

## VILLANOVA ENGINEERS SHOOT FOR THE STARS

Villanova's College of Engineering has a long and storied history with the aerospace industry, and the National Aeronautics and Space Administration (NASA), in particular.

### First Strides

NASA was only a few years old when Villanova Mechanical Engineering graduate **James "Jim" Correale '44** moved from Philadelphia to Texas to work on the agency's spacesuits and life-support equipment. His impressive career included determining how to remove carbon dioxide from the air that enveloped the astronauts in the tiny Apollo 13 spaceship in 1970. In 1979, he retired having served as chief of the NASA Crew Systems Division.

Though he never worked for Correale, **Tom Sanzone '68 EE** began his NASA career in that same division. Assigned to The Johnson Space Center in Houston, Sanzone worked for Hamilton Sundstrand (now United Technologies Corp. Aerospace Systems) and trained Neil Armstrong and other Apollo astronauts in the use of the company's Portable Life Support System backpack worn on the moon. Sanzone became engineering manager for the company's spacesuit, after which he served as general manager of the Houston office for 22 years until retiring in 2011. During his 43-year career, Sanzone was awarded NASA's Exceptional Public Service medal. Today, he is a member of the Villanova University Alumni Association Board of Directors and has been instrumental in connecting current and recent Villanova engineers with opportunities in the aerospace industry.

In 1977, Villanova's College of Engineering graduated its first future astronaut, Mechanical Engineering major **Andrew "Andy" Allen**. Allen spent 10 years at NASA, during which time he conducted three space flights, logging 900 hours on the space shuttles Atlantis and Columbia. Allen also served as director of the International Space Station (ISS) Program in Washington, D.C. Today, he is CEO of Aerodyne Industries LLC, and the project manager for the Test and Operations Support Contract at Kennedy Space Center.



Neil Armstrong and Tom Sanzone '68 EE in 2004.

### Leading Today's Flights

Following in the footsteps of the College's first NASA pioneers, dozens of Villanova Engineers have interned, conducted research and held a variety of positions with the agency. **Brian T. Smith '93 EE** began his career as a flight controller at The Johnson Space Center in 1998. In 2005, he was selected as one of nine new mission control flight directors, and by 2008, he was leading his first flight. Smith led a variety of missions over the next six years for which he earned NASA medals for leadership, service and achievement.

Smith's current mission is the Bigelow Aerospace Expandable Module (BEAM), and he has spent most of his time working on the module's deployment, a first for the ISS.



Brian T. Smith '93 EE in NASA's Mission Control Center during the Orb-1 Cygnus mission to ISS.

### Faces of Tomorrow

The allure of space exploration continues to call to Villanova students. **Samantha Testa '16 ME** is pursuing a Villanova master's degree in Mechanical Engineering through the College's E-Learning program, while working full time this summer as a Pathways Co-op at Kennedy Space Center. This is Testa's third summer with NASA; she is an Engineer in Training with the Structures and Mechanisms Design Group in Ground Systems Development and Operations.

Testa acknowledges the Villanova connections that have led her to NASA, "Tom Sanzone has been invaluable to me as a mentor and has helped me make connections in the NASA community." In addition to the support she has found in Sanzone, Testa worked closely with Villanova Mechanical Engineering Professor Sridhar Santhanam, PhD, as the experimentation lead on a NASA launch pad refractory material project.

After the co-op program, Testa hopes for a full-time position in structures and mechanisms, "potentially followed by training astronauts at The Johnson Space Center, and ultimately becoming an astronaut myself." She



Andy Allen '77 ME met with intern Samantha Testa '16 ME. She recalls, "Despite his busy schedule, he found time to meet with me; what was scheduled as a 30-minute meeting quickly turned into two hours of astronaut advice and chit chat."

recognizes this will be no easy feat. In 2015, NASA received a record 18,000-plus applications from which they will select 14 for the coveted position.

Another student who feels NASA's pull is **John Paul Naughton '18 ME** who has held two summer internships at Ames Research Center. In December 2015, Naughton connected with a family friend who works on the research center's lunar plant project. The need to test a project-related irrigation system's feasibility for use on the moon led to Naughton's experience on the so-called "Vomit Comet."

As part of the Ames team, Naughton took a 2.5-hour parabolic flight on which he helped test the pump's effectiveness in the moon's gravity.



John Paul Naughton '18 ME represents Villanova in weightlessness on the so-called "vomit comet."

"As the flight reaches its maximum height and makes its way down, that's when you experience a brief period of weightlessness, about 30 seconds," he explains. Naughton is applying for another internship at the Ames Research Center in the hopes of expanding his experience and skillset. His goal is to become a Navy pilot.

### Fueling the Passion

Beginning next fall, Villanova's College of Engineering will offer a new Aerospace minor to introduce contemporary topics in aerospace engineering to undergraduate students. "The goal of this minor is to broaden their knowledge in this area and to provide them with the in-depth training necessary to enter the specialized aerospace field," says Mechanical Engineering Associate Professor Ani Ural, PhD, who, as curriculum chair, helped make the new program a reality. The minor will consist of 27 credits, including required courses in Elements of Aerodynamics and Aerospace Vehicle Design. A variety of electives include Compressible Fluid Flow, Introduction to Finite Elements, Flight Dynamics, Orbital Mechanics, Fiber Composite Structures and more. ■

### "WORKING FOR NASA"

by Brian T. Smith '93 EE, NASA lead flight director

First, and most importantly, find something you really enjoy doing. Look into NASA field centers to learn what they specialize in and decide which areas match most closely what you enjoy doing. Explore opportunities with both NASA and NASA contractors. There are pros and cons to both. Work hard in school, and participate in extra-curricular and volunteer activities. NASA attracts the best and brightest. Prepare for the competition by excelling in all you do at Villanova and be confident that Villanova has prepared you to stand among the best in the country.