate work funded. We had 1 year funding from NASA Glenn under an NRA and just got word we received 3 year NRA grant...persistence pays off.

I will be happy to cooperate regarding student recruiting. It is getting increasingly harder to get good students. We are building links to Europe, South America etc...to recruit students to grad. school. This business is getting tougher by the day. So of course, it is best to work together. Maybe we can try to get collaborative projects ongoing between our departments. This will enhance our chances to recruit students successfully.

On the personal side, my wife and I are first-time parents and now have a cute little girl in our lives. Danielle is now one year old and she's a lot of fun.

Please convey my best to my friends at AEMES.

Best regards,

Alain

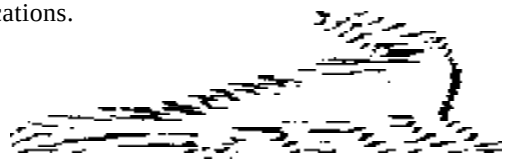
2002 Millsapps-Taylor Lecture

Dr. Ali Glezer

In Spring 2002, the Taylor-Millsaps lecturer will be **Dr. Ali Glezer**, Professor and George W. Woodruff chair in thermal systems, Georgia Institute of Technology.

Professor Glezer's research interests focus on the manipulation and control of shear flows in a broad range of applications, including reacting and nonreacting mixing processes, enhancement of the aerodynamic performance of airborne and underwater vehicles, small-scale combustion-driven power systems, jet thrust vectoring and noise reduction, fluidic-driven heat transfer with an emphasis on electronic cooling, fluid atomization, and the development of novel fluidic actuator technologies including micro electro mechanical systems based (MEMS) actuators.

His current research projects include the development of a centimeter-scale reciprocating pulse-bombustion-driven MEMS-based microgenerator to replace batteries in portable electronic hardware; the demonstration of robust micromachined jet actuators technology and its application in unmanned airborne vehicles or micro-unmanned airborne vehicle platforms; aerodynamic modification of lifting surfaces of a class of unmanned airborne vehicles; the direct, small-scale control of fuel-air mixing in a "smart" high-performance turbine; thermal management in electronic packaging using fluidic forced convection heat transfer; optical phase correction in free shear flows using neural networks, optoelectronic image processing, and global optical flow diagnostics; heat transfer enhancement in a thermally-driven boundary layer along a heated surface; fluid mechanics of the through-hole plating of printed circuit boards; and vibration-induced fluid atomization for two-phase cooling and coating applications.



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