

Clear skies above and below

Collin student takes to the sky

By Heather Darrow

When Allen resident Steven Maggard was in second grade, he read *The Hobbit*. Like Bilbo Baggins, he unwittingly waited for his adventures to begin. As a young boy, he spent hours reading and crafting hordes of paper airplanes in an effort to discover a better design that would keep his creations in the air longer. Ah, but let's skip ahead to where the story really takes flight—the day he approached his Collin College physics professor, Dr. Mike Broyles, about an experiment involving an aircraft.

Fast forward a smidge in time and you find Maggard strapped into an airplane seat, wearing a force vest to measure acceleration and altitude. At 2,000 feet in the air, he is the human element in an experiment

that could provide the answers he was seeking so many years ago. Suddenly, the engine stops humming and the plane plummets. Eyes wide open, Maggard watches as Four Winds Aviation pilot Russell Husbands pulls the plane out of a forced stall.

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“We fell a few feet. My heart was racing. The pilot pulled a lever, which changes the angle of the aileron, a hinged flap on the wing. He slowed

down to stall speed of around 49 knots and then we fell. He pushed on the yoke and slowed the angle by readjusting the aileron and we leveled out and flew smoothly again. On a rollercoaster, you are on a track. On an aircraft, you know if you don't catch yourself you are doomed,” Maggard said.

President of the Collin Math Club, Maggard is a student in Collin College's Center for the Advanced Studies in Mathematics and Natural Sciences (CASMNS). Students often work one-on-one with professors in this unique undergraduate research program and projects range from gene sequencing to asteroid discovery.

Dr. Broyles was enthralled with Maggard's idea on flight research.

Broyles' father was a World War II Navy pilot. Following in his father's footsteps, the college physics professor acquired a license to fly gliders, served as a commercial flight instructor for gliders and sailplanes and also flew power planes.

"A lot of people fly but don't have an understanding of the physics behind the flight. We wanted to explore the theory. Steven came to my office and we discussed Bernoulli's principle, how lift is generated and how airplanes fly. We also went over centripetal force when you do turns. I suggested he wear a force vest to measure acceleration and altitude. The instrument measurements on the plane are not always the true air speed because air can be moving relative to the ground," Dr. Broyles said.

Dr. Broyles also suggested that Maggard learn the aircraft's flight characteristics and measurements and compare the mathematical data to his flight. According to Dr. Broyles, CASMNS projects are fairly open ended, and he encourages students to generate ideas that will extend their knowledge in the careers they plan to pursue.

"One of my goals is to become an aviator in the Marine Corps. Now, I understand the physics of flight and how the plane moves through the air," Maggard said.

Maggard recently earned an associate degree from Collin College, summa cum laude, and plans to transfer to an area university to earn a bachelor's degree in physics.

"You can complete research, but unless you see how it applies you miss a lot. It becomes true, not just something you read about. There's nothing quite like Collin College. I was able to get to know students and my professors. I've never had an experience like that before. In a way, Collin feels like home," Maggard said.

Maggard and Dr. Broyles do not view flying the same way most people do. They truly understand the mechanics of the experience. Formulas and principles are emblazoned like

watermarks in their minds, the foundation behind every take off, turn and landing.

"Air is a fluid like water, not as thick as water, but the physics principles that apply to a fluid still apply to air. In a glider you can hear the air. Gliding—the word is like the experience," Dr. Broyles said.

"Being able to soar above the ground was surreal. I could see clear sky above and below accompanied by the hum of the engine as we went along. It was amazing," Maggard said, his eyes twinkling with excitement.

The truth is this Allen resident's adventures have only just begun.

For more information about undergraduate research at Collin College, visit www.collin.edu/academics/casmns/. ❖

Heather Darrow is a public information writer for Collin College.

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