

Workshop Participants

Undergraduate Participants

Harold Afanador-Hernandez, UPR-Mayaguez
Curt Boirum, Bradley University (IL)
Andrew Bradford, University of Washington
Angela Burgett, University of Nebraska—Omaha
Jonathan Conley, University of Arkansas-Fayetteville
Oghene Egborge, Central CT State University
Brett Jasmin, Burlington Aviation Technical College (NH)
Thomas Klekotka, Holyoke Community College (MA)
Caleigh MacPherson, University of New Hampshire
Brian McCarthy, Holyoke Community College (MA)
Sara McMurray, Holyoke Community College (MA)
Brandt Pedrow, University of Idaho
Colin Pespisa, University of Massachusetts-Amherst
Colby Ranslem, University of Nebraska-Omaha
Paul Rinaldi, Central CT State University
Thomas Sebastian, University of Massachusetts-Amherst
William Stommel, University of Wisconsin-Stout
Lavelle Summerville, Fairfield University (CT)
Matthew Yandow, Burlington Technical Center (NH)
Veraj Zaveri, Illinois Institute of Technology

Ph.D. Candidate Participants

Daniel Bersak, Yale University
Kerri Phillips, West Virginia University
Marius Ghita, Portland State University (WA)

High School Participants

Amanda Gates, East Haddam High School
Katheryne Guillette, University High School
Tanvir Reza, University High School

Professional Guests

Dr. Nejat Olgac, University of Connecticut
Mr. Igor Parsadanov, University of Connecticut
Rich Way, Project Engineer, Fuel Cell Energy
Keith Davis, Project Engineer, Fuel Cell Energy
Ross Bonacci, Manufacturing Engineer, Fuel Cell Energy

Student Instructors

Luke Ionno

Luke Ionno is a graduate of the mechanical engineering program at Central Connecticut State University. He has received two Space Grant Consortium fellowship grants for unmanned aerial vehicle research, as well as Space Grant funding for an industrial internship at Kaman Aerospace. Luke has extensive experience in the design, fabrication and flight-testing of fully-autonomous unmanned aerial vehicles.

Previous projects include fielding modular, fixed-wing platforms that can fly for over an hour, while carrying both live video and still cameras, development of a unique rifle-launched reconnaissance UAV, capable of vertical deployment from within urban environments, as well as a camera payload for the Up Aerospace's Space Loft SL-3 suborbital rocket, launched in May, 2009. Currently, Luke is enrolled in the graduate program at the University of Hartford, where he is working on the development of an Army-funded UAV.

Student Instructors

Luke Ionno, University of Hartford
John Kentfield, Central CT State University
Tim Maver, University of Hartford
Paul Rinaldi, Central CT State University
Mike Whitty, Central CT State University

Teaching Assistants:

Dennis Akin, Central CT State University
Adam Clark, University of Hartford

FOR MORE INFORMATION:

CT Space Grant Consortium
University of Hartford
200 Bloomfield Avenue
West Hartford, CT 06117
<http://uhaweb.hartford.edu/ctspgrant/>
www.cthelixp.com

The **NASA Connecticut Space Grant Consortium**, a NASA supported Space Grant Consortium, consists of Bridgeport University, Central Connecticut State University, Connecticut Colleges of Technology, Eastern Connecticut State University, Fairfield University, Southern Connecticut State University, Trinity College, the Universities of Connecticut, Connecticut Health Center, Hartford, and New Haven, Wesleyan University and Yale University. The purpose of the CT Space Grant Consortium is to encourage research and education in Space/Aerospace Science and Engineering.



Helicopter Workshop

August 1—6, 2010



Spin on It!

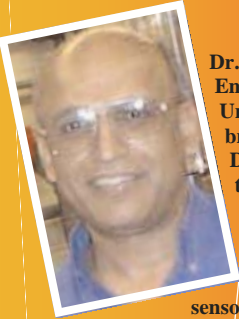
Workshop Highlights

Al Gates



Alfred A. Gates has worked as an aerodynamic consultant to KAMAN Aerospace performing wind tunnel testing on the SH-2G Sea Sprite helicopter and the KMAX servo flap and variations to determine the aerodynamic loading and flow fields. He also built an auto rotation wind tunnel used to test the characteristics of the SH-2G helicopter jettisoning external payloads during auto rotation. While employed at the Naval Under Sea Warfare Center (NUWC), Dr. Gates performed CFD analysis on the Sea Wolf fast attack submarine and Wide Aperture Arrays to optimize pressure and flow fields. At NUWC he developed an automatic three dimensional shape optimization program that utilized supercomputers to perform the numerous computations. Dr. Gates also served at General Dynamic Electric Boat where he was responsible for the main steam piping system from the reactor bulk head to the ship systems turbine and the propulsion units. Dr. Gates is a pilot and was a safety office in a military flying club where he was responsible for 4 aircraft, one of which was a Navy T34B trainer. Dr. Gates has extensive experience flying gas powered model aircraft. Currently Dr. Gates is the chair of the department of engineering at Central Connecticut State University and is involved with UAV research and development. Dr. Gates, Luke Ianno and Matt Lombardo have developed two payloads that were launched at Space Port America in New Mexico in the Space Loft rockets, SL-1 and SL-3, operated by UP-Aerospace, www.upaerospace.us.com. In addition to his academic work Dr. Gates is a mechanical engineering consultant in the area of high temperature fuel cells, MCFC and SOFC, for FuelCell Energy. On the weekends during the winter Dr. Gates is an alpine race coach at OKEMO Mountain Vermont.

Nidal Al-Masoud



Dr. Al-Masoud is an Associate Professor of Engineering at Central Connecticut State University. His research interests are broadly in the area of Control Systems and Dynamics and work is focused on the Active Control of Combustion Thermo-acoustic Instabilities; part of which was done under a scholarship from NASA. He was involved with numerous issues related to optimization of actuator/sensor for the combustion system, design of parametrically excited controller and design of robust controllers based on a minimax problem formulation. Currently, he is leading the efforts of enhancing and upgrading the experimental facilities in the fields of Fluid Mechanics, Heat Transfer and Strength of Materials. Dr. Al-Masoud is a member of ASME (American Society of Mechanical Engineers), and the faculty advisor of the first CCSU Student Chapter. He served as a reviewer of several conferences and journals.

Peter Baumann



Dr. Baumann is an Associate Professor of Engineering at Central Connecticut State University. He has over 20 years industrial engineering experience, specializing in the selection and application of metals and alloys, polymers, ceramics, and composites. He has held several positions of increasing responsibility within industry. Dr. Baumann is a member of several technical committees of the American Society for Testing and Materials (ASTM) and currently holds the position of Honorary Chairman on the Light Metals and Alloys Committee, B07, within this organization. His current research interests include: Mechanics of materials, contemporary and advanced engineering materials, modeling of mechanical and physical properties, and designed experimentation.

Spin on It! Helicopter Training Workshop

This week you will: ♦Learn why helicopters behave as they do during flight operations. ♦Construct and flight test (wind tunnel and outdoor) radio controlled coaxial helicopters, and compete in an obstacle course using the coaxial helicopters and VTOL aircraft that you build. ♦Use two human powered helicopter test fixtures for experimentation, to learn about maximizing lift over drag. ♦Network with aerospace leaders, present your wind tunnel test results to aerospace professionals, tour Sikorsky and KAMAN manufacturing and engineering facilities, and ♦Experience a 1-hour ride in a Robertson 4-place helicopter (up to 3,000 ft. and 140 mph) during this unique training experience.

Sunday, August 1

Registration and Welcome/Orientation

1:00-5:00 Registration, Room NC134

1:00-5:00 Concurrent Ice-Breaking Activities

- RC Aircraft and Helicopter flight simulation, Room NC134
- CX2 RC helicopter flight instruction, CCSU Athletic Fields
- RC Wing Flight Instruction, CCSU Athletic Fields

4:00 Welcome and Orientation, Room NC 134

5:00 Dorm Check In, Vance Hall

6:00 Dinner, Memorial Hall

Monday, August 2 and Tuesday, August 3

Helicopter Flight, DOE, Aerodynamics, VTOL Building & Low Speed Rotor Blade Aerodynamics, and Wind Tunnel Operations & Aerodynamics

7:30-8:00 Breakfast, Memorial Hall

8:00-12:00 Concurrent Workshop Courses

- 8-10 Principles of Helicopter Flight, NC150
- 8-10 Wind Tunnel Operations & Aerodynamics, NC134
- 10-12 Design of Experiments (DOE), NC124
- 10-12 Control Theory (Tuesday only), NC133
- 10-12 Principles of Helicopter Flight, NC150

12:00 Boxed Lunch

12:00-6:00 Concurrent Break Out Sessions

- Vertical Take-Off & Landing (VTOL) Aircraft Building, Ballard
- Quad & Dual Rotor Blade Test Fixture Experimentation, Bubble
- 3:00-5:00 UAV Demonstration Flights, Recreational Field

Dinner

- Monday @ 6:30pm—Memorial Hall, CT Room
- Tuesday @ 6:00p.m.—Memorial Hall

Wednesday, August 4

Wind Tunnel Test, Helicopter Aerodynamics, Kaman Tour

7:30 – 7:45 Breakfast, Memorial Hall

Concurrent Workshop Courses (University of Hartford)

- 8:30 – 5:00 Wind Tunnel Testing, Wind Tunnel
- 8:30 – 10:30 Helicopter Aerodynamics, Dana 129
- 10:45-12:00 Helicopter Experimentation, Dana 129
- 10:30 – 12:00 Evaluation of Experimental Data, Computer Lab

12:00 – 12:30 Boxed Lunch

1:15 – 3:15 Kaman Aerospace Tour

4:00-6:00 VTOL Aircraft Flying and Building, Ballard

6:00 – 6:45 Dinner, Memorial Hall

Thursday, August 5

Sikorsky Tour, UAV Instruction and Demo

8:00-8:30 Breakfast, Memorial Hall

8:30—10:15 VTOL Aircraft Building, Ballard

8:30 – 9:30 UAV Design and Analysis, NC134

9:30 – 10:15 UAV Electronics and Programming, NC134

10:30 – 12:30 Travel to Sikorsky Aerospace/ Lunch

12:30 – 2:30 Sikorsky Aerospace Tour

4:00 – 6:15 VTOL Flight Competition, Recreational Field
(Best VTOL AC and Best Crash)

6:30– 8:00 Awards Banquet, Memorial Hall, CT Room

Friday, August 6

Wrap Up

7:30-8:30 Dorm Check-Out, Vance Hall

8:00 – 9:00 Breakfast, Memorial Hall

Program Closing & Evaluation, NC134

- 9:00 – 10:00 Program Closing Remarks & Evaluation
- 10:00 – 11:00 Workshop Participant Presentations
- 11:00 – 12:00 Aerospace Career Discussion

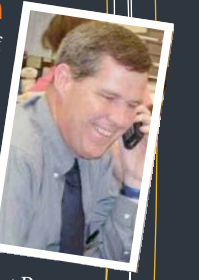
12:00 Departure (Boxed Lunch Provided)

John Wei



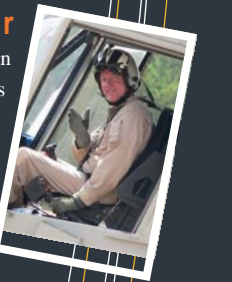
FUSHANG (JOHN) WEI has been teaching at CCSU's Department of Engineering since January 2010. Prior to his retirement in December 2009 from Kaman Aerospace Corporation, Dr. Wei was the Chief Engineer of Aeromechanics and an adjunct faculty of the Mechanical Engineering Department at the University of Hartford. He received his Ph.D. in Mechanical Engineering from Washington University, St. Louis, Missouri in 1978. He worked at Kaman Aerospace Corporation for 30 years. At Kaman, he was responsible for research projects involving advanced rotor dynamics, rotor performance, structural dynamics, wind tunnel tests, and helicopter flight tests. He has gained substantial experience in designing, analyzing and testing servo-flap main rotor systems. From 1988 to 1993, he was a Group Leader in the Test and Development Department responsible for new rotor system shake, whirl, and flight tests. From 1994 to 1999, he worked for Mr. Kaman – founder of Kaman Aerospace Corporation as his technical consultant. He has taught at the University of Hartford for 12 years and has been an advisor to M.S. thesis graduate students. He was an active member of American Helicopter Society Dynamic Committee. He has published over 60 technical papers in the AHS and AIAA Annual Forums, Specialists' meetings and served a 3-year term (2007-2009) as an Associate Editor of the AIAA Journal.

Thomas Filburn



Tom Filburn obtained his Ph.D. from the University of Connecticut in Chemical Engineering, he also holds a B.Sc. and M.S. in Mechanical Engineering from the University of Connecticut, Storrs CT. He has worked for Northeast Utilities, United Nuclear Corporation and United Technologies Corporation (UTC). Prior to joining the faculty at the University of Hartford he performed research for a liquid metal combustion system used for torpedo propulsion at the Applied Research Lab at Penn State University. His last assignment before joining the University was with the Space, Land and Sea group at Hamilton Sundstrand (UTC division), where he performed research on regenerative life support technologies for NASA. His research interests lie in the area of energy, sustainable design, greenhouse gas control and environmental design. He has published in Industrial and Engineering Chemical Research, the Fuels Journal of the American Chemical Society and has presented at many conferences. He holds 6 US patents for chemicals and methods to condition enclosed habitats.

Frank Gallagher



Frank Gallagher is currently the Chief Test Pilot, Kaman Aerospace Corporation, located in Bloomfield, CT. In this capacity he is responsible for the flight test activities of the naval SH-2G twin engine Seasprite helicopter and the K-1200 KMAX Aerial Truck, a specialized helicopter designed for the logging, construction, and firefighting industry. Frank has had a life time of helicopter flying and helicopter test flying. Previously, he was the Vice President of Operations at Enstrom Helicopter, a manufacturer of three lines of small helicopters. He also served as an experimental engineering test pilot at Sikorsky Aircraft, where he had the opportunity to test fly three "X" helicopters and was involved in the development of the CH-53E, S-76, and UH-60A Blackhawk. Additionally, he was Director of the Florida Institute of Technology Flight Training Department and served three years there as an assistant professor in the College of Aeronautics. <http://www.kamanaero.com/helicopters/kmax>.