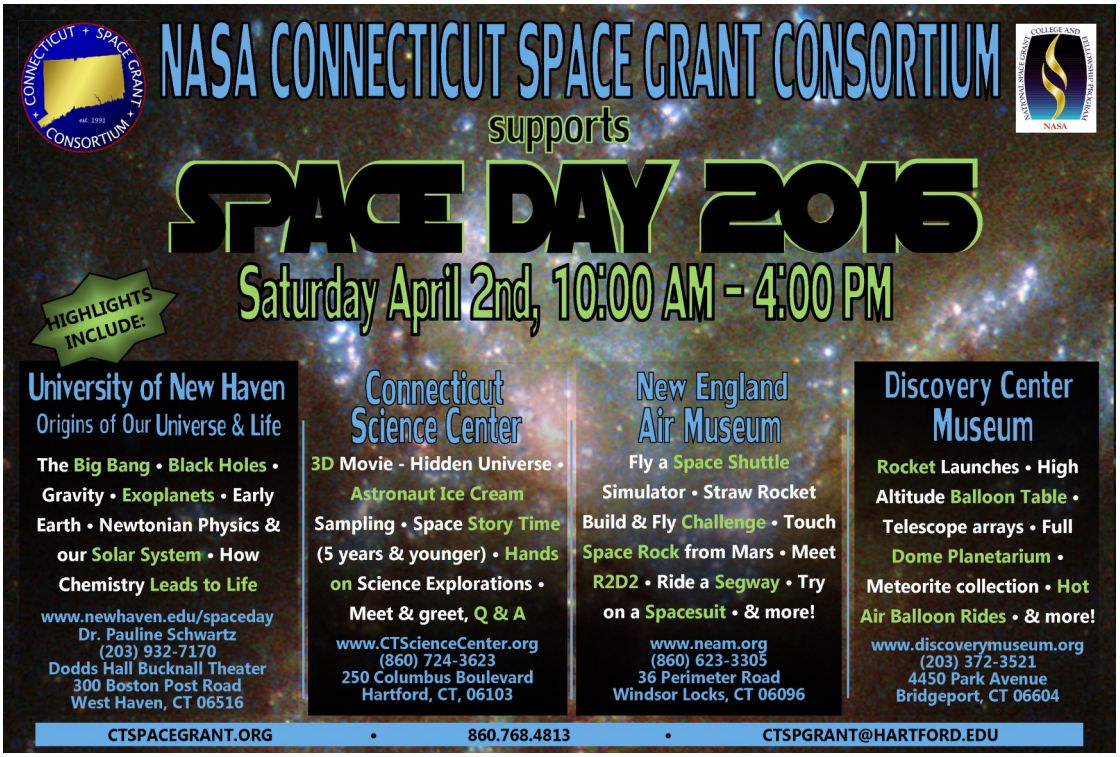
NASA Connecticut Space Grant Consortium NEWSLETTER

VOL. VIII FALL 2015



Inside the Issue:

NASA SPACE DAY in the State of Connecticut

Governor Dannel P. Malloy has proclaimed that **April 2nd, 2016** will officially be NASA Space Day in the State of Connecticut.♦

Last year's SPACE DAY at the Connecticut Science Center

On Sunday, March 29, 2015, Connecticut Science Center visitors enjoyed a day of super spacey fun! They were there to celebrate Space Day with tons of space-themed activities. They also explored the Science Center's hands-on exhibits, including those in the Exploring Space Gallery; guests prepared for an excursion in the Lunar Lander, created virtual moon dust footprints, and journeyed to a black hole in the Galaxy Explorer pods. Guests also tasted astronaut ice cream and saw a NASA space suit up close, as well as participated in Live Gallery Science demonstrations about our Solar System. They took space-tastic photos and met the Storm Troopers of the 501st Connecticut Garrison. Also present at Space Day were scouts from around the state who participated in a special scouts-only scavenger hunt to earn an out-of-this-world Science Center patch. The day was such a success that the Science Center plans to host another NASA Space Day on April 2, 2016! A special thanks to the Connecticut Space Grant College Consortium for supporting this event. ♦

Other participating organizations for Space Day 2015 were the Discovery Museum and Planetarium, New England Air Museum, and the Doolittle School located in Cheshire, CT. Please view our website for more on CT Space Day!

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FACULTY SPOTLIGHT:

Ryan Munden, Ph.D.

In the heat of the 2015 summer, while others played at the beach, 25 young students were STEAMing away in Greater Bridgeport! Thanks to a grant from the CT Space Grant College Consortium, Fairfield University was able to partner with ACCESS Educational Services, a 503c non-profit dedicated to Science, Technology, Engineering, Art, and Math (STEAM) enrichment for underrepresented students in the Bridgeport and New Haven areas to offer the Summer STEAM Camp. Thanks to the CT Space Grant, four bright young science and engineering college students, themselves from diverse backgrounds, served as counselors and mentors to the 25 students, from 5th – 8th grade that came to learn about all kinds of STEAMy topics.

Fairfield University / ACCESS Education Summer STEAM Camp for Bridgeport Area students

The kids learned about robotics, honed their math skills, checked out what happens when things get nano small using a scanning electron microscope, and were able to tour two University engineering campuses. They also learned about CAD and 3D Printing and did some Amazing Art & Engineering Projects. They also spent a day learning about Space Science using a NASA Curriculum. Above all else, they had tons of fun! Dr. Munden reported "The looks on their faces as they participated in these activities was proof that they were really seeing themselves as doing science and engineering. One young girl grinned ear to ear as she prepared to grind up an effervescent tablet to test reaction times, and exclaimed "We get to do this ourselves? Wow! I've never done this before!" We couldn't have hoped for a better reaction to prove that we were reaching these kids at an extremely important, formative time of their lives."

The CT Space Grant was the key to making this camp possible this past summer. CT Space Grant funding provided the stipends for the college student counselors that ran all of the activities and supervised the children each day, it also provided the funding for supplies and buses to sites. However, many other partners pitched in to offer help, services and direction. Housatonic Community College made space available to hold the camp in the heart of the City. The City of Bridgeport Nutrition Center provided breakfasts and lunches for all of the students each day. Fairfield University and UCONN Health Center hosted the students for days on campus learning about careers in engineering and health sciences, as well as doing hands-on lab activities. Over a dozen other individuals donated their time and expertise to present on different topics to the students or lead them through activities.

All of these parts came together for what was an extremely successful STEAM camp experience. All kids are budding scientists. In their earliest years they explore everything and ask questions to learn about the world around them. Unfortunately many kids lose their passion for science in the middle school years. This camp will serve to keep that spark alive and inspire these kids to prepare themselves now for careers in STEM fields. ♦

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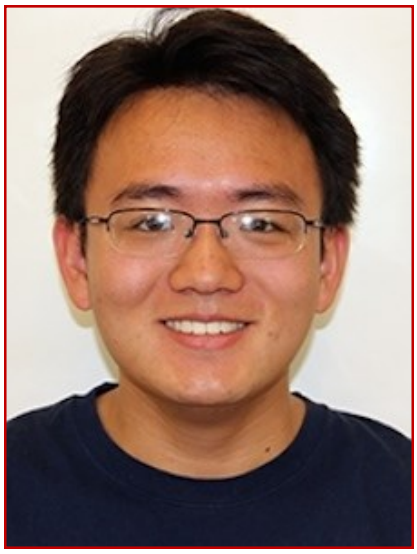
STUDENT SPOTLIGHT:

Warren Zhang

Between September 2014 and May 2015, [my team members and I] set out to design, build, and fly a scratch-built two-stage rocket. In the fall semester, our team (composing primarily of novices with no rocketry experience whatsoever) studied rocket design principles, learned to use the modeling software OpenRocket, practiced fabrication techniques, and eventually built the *Archimedes*, a 112 in. tall rocket with a 5.5 in. diameter. We tested systems for collecting in-flight accelerometer and gyroscope data, capturing video footage, and igniting a second-stage motor. In November, we successfully launched the rocket to 2400 feet, but due to the severe cold (sub-freezing temperatures), the lithium-ion batteries powering our data collection systems failed and nothing was captured.

In the spring semester, we constructed the *Archimedes II*, a 124 in. tall, 5.5 in. diameter rocket. This rocket featured several improvements over our prototype, including a completely redesigned electronics bay that used 3D printed racks to fit more equipment in a small space. We also improved the structural integrity of the rocket airframe by applying two layers of carbon fiber and epoxy composite to the surface. We were able to use the carbon fiber due to independent research and development of application techniques with minimal cost and complexity. In May, we successfully launched the rocket to 9617 feet and managed to capture video footage using a Raspberry Pi and Raspberry Pi camera. However, an electrical failure prevented any accelerometer or gyroscope data from being collected.



Ultimately, the project succeeded in its primary objective: to design and fly a multistage rocket. Both the prototype and final rocket designs were launched and recovered successfully, with minimal damage, and the rocket design and fabrication techniques we developed will improve sounding rocket development at the collegiate level. ♦

Multistate Rocket Research Project

Rocket positioned on the rail.

Left to Right: *Andrew Arkebauer, Antonio Maldonado, Maximilian Baranov, Warren Zhang, Peter Nguyen, Brian Beitler*

Rocket taking off.

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Space Grant Award Recipients (Fall 2015)

Faculty Research Grants
Dr. Graves Scott (SCSU)
Dr. Baikun Li (UCONN)
Dr. Julian Norato (UCONN)
Dr. Sharma Nimmi (CCSU)
Dr. Fu-Shang Wei (CCSU)

Faculty STEM Education Research and Programming Grants
Dr. Mary C. Arico (UHart)
Dr. Michele Dischino (CCSU)
Dr. Alison Draper (Trinity College)
Dr. Amrys Williams (Wesleyan)

Faculty Travel Grant
Dr. Wook-Sung Yoo (Fairfield)

Graduate Research Fellowship
Alan Shen (UCONN)

Undergraduate Travel Grants
Jalal-ud-din Butt (CCSU)
Melissa Lowe (Wesleyan University)
Dominic Miceli (CCSU)
Jesse Tarnas (Wesleyan)

Undergraduate Research Fellowships
Rachel Aronow (Wesleyan)
Caitlin Hansen (SCSU)
Fiona O'Donnell (UCONN)
Tristan Peirce (Trinity College)
Jeffrey Panko (New Haven)
Dana Wensberg (Trinity)

Undergraduate Directed Campus Scholarships
Benjamin Bartolome (Yale)
Phillip Carroll (Bridgeport)
Daniel Cataldo (UCONN)
Aylin Garcia Soto (Wesleyan)
Joshua Hauge (Bridgeport)
Jessica Johnson (CCSU)
Paul Klaucke (SCSU)
Anthony Mastromarino (UNH)
Jacob Mevorach (Trinity)
Daniel Pappalardo (Hartford)

Undergraduate Directed Campus Scholarships (continue)
Garret Sullican (SCSU)
Luis Mauricio Uyaguari (Trinity)

Community College Scholarships
Itania Lamarre (NVCC)
Jonathan Stanford (NVCC)

Student Project Grants
Andrew Arkebauer (Yale)
Brian Beitler (Yale)
Jalal-ud-din Butt (CCSU)
Leonard Cannon (CCSU)
Sandra Diaz (CCSU)
Noel Laflamme (Fairfield)
Betsy Li (Yale)
Dominic Miceli (CCSU)
Scott Smith (Yale)
Kelly Woods (SCSU)
Ian Wooley (Yale)

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Eastern Connecticut State University
Fairfield University
Gateway Community College
Housatonic Community College
Manchester Community College
Middlesex Community College
Naugatuck Valley Community College
Northwestern Connecticut CC
Quinebaug Valley Community CC
Southern Connecticut State University
Three Rivers CC
Trinity College
Tunxis Community College
University of Bridgeport
University of Connecticut
UCONN Health Center
University of Hartford
University of New Haven
Wesleyan University
Yale University

Non-Academic Affiliates

Connecticut Invention Convention
Connecticut Science Center
Discovery Museum
New England Air Museum (NEAM)

Industrial Affiliates

Pratt & Whitney Aircraft
UTC Aerospace Systems
UTC Research
Dymotek
Doncasters
Pioneer Aerospace
Proton OnSite

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