

AEROCOM

JOHN D. ODEGARD SCHOOL OF AEROSPACE SCIENCES

WINTER 2017



UND
UNIVERSITY OF
NORTH DAKOTA

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A MESSAGE FROM THE DEAN

Greetings to all from the beautiful north country on this cold January day! As UND Aerospace begins its 49th year, we are excited for the opportunities to come in 2017. However, while I gaze out my office window and admire the beauty of North Dakota sundogs in the afternoon sky, let me reflect on some major 2016 UND Aerospace accomplishments.



The ribbon cutting for Robin Hall on July 26th was truly a memorable event as we dedicated our first new building to our on-campus complex in nearly 25 years. It was great to have Si and Betty Robin, Clay Lacy and Joe Clark here for the dedication along with Senator Hoeven, Congressman Cramer, our new University President, Mark Kennedy, as well as many other friends of UND Aerospace. The inspiration the new building provides for our organization is enormous and we are truly indebted to our primary donors, Si and Betty Robin, as well as James Ray. Having Bruce and Ann Smith back for the dedication as well as guests Diane and Stephanie Odegard was indeed a treat. Our students, staff and faculty very much appreciate the new space, allowing us to accomplish even greater things as we continue our tradition of excellence. Thank you to the UND Aerospace Foundation for assisting in providing this magnificent building! John Odegard Sr. and Tom Clifford were definitely smiling down on us that momentous day and we recognize them for their vision to create the Aerospace Foundation.

Another significant event during the fall semester was the appointment of Dr. Beth Bjerke as our new associate dean. We thank Dr. Santhosh Seelan, Professor of Space Studies for serving as interim associate dean while we conducted an internal search. Welcome Dr. Bjerke to the Dean's Office! Since Beth was serving as Aviation department chair, we conducted an internal search for a new chair and we congratulate Professor Jim Higgins as the new Aviation department chair effective January 1st. In addition to these two appointments, the Space Studies department received international acclaim when Dr. Pablo De León and his space suit research were featured in the November issue of National Geographic Magazine. Dr. De León also presented his space suit research at the Smithsonian Institute in Washington, D.C.

We received exciting news in August from the FAA that we were on the winning team of universities designated as FAA Centers of Excellence for Technical Training and Human Performance. This is the second FAA Center of Excellence that UND is a part of, the other being the FAA Center of Excellence for Unmanned Aircraft Systems. We also received great news in December when our aerobatic team won their 9th consecutive National Championship. Congratulations to Head Coach Mike Lents and the entire team!

We're looking forward to a superb year and wish each of you the best in 2017. Thank you for your continued support of the John D. Odegard School of Aerospace Sciences as well as the entire UND Aerospace organization.

Paul Lindseth | Dean, John D. Odegard School of Aerospace Sciences

A handwritten signature in black ink that reads "Paul D. Lindseth". The signature is written in a cursive, flowing style.

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“When I first started teaching I was a hard teacher. Now it has become more about what the students learn, not about a grade.”

– Leon Osborne, page 11

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Mark Kennedy President, University of North Dakota
Paul Lindseth Dean, John D. Odegard School of Aerospace Sciences
Beth Bjerke Associate Dean
Ken Polovitz Assistant Dean
Editor **Josh Christianson**
Copy Editor **Neil Nowatzki**
Design & Layout **Courtney Olson**
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Full article on page 9 | Cover Photo Credit **Jackie Lorentz**

AEROBATIC TEAM WINS 9TH CONSECUTIVE CHAMPIONSHIP



The International Aerobatic Club (IAC) announced that the UND Aerobatic Team has won the IAC Collegiate National Championship Team Award for the ninth consecutive year.

UND students captured the top two Individual Collegiate Champion Awards. Patrick Mills ranked 1st and James Jacobson finished 2nd in his first season. Additionally, students Alexander Volberding and Christiaan Schrimpf placed 4th and 5th overall among collegiate pilots flying in the Sportsman category or higher.

“These results truly show the depth, determination and discipline that UND students display day in and day out. The UND Aerobatic Team highlights UND’s commitment to excellence,” said Head Coach Michael Lents.

The winning 2016 team consisted of students Patrick Mills, James Jacobson, Alexander Volberding, Christiaan Schrimpf, John Perillo, Nick Meyer, Michael VanderMeulen, Alex Tally, Estin Johnson, Alex Hunt, and Austin Rennard. Michael Lents was assisted by Coach Jonathan Sepulveda, Safety Pilots Bryan Strathdee and Mitchell Oswald, and Faculty Advisor Joe Vacek.

Throughout the summer and early fall, the team competed across the Midwest in IAC contests. Open to any aerobatic pilot, UND students routinely compete against professional airline, corporate, airshow and military pilots as well as engineers, computer scientists, business professionals and many others who train for competition. Judges grade sequences and maneuvers against specific criteria for accuracy, energy management and presentation. Deductions are applied for minor errors in heading and attitude during spins, loops, rolls, and hammerheads. Top marks are hard won.

The 2016 season began in June with the Midwest Aerobatic Championship in Seward, Neb. The next contest was the Doug Youst Challenge in August in Spencer, Iowa. The season concluded at the IAC National Championships in Denison, Texas. Nick Meyer, Michael VanderMeulen, and Alex Tally placed 1st, 2nd, and 3rd at Nationals in the Primary category. James Jacobson won 3rd place with Christiaan Schrimpf ranking a close 4th in the Sportsman category.

The UND Aerobatic Team participates in the IAC Eagle Collegiate National Championship Award Program. Since 2001, this program has increased interest and participation in aerobatic flight by encouraging and recognizing the achievements of young pilots through team and individual collegiate awards.

—*Mike Lents*

OPEN FOR BUSINESS



Si and Betty Robin, flanked by University and government officials, as they cut the ribbon for UND's newest building, Robin Hall.

A buzz of excitement filled one of UND's newest buildings on July 26, as University officials, dignitaries and members of the public gathered to cut the ribbon on Robin Hall on the far west side of campus.

Several distinguished speakers took the podium, including Sen. John Hoeven, R-N.D., Rep. Kevin Cramer, R-N.D. and UND President Mark Kennedy, to recognize the people who made the new building possible.

Speaking to Si and Betty Robin, lead benefactors for whom the building is named, Hoeven said, "Visionary things don't happen without visionaries," to which the crowd generously applauded. The Robins are behind the success of Sensor Systems, a California-based manufacturer of aerospace antenna.

The 66,000-square-foot Robin Hall was funded largely by private donations and \$1.5 million in matches from the North Dakota State Board of Higher Education Challenge Fund. The state authorized UND to spend up to \$25 million on the project.

Robin Hall is now home to the Center for Unmanned Aircraft Systems Research, Education and Training, as well as the UND Aerospace Foundation.

SELF-GUIDED TOURS

As the ribbon was cut, the words "we're officially open for business" resonated throughout the crowd as the attendees

began their self-guided tours of Robin Hall.

Entering Robin Hall through the automatic doors on the north side, a grand auditorium is set just to the left. Furnished with student study areas, this open space also includes a huge projection screen and nine thin, rectangular televisions above and below a staircase leading to an open balcony overlooking the auditorium.

Beyond the auditorium are classrooms and a small "hangar," designated as a flight-test lab, where UAS students can practice maneuvers with one of the several unmanned aircraft available to them.

Down the hallway from the northern entrance is the Aerostop store, with large panels of glass lining the front, providing a view of all the UND Aerospace items and memorabilia available for purchase. Just across from Aerostop is a massive "UND Aerospace Legacy Wall," which pays tribute to donors and contributors to the new building: James C. Ray, Clay Lacy, Joe Clark and the Robins.

The upper levels of the building are filled with classrooms, student study rooms, common areas, faculty offices, boardrooms and administrative offices. The entire building is in the form of a picturesque pillar covered with glass windows and reaching high above every structure around it, signifying the "sky is the limit" for aviation at UND.

—Matt Eidson

REFINING THE FLEET



Jackie Lorentz

Inside the new Piper Archer TX (front to back): Brody Graff, Maple Grove, Minn.; Luke Schurtz, Chicago, Ill.; and Max Lambrecht, Shakopee, Minn.

UND Aerospace has some new hardware on its flight line this year in Grand Forks, and there's more coming.

UND has taken delivery of eight Piper Archer single-engine training aircraft so far, with plans to add many more over the next few years. Eventually, UND would like to see as many as 60-65 Archers as part of its fleet. New Piper Seminole multi-engine aircraft are also arriving, gradually replacing the existing fleet of 16 older Seminoles.

All told, according to Dick Schultz, UND Aerospace director of flight operations, the flight school currently has about 90 fixed-wing aircraft and helicopters in its training fleet in Grand Forks.

The low-wing Archers will largely replace the Cessna 172 Skyhawk aircraft that UND has been using for private pilot and commercial pilot certification training. "But the avionics are all the same on these aircraft, so it's a very easy transition for our student pilots," Schultz said.

Schultz says the changeover is going really well. Once the Federal Aviation Administration authorizes use of the new Archers for training, UND will get its instructor pilots trained on the new planes so they can, in turn, start training students on a variety of piloting skills.

Schultz says there's a methodology involved with selling and purchasing aircraft for an operation like UND Aerospace with such a large training fleet. "What we really don't want to do is a mass sale of aircraft," Schultz said. "For starters, it's difficult to sell 60 aircraft at once, and at the same time, we don't want to flood the market."

With the school's multi-engine Seminole training aircraft, the process is a little easier because UND is currently operating those aircraft and because there are far fewer, Schultz said, "As we sell one, we just bring a new one in."

—David Dodds



5 YEAR RECIPIENTS

Travis Desell, Assistant Professor, Computer Science

Colt Iseminger, Lecturer, Aviation

Kari Johnson, Accountant, Fiscal Affairs

Aaron Kennedy, Assistant Professor, Atmospheric Science

Steven Martin, Altitude Chamber Manager, Aviation

Kelli Puckett, Administrative Secretary, Flight Support Services

Cody Stauffer, Lead Instructor/Flight Manager, Flight Operations

Benjamin Thigpen, Lead Instructor/Flight Manager, Flight Operations

Trevor Woods, UAS Operations Manager, Test Site

10 YEARS

Mark Dusenbury, Associate Professor, Aviation

Rex Ginder, Site Manager, Mesa Flight Training Center

Danny Holwerda, Flight Line Manager, Flight Support Services

Dan Malott, Assistant Professor, Aviation

Rebecca Romsdahl, Associate Professor, Earth System Science & Policy

Chad Symington, Aircraft Technician, Flight Support Services

Chris Theisen, Radar Research Technician, RWIC

Gary Ullrich, Assistant Professor, Aviation

15 YEARS

Mark Askelson, Associate Professor, Atmospheric Science

Andrew Capouch, Aircraft Technician, Flight Support Services

Michael Gaffey, Professor, Space Studies

Karen Katrinak, Science Analyst, Earth System Science & Policy

Eunjin Kim, Associate Professor, Computer Science

Chad Martin, Course Manager, Flight Operations

Leslie Martin, Associate Professor, Aviation

Xiaodong Zhang, Full Professor, Earth System Science & Policy

20 YEARS

Henry Borysewicz, Director, Aerospace Network and the Scientific Computing Center

Sandra Gust, Account Technician, Fiscal Affairs

Doug Olsen, Senior Research Associate, UAS Center of Excellence

Andrea Sandahl, Administrative Records Clerk, Flight Operations

Paul Snyder, Assistant Director of Extension Programs, Flight Operations; Assistant Professor, Aviation Department

25 YEARS

Wally Pfennig, AIMS Lead Program Analyst, ASN

30 YEARS

Tom O'Neil, Associate Professor, Computer Science Department

35 YEARS

Tammy Anderson, Administrative Secretary, Flight Support Services, Line Office

Brian Milling, Aircraft Inspector, Quality Assurance, Flight Support Services

40 YEARS

Mike Poellot, Chairman, Atmospheric Sciences

Kent Streibel, CRJ Flight Instructor, Flight Operations

NICK EBERLING

Recipient of the Young Alumni Achievement Award

Q: WHAT DOES IT MEAN TO YOU TO RECEIVE THE YOUNG ALUMNI ACHIEVEMENT AWARD?

A: It's really humbling - a total surprise - and it's an opportunity to reflect on the intersection of a dream and reality. Ever since I was a kid, my dream has always been to fly airplanes professionally and potentially to do that while serving the country. Through a lot of hard work and mentorship from other people, I have been able to achieve this dream, and so I think the award is not so much about me, it's an invitation to think back and express my gratitude to all those folks that helped to forge the path that I've been so lucky to embark on, many of whom are at UND.

Q: HOW DID YOU END UP CHOOSING UND?

A: We lived out East in a Washington D.C. suburb, and my father and I visited a lot of different schools. The first thing that struck me about North Dakota was the people. I don't mean to be trite by saying that, but honestly you'll never find a friendlier, more welcoming, more genuine group of people than those that you find in the Midwest. Since then I've kind of been fascinated with how the people you surround yourself with mold you as a person. At UND I found a college full of people that I wanted to surround myself with.

I'd already been flying for many years before attending UND, and in their aviation program I found people that were as passionate about flying as I was.

The ability to get a balanced education was really on my mind. I think it's a virtue to be able to focus on something and to work hard and achieve your primary goal, but I also wanted to receive a quality, balanced education, surrounded by people with diverse interests, and that's exactly what I got at UND.

Q: DID YOUR EXPERIENCE AS A UND STUDENT MEET YOUR EXPECTATIONS?

A: It absolutely did. I'm very grateful to the professors that mentored me along the way. Like many college students, I made some poor choices and had a couple of stumbles along the way. I tell high school students that you shape who you are based on the decisions that you make. When everything's not going perfectly, you choose to either keep your head up and keep working or you choose to give up. The aviation professors at UND believed in me and encouraged me to work hard and keep the dream in sight. That meant a lot and definitely paved the way for me to continue on this journey.

Q: DID YOU DO ANY MILITARY TRAINING WHILE YOU WERE IN COLLEGE?

A: I was fortunate enough to be a part of the Air Force ROTC program at UND, so I was able to have a normal college education experience, enroll in the ROTC classes, and receive an ROTC scholarship. From the moment I set foot on campus I knew that I wanted to serve the country in some way. I thought that flying in the Air



Force was going to be the best way to do that.

Q: WHAT WAS IT LIKE JOINING THE AIR FORCE AT THAT TIME?

A: I served as a combat fighter pilot in the F-15E Strike Eagle. I had the honor of deploying to Afghanistan a few times and flying all kinds of missions over there, like close air support for troops in harm's way. It was a huge honor, very humbling, and an unforgettable experience to be able to serve in that capacity.

Q: CAN YOU DESCRIBE WHAT IT MEANS TO YOU TO BE A THUNDERBIRD PILOT?

A: A Thunderbird F-16 has one of the highest thrust-to-weight ratios of any fighter aircraft ever built, so the thing is a ride like no other, able to accelerate going straight up. It's an incredible, physical experience. But I'm most excited about the Thunderbirds as a platform to inspire people, especially kids. I love that a red, white and blue team of fighter jets can put a smile on people's faces and maybe inspire them to follow their own dream.

—Milo Smith

LEON OSBORNE: IN HIS OWN WORDS



Jackie Lorentz

Leon Osborne's passion is astrophysics. More specifically: stellar and planetary atmospheres. This might sound like a strange passion since he has been teaching atmospheric sciences at UND for 38 years. Wanting to provide for his family, he quickly realized there were not many careers in astrophysics.

"I was a master of science student at the University of Oklahoma and nearing completion. Kathy and I were married and we had a young son. My advisor was approached by a colleague and was told that UND was having a difficult time finding someone for a research program," says Osborne.

"My advisor said 'I think you need to take a trip and call it a practice interview or whatever you want. You probably won't be interested in the job but go up and take a look.' So I did."

THE UNIVERSITY

After arriving in Grand Forks and spending a day on the UND campus,

Osborne was underwhelmed. The job, a data processing coordinator position, was only scheduled to last a couple of years. The second day was more of the same. At the end of the second day, every interviewee was required to do a ten-minute exit interview with John Odegard.

"My ten minutes turned into a half hour," says Osborne. "He and I hit it off. It was kind of magic, how we meshed with one another. He told me what his dreams and desires were and asked me what mine were and I shared that with him. He looked me square in the eye and said, 'If you come up here you can do anything you want, as long as you are successful, and I will support you.' That was the promise John made to me. I went back to the airport, called Kathy and said, 'Pack your bags we are moving to Grand Forks.'"

"John asked me to write down ten things I wanted the most. I wrote them down and we each had a copy.

We would meet every year and review the list. Fortunately, I was successful at what I was doing and he lived up to his word."

The only item on the list Osborne did not accomplish was to earn his Ph.D. He planned to do so when he was in Oklahoma but then left to begin his career in North Dakota. In the years that followed he occasionally felt ready to go back to school, but a new opportunity always seemed to present itself. "Do you go back and finish school or do you seize this opportunity and run with it? The answer was always to seize the opportunity at hand and run with it."

Osborne's new job of processing weather data was at the division of atmospheric research within the Department of Aviation, which at the time was housed in the business college. Osborne recalls, "It was not a prestigious position, and did not pay a lot, and that was the challenge. How do



Jackie Lorentz



Jackie Lorentz

you take this position and turn it into something that you can really build on? At that time no one wanted to work on wintertime weather information, and that was what I was working on. Since I was the only one working on the program, I had the ability to build it how I wanted it. Over the next 4-5 years I transformed it from processing radar data into doing good science. We built a science research program out of that little program, known as the Sierra Cooperative Pilot Project (SCPP).”

A BETTER FORECAST

Growing up on a farm in Texas, Osborne was fascinated by watching the clouds, seeing them turn into thunderclouds, and then seeing those produce tornados and severe weather. He wanted to work to help warn people about these impending storms.

“The whole purpose of atmospheric sciences is to make a better forecast,” says Osborne. “To do that, you have to know how the atmosphere works. In order to do that, you have to do some rather sophisticated research. With many other sciences you can replicate things in a laboratory. In atmospheric sciences the Earth’s atmosphere usually is the laboratory, and it is very hard to replicate. There are unique challenges with it. All of this leads to the end game which is to make a better forecast, which goes into the societal benefit of atmospheric sciences. Historically, in

North Dakota, you find people who perished simply going two miles from town to home because they got caught in a blizzard or major storm. How can we help protect life and property today? There is a significant societal benefit of atmospheric sciences.”

BEING SUCCESSFUL

As promised, Osborne has been successful throughout his career. He helped build the Atmospheric Sciences program, curriculum and department. He has been honored with many awards, both locally and nationally. His research helped develop the Advanced Traveler Information System (known as the current 511 travel information system).

How does Osborne measure success? “Being recognized by your peers shows you are doing good work. We presented our work and had it critiqued by top-notch scientists. Other measures of success are meeting the goals of the program, creating new knowledge, and providing benefits to society. We were always fighting for funding, which can also be a measure of success. We did bring in a lot of money, but we always looked at it from the standpoint of, ‘What did you do with it? Did you do any good?’”

A VISION

Osborne wrote part of the proposal to develop the undergraduate

Atmospheric Sciences program and directed the program for over a decade. He took on a similar leadership role in helping to create the graduate program, which offers both master and doctorate degrees. When the graduate program was formed, he became the graduate director. Osborne is also a Chester Fritz Distinguished Professor of Atmospheric Sciences, the highest award given to a faculty member at UND.

“You can’t describe the feeling you get when you receive such an honor. It is one I never thought would occur. I am greatly indebted to all of the people across campus that supported the nomination because there was support not just from the aerospace program but also across campus.”

When he was bestowed with this honor, he realized he had to work even harder. “It is a tremendous honor and a tremendous responsibility because you become a role model for the rest of the faculty. I am always proud to be flag marshal at commencement because that is always a Chester Fritz Professor.”

THE STUDENTS

Osborne’s favorite part of his career has always been the students. He relishes the challenge of helping his students.

“My teaching style has really evolved



over the years. When I first started teaching I was a hard teacher. Now it has become more about what the students learn, not about a grade. It is working with students, trying to get the best out of them, and getting them to understand their potential. That is what it's all about—treating students as individuals, not just as another marker on the class board. A better measure of success, other than grades, is getting them to understand who they are, what their aspirations are and matching that with their talent.”

Osborne has been diagnosed with pancreatic cancer and he and Kathy have decided he will work as long as he can. This semester he is teaching two graduate classes while undergoing chemotherapy, which can offer its own unique challenges.

“Some days it's having a bottle of water and being able to croak out a few words. The students all know what the situation is.”

Osborne's wife, Kathy, shared, “The students watch out for him. With their interaction in class, sometimes when he can't carry the load, they pick it up and carry it.”

Students from his very first year of classes have been in touch with Leon and Kathy. “It has been gratifying because a lot of these students you've

helped along the way are now returning the favor,” says Osborne.

Osborne and Kathy have been married for 41 years and have three sons and a granddaughter. His students have gotten to know all of them, especially Kathy, and she knows most of his students, he says. “That's the way it has always been. It's the UND family. The atmospheric sciences family.”

—Jena Pieve

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Osborne and his team developed the "Advanced Transportation Weather Information System" (ATWIS) at the Regional Weather Information Center in Odegard Hall.

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Left: ATWIS evolved into today's 511 system, used by state road information services across the country.

Right: At a recent symposium honoring Osborne's professional accomplishments, he received a signed photo from students, thanking him for his leadership and guidance.

Page 11:

Left: Osborne has revolutionized how meteorology information is delivered nationwide through on-demand public interfaces that are timely and accurate.

Right: Atmospheric Sciences Chair Michael Poellot, Professor Leon Osborne, and Professor Tony Grainger



Wes Van Dell

UND UPDATES FLEET WITH R44

UND Aerospace has added the Robinson R44 Cadet to its helicopter fleet in Grand Forks. This is the first time since 1996 that UND has acquired a new type of helicopter. The R44 Cadet is a two-place version of the R44, the world's best-selling helicopter. Robinson Helicopter Company, based in Torrance, Calif., manufactures about 200 R44s every year. The Cadet is a derivative of that successful design, offering a higher TBO and lower price, designed specifically for the training market. Robinson Helicopter outfitted UND's Cadet with the latest in Garmin avionics, including the G500H glass cockpit and GTN 750 touchscreen GPS, offering UND students the best technology in the industry.

UND Aerospace conducts all of its

helicopter flight training in Grand Forks, flying about 5,000 hours annually. UND's helicopter fleet consists of five Sikorsky H300Cs, all outfitted with Garmin G500H glass cockpits. Adding the Cadet to the fleet offers students a higher performance aircraft for instrument training and beyond. Capable of cruising comfortably at 110 knots, it is a much faster aircraft than the H300, making it well-suited to instrument training. It also provides students with invaluable experience in one of the most widely used helicopters for entry level jobs, including flight training.

To gain experience in the new helicopter, Chief Flight Instructor Ron Depue and helicopter instructor Wes Van Dell accepted delivery of the R44 in Torrance

along with Don Dubuque, Director of Extension Programs. Ron and Wes then flew the helicopter on a 1,900 mile journey across the United States to its new home in North Dakota. The six day flight gave them a unique perspective on the helicopter's performance and handling in different situations, from the Sonoran Desert to the Organ Mountains and the central plains.

Now that the aircraft has arrived in Grand Forks, instructors and maintenance will begin the standardization process. The aircraft will be available for student training at the end of the spring semester. Starting in the Fall 2017 semester, the helicopter instrument course will be flown solely in the R44.

—Wes Van Dell

RAMP CONSTRUCTION AND RIBBON CUTTING



“It is incredibly rewarding for UND Flight Operations to receive this grant from the ND Legislature. Through a change in FAA funding priorities our area was no longer eligible for reconstruction funds; the ND Legislature recognized our value to the city, region, state and national aviation landscape and provided us much-needed funding to enable our program to remain competitive, and continue to attract the top aviation students in the world.”

—*Kimberly Kenville, Professor, Aviation*



“Receiving this critical funding for our UND Flight Operations infrastructure has immeasurable value to UND Aerospace. Ordinarily, a project for Flight Operations would be funded by student flight fees, and with the ND Legislature stepping up to fill this critical financial gap, it allows the students to enjoy the badly needed infrastructure upgrade without bearing the costs associated with it. The ramp was becoming a safety issue with Foreign Object Debris (FOD) and we are entirely grateful to the Legislature and the University system for seeing the importance of this project for our Aviation curriculum and supporting it.”

—*Dick Schultz, Director, UND Flight Operations*



Pictured far left: First Officer John Klinger, Delta Airlines

ALPA NEWS

The Air Line Pilots Association, Int'l (ALPA) recently recognized Delta Air Lines First Officer John R. Klinger with its Air Safety Award for advancing ALPA's safety interests for over two decades. First Officer Klinger was presented with this prestigious award at ALPA's 62nd Air Safety Forum in Washington, D.C.

Klinger's work on aviation safety issues with Delta has been instrumental in setting a benchmark for voluntary reporting programs across the industry. As an advocate for the advancement of voluntary safety programs, which identify potential safety issues as they arise, his efforts have led to a better understanding of reported issues and to safety process improvements at Delta Air Lines.

"First Officer Klinger's dedicated work to enhance aviation safety can be felt today and will continue to have a lasting effect within our industry for years to come," said Capt. Tim Canoll, ALPA president. "His compassion and commitment to his fellow pilots set him apart, and his collaborative efforts to ensure real progress have earned him the respect from crewmembers and management alike."

A 1990 graduate of UND with a degree in Aviation Administration, Klinger served as a Base Safety chair for American Eagle before bringing his valuable experience to Delta Air Lines, where he has held several safety-focused positions throughout the years. Following the Delta/Northwest merger in 2008, he was appointed to the Flight Operations Integration Analysis Team, which has been heralded as an industry model on how to integrate two complex and vastly differing airline operations.

Klinger's lasting contributions stem from his keen ability to recognize early on the valuable safety information that could be gleaned by allowing voluntary safety reporting systems to interface. His efforts in a groundbreaking "CrossTalk" agreement allowed Delta to better understand risk and improve safety processes, demonstrating what the industry can achieve with safety reporting programs when there is a positive, collaborative approach from all parties.

—*Air Line Pilots Association*

HIGH-TECH TRAINING

UND Aviation students, faculty and staff members recently got a glimpse of just how high-tech their flight training can get without leaving the ground.

Rockwell Collins recently visited the school and brought some of its new training gear for students to try out. UND Aerospace and Rockwell Collins have a long-standing relationship involving research ventures and funding support for students, but this was the first technology presentation of this scale, according to Nick Wilson, UND assistant professor of aviation.

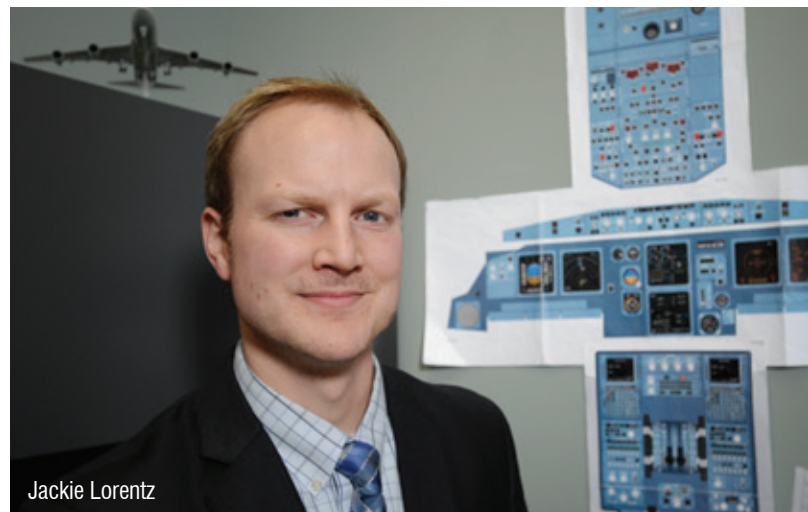
One of the pieces Rockwell Collins demonstrated was its Virtual Avionics Procedures Trainer (VAPT), which the company donated to UND for research and student aviation training. The VAPT uses arrays of touch screens to simulate the cockpit, instrumentation, and avionics of a wide variety of aircraft.

Rockwell Collins decided UND Aerospace was a good recipient for the VAPT because of its value as a tool in ongoing research efforts, and because UND possesses a training fleet of King Air C90 aircraft. The VAPT is currently configured with flight management system software common to that particular aircraft.

UND students, faculty and staff tested out the VAPT technology at Ryan Hall while others took turns on Rockwell Collins' virtual reality equipment in the Robin Hall unmanned aircraft systems lab. The Rockwell Collins team included Alex Postnikov, Paul Heyd, Jeannie Davison and Kirk Thorson. Heyd, Davison and Thorson, part of Rockwell Collins' Simulation and Training Division, demonstrated the equipment.

Representatives of UND Aerospace (Aviation, Computer Science, Flight Operations and Maintenance) were joined at the presentation by UND staff and faculty members from Electrical Engineering, Mechanical Engineering and Psychology in a show of the multi-disciplinary and collaborative interests that exist in aviation research on campus.

“Aviation is a discipline which requires careful consideration of design, control and safety from a multitude of angles when considering how humans interact with machines,” Wilson said.



Jackie Lorentz

Nick Wilson, Assistant Professor, Aviation

For instance, he continued, “the size, shape and location of controls and switches have psychology or human factor considerations. As we (pilots) bring all of our pre-established experiences and associations, we have to communicate these needs and requirements for human-machine interface to the engineers to incorporate into designs.”

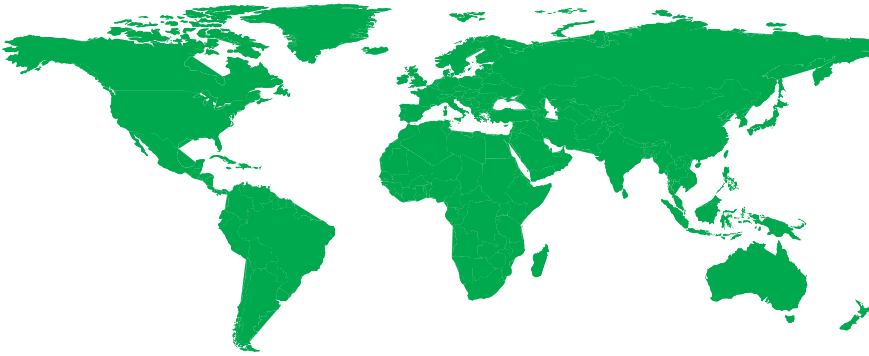
Then there’s the student-training aspects of Rockwell Collins’ simulation technology, which provides low-pressure, low-cost environments for aspiring pilots to learn their craft.

“Rather than training in a noisy cockpit while consuming precious time and fuel, the VAPT can bring the learning into a temperature-controlled environment where students can master basic skill sets prior to moving to the real-world training environment.”

—David Dodds

ALUMNIPROFILE

156 INTERNATIONAL GRADS



Argentina, Australia, Belgium, Bolivia, Canada, China, Croatia, Estonia, Germany, Greece, Guam, Hong Kong, Iceland, India, Italy, Japan, Mexico, Nigeria, Norway, Pakistan, Papua New Guinea, Puerto Rico, Russian Federation, Saudi Arabia, Singapore, St Lucia, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, Virgin Islands

GRADS BY MAJOR



TOP 10 CITIES FOR ALUMNI

- Grand Forks, ND
- St. Paul, MN
- Minneapolis, MN
- Bismarck, ND
- Fargo, ND
- Lakeville, MN
- Colorado Springs, Co
- Rochester, MN
- Seattle, WA
- Denver, CO
- West Fargo, ND
- Prior Lake, MN

8721 NATIONAL GRADS

AL	37	MT	128
AK	81	NE	71
AZ	226	NV	79
AR	14	NH	37
CA	403	NJ	55
CO	486	NM	30
CT	29	NY	96
DE	9	NC	94
FL	225	ND	1013
GA	164	OH	108
HI	60	OK	27
ID	73	OR	93
IL	280	PA	70
IN	55	RI	13
IA	106	SC	44
KS	61	SD	119
KY	38	TN	73
LA	16	TX	373
ME	14	UT	57
MD	76	VT	5
MA	34	VA	218
MI	108	WA	433
MN	2403	WV	13
MS	19	WI	315
MO	67	WY	35

ALUM ROBERT MITCHELL, '09, SHARES LOVE OF FLYING AND WEATHER



Lieutenant Robert Mitchell pictured during a flight.

Lieutenant Robert Mitchell, '09, has combined two passions into one unique job. He began working as a “hurricane hunter” with the National Oceanic and Atmospheric Administration (NOAA) shortly after graduating in 2009 with bachelor’s degrees in Aeronautics and Atmospheric Sciences. After flying in hurricane Matthew in October 2016, Mitchell had a chance to share his story and the impact UND had on his career.

Originally from Glendale, Ariz., Mitchell knew early on that he wanted to fly airplanes. “For my 16th birthday,” says Mitchell, “I asked for a discovery flight. After a half-hour flight in a Cessna 172, I could officially say I flew

faster than I had driven at that point.”

Mitchell chose UND because of the reasonable tuition and costs compared to other universities. “My mother would not let me pursue an aviation degree without having a backup of some sort,” he said, “which meant getting a degree in something not aviation related in case something would prevent me from flying in the future. Once I began learning more about weather, I was happy to choose that as a second degree.”

At UND he was a member of the UND Wilderness Pilots Association, a flight instructor, a resident assistant,

and a lab assistant for Dr. David Delene, and he worked on a couple of research projects with Professor Michael Poellot.

Mitchell learned about NOAA through a homework assignment for class. While searching several weather services websites, he ran across the words “NOAA Hurricane Hunters.” His interested was piqued!

“It was a pretty cool combination of the two disciplines I was studying,” said Mitchell. “Being able to combine aviation experience with the science background I was learning, it was intriguing.”



The NOAA Commissioned Officer Corps (NOAA Corps) is one of the nation's seven uniformed services. With 321 officers, the NOAA Corps serves throughout the agency's line and staff offices to support nearly all of NOAA's programs and missions. The combination of commissioned service and scientific expertise makes these officers uniquely capable of leading some of NOAA's most important initiatives.

Mitchell is based out of MacDill Air Force Base, near Tampa, Fla., which is a prime location for his role as a hurricane hunter. The NOAA fleet includes two Lockheed WP-3D (P-3) Orion "Hurricane Hunters" which play a key role in collecting data vital to tropical cyclone research and forecasting. The P-3 flies into the storm in a figure four pattern. In addition to using dropsondes, it has bathymetric buoys which can measure ocean temperature.

NOAA also uses a Gulfstream IV-SP (G-IV) twin-engine jet for hurricane forecasting and research. The G-IV flies around and over developing tropical

storms and releases dropsondes, which measure temperature, pressure, dew points, wind speeds and other data that goes into the models to help determine where the storm is headed.

"During Hurricane Matthew there were 180 hours of flight time between our P-3 and the G-IV research jet. That is essentially two missions per day, two crews per day, with 10-hour flights," says Mitchell. On a hurricane flight there are usually about 18 people. This includes three pilots, two flight engineers, a navigator, one or two flight directors (onboard meteorologists), and other scientists.

Flying into a hurricane is its own adventure. "It is pretty sporty," said Mitchell. "We try to stay out of the convection until we actually get to the core of the storm. There is five to fifteen minutes of pretty intense concentration to get through the turbulence and through the eyewall. Once we get to the center of the eye it is very smooth again. At this point we are doing turns to try to put the airplane right into the center of where the winds go to zero—and then

everything gets bundled back down and we fly back through the other side."

When Mitchell thinks about the best part of his job, flying is the first thing that comes to mind. "A close second is knowing that what you are flying for is doing some good. Often we get to see the research papers that have come from our work, or we talk to the scientists and hear about population assessments. Or with a hurricane, getting to see the intensity forecast change as we go in and out of the storm is gratifying."

Mitchell is the first to admit that the planes he flies have their own challenges. The planes are older with less instrumentation.

"When I started school in 2004, most of the Piper Warriors still had the older-style instrumentation. At the very end of my training, and when I was flight instructing, was when UND went to the Garmin 1000. I was lucky I had a little experience flying simpler planes. The pilots who have only flown the newer planes feel like they are in a time warp when they see the P-3."



“The training I received learning to fly the planes in the NOAA Corps,” he continued, “focused on knowing exactly what everything does. It harkens back to a prior era. UND prepares their students for the future, with the latest and greatest airline-type avionics. With the NOAA Corps, this is definitely back-to-basics flying. With the P-3 and Twin Otters, I do a lot of dynamic maneuvering. It is a lot of fun!”

When he is not hunting hurricanes, Mitchell is still flying. “NOAA has nine different aircraft for different types of research,” explained Mitchell.

The DHC-6-300 Twin Otter is used in marine research, tracking whales and dolphins for population assessments. This information can help in maintaining healthy oceans and other needs.

Last September he spent a month in California, searching for endangered leatherback sea turtles. Flying a Twin Otter at 600 feet, he would look for turtles, circle them, and vector a boat onto the turtles so researchers could take samples and attach satellite tags on them. Coastal mapping is another project

the NOAA Corps works on. Mitchell and others collect data along all the coastlines of the United States and that information goes into creating marine charts for boaters.

At times Mitchell even makes a return to the northern plains. NOAA Corps does snow surveys over North Dakota, South Dakota and Minnesota. Flying 500 feet over the snowpack, they use a gamma radiation detector that can detect the background radiation from the earth and determine the liquid water content of the snow. This information is important in determining the spring flood forecast, including the Red River.

“In the NOAA Corps you are an officer first and a pilot second,” said Mitchell. “We help the scientists coordinate how best to collect their science based on the capabilities of the plane and the limitations of regulations. It really requires a good understanding of science in addition to knowing aviation. The advice I would give to current and future students would be to get a good understanding of math and science, alongside the flying.”

—Jena Pierce

Left: A NOAA DHC-6-300 Twin Otter, used in marine research

Right: One of two Lockheed WP-3D Orion “Hurricane Hunters” in the NOAA fleet

RAINMAKER

David Delene is a cloud tinkerer.

He's a rainmaker, a hail stopper and a drought's worst nightmare rolled into one. His research provides a better understanding of Mother Nature for the benefit of society.

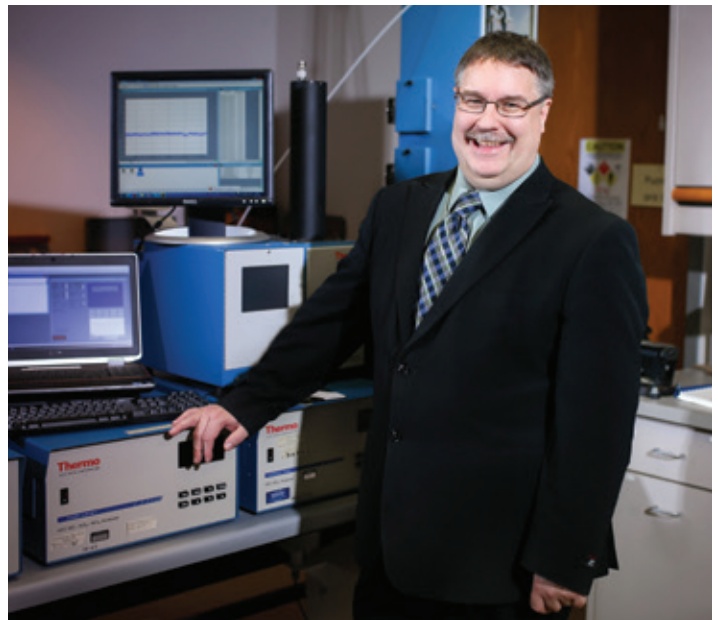
To augment his research, Delene, a UND atmospheric scientist, was recently awarded funding from North Dakota's Centers of Excellence Commission (COE) to improve understanding of how precipitation develops in clouds. His work could lead to more effective cloud-seeding applications to reduce hail, enhance rain and conduct snow augmentation in parts of the world that need it.

Delene will use the COE funding to partner with Fargo-based Weather Modification International (WMI) and Ice Crystal Engineering (ICE) of Kindred, N.D., private-sector leaders in weather modification and pyrotechnic cloud-seeding research, respectively, to evaluate ice nuclei produced by ground generators and cloud-seeding flares.

Ultimately, the project is expected to gauge the effectiveness of seeding flares produced by ICE and possibly facilitate development of new products in the future. The companies will tap into Delene's years of research and expertise on clouds and their precipitation processes in hopes of more effectively getting the right amount of rain to the right spots and reducing the likelihood of hazardous hail events altogether.

"This is a good project that we're conducting," Delene said. "It has really good theoretical and practical aspects to it."

The project will investigate how ice nuclei, produced by current methods, impact micro-structures inside of clouds. Ice nuclei are used to catalyze the formation of ice particles in clouds. The National Science Foundation's "Pi (π) Cloud Chamber" at Michigan Technological University in Houghton, where Delene received his undergraduate and master's degrees, will be used



for the actual evaluation experiments.

UND's Department of Atmospheric Sciences has a strong track record of working with private industry on research projects. UND has sold its Cessna Citation II weather research aircraft to WMI and has expanded worldwide research partnerships with that company. The new partnerships would involve educational opportunities for students.

Delene described clouds as factories for producing snow or rain. "We can't do anything if the factory is not there," he said. The benefits of their work could be enormous for a number of industries, from agriculture to tourism and recreation.

Droughts are often caused by low mountain snowpacks in the winter, Delene explained. Increasing rain amounts would help crops thrive, and the enhancement of snowfall in higher elevations produces greater snowpacks that will, in turn, provide life-giving water runoff in the spring and summer in lower elevations.

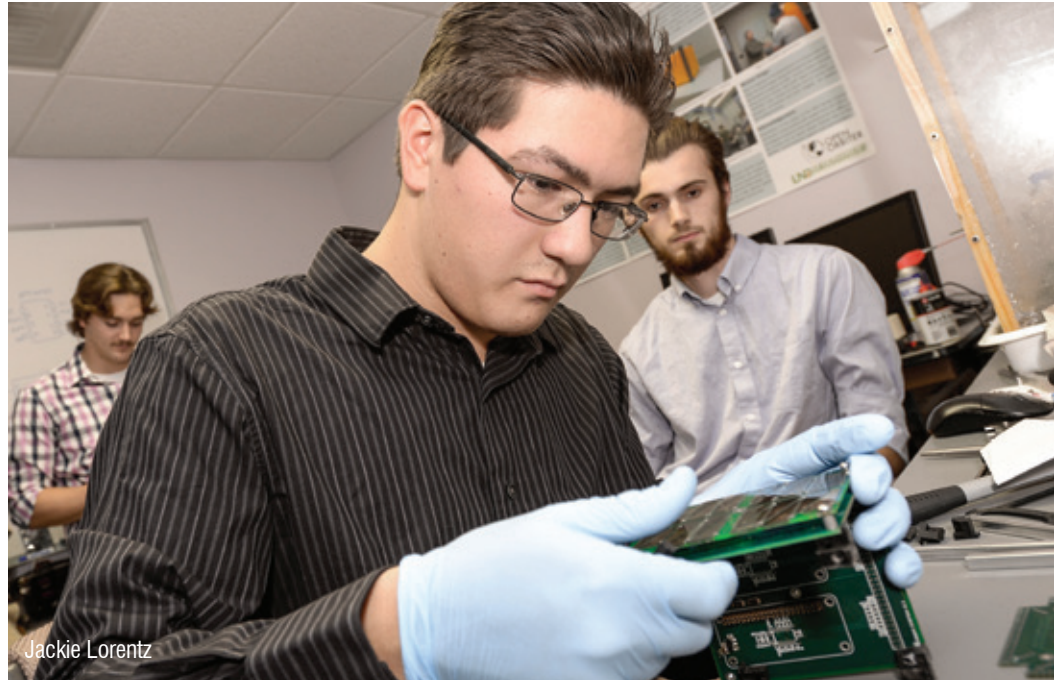
More snow could also create a stronger bottom line for ski resorts and other water recreation businesses.

In addition to helping the private-sector companies improve their product lines, the research will provide opportunities to address other fundamental questions about cloud processes, Delene said.

—David Dodds

FIRST IN FLIGHT

UND and NDSU students collaborate on what would be North Dakota's pioneer free-flying satellite



UND Mechanical Engineering student Michael Hirsch tests the capabilities of a CubeSat, or miniature satellite, that he and other UND students built. The CubeSat is scheduled to carry an even smaller 3-D printer into space when it orbits the Earth early next year. The project aims to test the effectiveness of 3-D printing in ultra-cold, zero-gravity environments.

Teams at UND and NDSU are designing their own versions of a satellite that will soon carry a research payload into orbit. Though they're working on separate satellites, they have a common goal: to build the best miniature orbiter possible.

Ultimately, the top-performing components from each university's version will be combined into a final product. That version will be launched into space and stored on the International Space Station (ISS) until it's released into orbit, according to Jeremy Straub, coordinator of the satellite project.

The satellite, or "CubeSat," as it's called (because of its cube shape and minute dimensions—less than 11 inches on a side), will be the first North Dakota-built satellite to be launched into orbit. It's only fitting, then, that it's being

developed by students from two of the state's biggest research universities.

Straub personifies the collaboration taking place at UND and NDSU. His work with CubeSats started at UND, having recently received his Ph.D. in computer sciences there. He is currently a faculty member in NDSU's Computer Science and Operations Research division.

Because of size constraints and other scientific challenges, the UND and NDSU students have been forced to be innovative and creative with their approaches. They've also tapped into cross-disciplinary sources of support at their respective campuses to tackle various questions.

"The project has always been very student-centered and student-led at both schools," Straub said. "So what

will happen is that if the students need a particular resource, they will simply go and seek out what they need. At various points at UND, there have been people from every college involved with the project."

Straub estimates that between the two universities, upwards of 90 students have had some involvement with the project.

Karl Schmaltz, a UND electrical engineering student from Stillwater, Minn., ensures that all of the CubeSat components are functioning, powered correctly and communicating with each other. He says it beats sitting in a classroom.

"This is complete hands-on work," Schmaltz said. "We're learning everything by ourselves, with the help of others when we need it, and we're

learning to meet strict deadlines and to communicate with the other teams at NDSU, which is another big deal.”

For Skye Leake, a native North Dakotan from Emerado, the significance of students from UND and NDSU—two traditional rivals since the early days of statehood—working together is not lost on him.

“That doesn’t always work the best (in many other cases),” said Leake, with a smile. “That’s not to say that I don’t have some good friends from NDSU. But there is definitely some well-intentioned ribbing that goes on with this project. Through it all, though, everyone has been really cooperative.”

Leake, a UND mechanical engineering student, focuses on the satellite’s physical structures and its ability to safely carry its scientific payload into space and eventually into orbit.

“Our satellite is not necessarily the most technologically advanced thing to go up in space,” he said, “but it’s certainly a stepping stone for this institution. There are longer term plans for bigger and better; the long term is where it really starts getting interesting.”

Leake is referring to the potential for the research payload aboard the North Dakota CubeSat: a tiny, specially modified 3D printer (roughly 5 x 5 x 8 cm). There is already a 3D printer aboard the ISS, but it’s in a relatively warm and comfy zero-gravity setting. If all goes right, the orbiting CubeSat will provide the ultimate laboratory to conduct basic scientific studies on how a 3D printer copes with the vacuum, low pressure and harsh cold of a micro-gravity environment.

“Getting all three at the same time on Earth would be very difficult,” Straub

said. “This gives us the opportunity to test all of the different factors at one time.”

The benefit of 3D printers is that they let space travelers transport smaller, lighter and less expensive raw materials that can be used later to build critical tools and other assets in remote environments where resources are scarce.

Straub said that a lot of coordination needs to take place before NASA finally makes the call on when North Dakota’s CubeSat might launch. He’s expecting that call to come sometime in early 2017. When it does go up, it’s slated to launch from Wallops Island off the Virginia coast.

—*David Dodds*

COMPUTER SCIENCE ACCREDITATION

The Computer Science undergraduate program recently had its accreditation renewed by the Computing Accrediation Commission (CAC) of ABET, a major nonprofit, nongovernmental accrediting body recognized by the Council for Higher Education Accreditation (CHEA). The visit found that “no deficiencies, weakness, or concerns were found,” which is quite uncommon.

Dean Paul Lindseth and Computer Science Chair Ron Marsh want to recognize the department’s faculty, especially Associate Professor Tom O’Neil, for their efforts in securing the reaccreditation.

The department was first accredited in 1987 and will remain accredited through 2022.

INTRODUCING DR. SEAN HAMMOND



Last fall the ESSP department welcomed a new faculty member, Dr. Sean T. Hammond. Originally trained as a molecular biologist, Dr. Hammond considers himself a modeler and a macroecologist—a field that studies the

relationships between organisms and their environment at large geographic scales and over long periods of time. Accurate forecasting of how organisms, including humans, will interact with their surroundings is critical for ecologists and policymakers examining Earth-system topics, particularly when considering how to optimize the human use of natural resources. To accomplish this, Dr. Hammond relies on a number of models, many of which he created.

Dr. Hammond studied with the notable allometrist and evolutionary biologist, Karl Niklas, at Cornell University. There, he combined his extensive training in molecular biology with computer models he created to accurately simulate forest growth over hundreds of years.

While modeling forests, Dr. Hammond observed emergent patterns in how individual trees compete for space and light, and how their structures often resemble the infrastructure built by people to transport goods. These insights into basic rules about how complex systems function have allowed him to expand his research and work with people investigating transportation networks, efficient infrastructure and food security. His forest modeling and human system work has been featured in notable journals such as *BioScience*, *Botany*, and the *Proceedings of the National Academy of Science*.

Dr. Hammond currently teaches courses related to biodiversity, modeling of forest and human systems, and the history of transgenic foods.

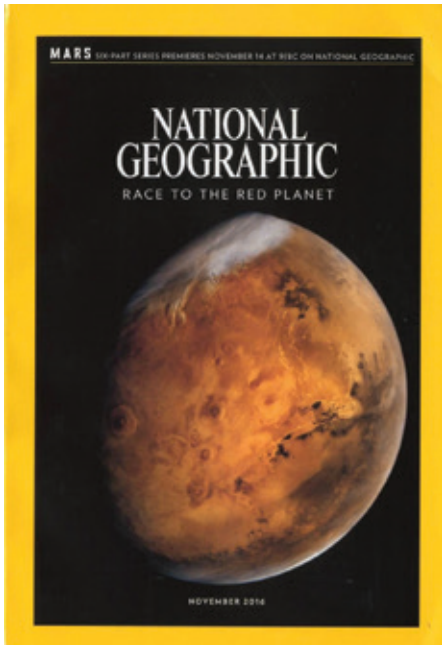
—*Soizik Lagnette*

AEROSTOP



UNDaerospace.com | 7:30-4:30 | 123 Robin Hall

OUT OF THIS WORLD



National Geographic Magazine, November 2016 issue.

UND's own Pablo de León is reaching new heights in publicity with his expertise in interplanetary travel and what to wear when you're doing it.

De León, an associate professor in the Department of Space Studies, was a featured guest at the Smithsonian Air and Space Museum in Washington D.C., where he presented and answered questions about the latest version of his NDX-1 spacesuit, which was designed and constructed at UND.

De León was invited as part of the Smithsonian Latino Center's ¡Descubra! Meet the Science Expert series in connection with Hispanic Heritage Month: Innovators in Aviation and Space Heritage Family Day at the world-famous museum.

"It was a very interesting day for me and certainly a lot of fun to be part of," de León said.



Professor Pablo de León tests the NDX-1 space suit in the "regolith bin" at NASA's Kennedy Space Center. © Phillip Toledano/National Geographic

De León was also featured in the November 2016 edition of National Geographic magazine. The issue is titled "Race to the Red Planet." The issue's cover story, Mars: Inside the High-Risk, High-Stakes Race to the Red Planet – If the trip doesn't kill you, living there might, includes a centerspread photo of de León testing his space suit prototype in the "regolith bin" at NASA's Kennedy Space Center in Florida. The chamber's fine soil and fans simulate the dust storms that could bedevil astronauts on Mars.

A native of Argentina, de León has been with UND for 12 years, first as a research associate and starting in 2013 as associate professor. He holds degrees in aerospace engineering and a Ph.D. in the history of science and technology. He's the project manager of UND's NDX-1 Space Suit Program, a moon-suit version called the NDX-2 Lunar Suit Prototype, as well as UND's Inflatable Lunar/Mars Habitat, which would allow space travelers to live and work for extended periods on the moon and Mars.

De León is also director of the Human Spaceflight Laboratory at UND, and he is the chief scientist for a NASA grant program that will study the possibility of a "Multi-Purpose Research Station in North Dakota in Support of NASA's Future Human Missions to Mars."

—David Dodds

HUMAN SPACEFLIGHT LABORATORY

Since 2004, dozens of dedicated students, faculty and industry experts have worked to incorporate a human spaceflight component into the Space Studies department. The department is now home to the Human Spaceflight Laboratory, located in Clifford Hall on the Grand Forks, N.D. campus. This is one of the few universities in the world to offer human spaceflight related courses.

The main focus of research is the design and production of space suit and habitat prototypes. UND is the first university with a NASA-funded laboratory dedicated to designing and constructing space exploration and planetary surface exploration suits.

The North Dakota eXperimental 1 (NDX-1) space suit was developed under a NASA grant at UND. It is a Mars suit prototype, and was developed as a surface suit for planetary exploration. It has been extensively tested by NASA in a variety of environments, including Antarctica and desert regions of Australia. The NDX-1 is one of the most successful suits developed at the Human Spaceflight Laboratory and was recently featured in a special Mars exploration edition of National Geographic Magazine.

—*Pablo De León*



AEROSPACE ALUMNI ADVISORY BOARD UPDATE



Hello from the UND Aerospace Alumni Advisory Board (AAAB)! We hope all of you had a wonderful holiday season.

First, we would like to congratulate Beth Bjerke on being named associate dean of the John D. Odegard School of Aerospace Sciences and Jim Higgins on being named Aviation Department chair. Both are excellent selections and will continue to lead the Odegard School well into the future.

The AAAB had a great visit and fall meeting at UND in October. The AAAB Executive Committee and faculty met on a variety of topics including the concept of bringing an Aviation Safety Action Program (ASAP) to UND Aerospace. The faculty and the AAAB will work with the FAA to determine the feasibility of bringing the program to campus. A huge “thank you” to all of the AAAB members who came in early to help conduct the mock interviews with students who will be graduating soon. Your time and advice to the students will greatly help them as they begin their careers. Also, much thanks to Beth Bjerke and Josh Christianson for arranging the visit and always making us feel welcome. The AAAB greatly appreciates the work you put into the board.

The Board also had the opportunity to visit current students in the Aviation Living Learning Community residence hall. It is a great opportunity for us to meet our future industry leaders and for the students to ask our thoughts on a variety of issues. We also use these annual get-togethers to give the students an opportunity to give us feedback on the program, which helps us to identify issues that we as the AAAB can help with.

The fall business meeting of the AAAB had a very full agenda. Attendance both in person and via phone was tremendous. We had briefings on industry hiring trends and increasing starting pay rates, just to name a few. The faculty updated the Board on current UND Aerospace programs, research projects, enrollment, accreditation, the new training fleet and the commercial program review. We also had the opportunity to tour the newly opened Robin Hall. This incredible new facility gives UND Aerospace some much needed space to expand and continues to keep them at the forefront of UAS education and training.

The spring meeting will bring us back to campus to coincide with the 2017 Student Aviation Management Association (SAMA) Conference. Look for an announcement in the next month on meeting logistics. We are excited to combine the meeting with the SAMA conference as it will help to bring more alumni to the spring meeting.

As always, “thank you” from the entire AAAB for the opportunity to serve the students, faculty and alumni of UND Aerospace.

Thank you again,
Corey



Corey Stephens '99
President, AAAB
corey.o.stephens@gmail.com

Operations Research Analyst, FAA

Corey Stephens **99**
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Anderson, Tina **05**
Annis, Jay **98**
Baas, Bradley **86**
Baker, Rich **00**
Barnes, David **01**
Blumhorst, Jonathan **11**
Boxrucker, Craig **00**
Castor, Jimmy **03**
Coleman, Doug **84**
Cooper, Chris **05**
DuVernay, Jason **06**
Ems, Michelle **05**
Geisler, Robert **86**
Gillen, Michael **92**
Gora, Brian **83**
Hall, Eric **90**
Hansmann, Glen **89**
Hauge, Tom **92**
Hedrick, Robert **82**
Heining, Joel **92**
Hess, Erich **00**
Hopper, Josh **03**
Huff, Matt **03**
Jensen, Kurt **79**
Kappenman, Jeff **83**
Klinger, John **90**
Klueker, John **01**
Knesek, Daniel **97**
Kuhlman, Steve **89**
Lasky, Todd **02**
Laventure, Andrew **10**
Leon, Steve **90**
Leonard, Tim **87**
Lounsbury, Tom **82**
Lukasezck, Bryan **92**
Manki, Derek **03**
Martin, Roger **73**
Miller, Andrew **93**
Muhs, Bob **77**
Muhs, Jack **87**
Nelson, John **90**
Nemec, Joe **01**
Odegard, John **89**
Olson, Erin **05**
Schermerhorn, Rob **86**
Schofield, Jodi **91**
Schroeder, Brian **98**
Secrist, Brad **99**
Shields, Josh **00**
Stimpson, Justin **01**
Stork, Richard **04**
Strack, Brian **01**
Stubbe, Joseph **02**
Swing, Jeff **96**
Tomlin, Nicholas **94**
Toivola, Kevin **01**
Troxel, Brad **06**
Webster, Doug **83**
Wright, Corey **05**

UPCOMING EVENTS

International Women in Aviation Conference | March 2-4
Orlando, FL

UND Aviation Alumni & Industry Reception | March 2, 7-9PM
Disney's Coronado Springs Resort
Orlando, FL

SAMA Career Fair | April 20-21
Grand Forks, ND

UND Aviation Family Weekend |
April 22-23
Grand Forks, ND

EAA Airventure | July 24-30
Oshkosh, WI

UND Aerospace Alumni & Industry Reception | July 26
Oshkosh, WI

UND Homecoming | October 2-7
Grand Forks, ND



UND Students talk with industry professionals at the 2016 SAMA Career Fair.



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ND meteorologist Leon Osborne, as associate professor and director of the Severe Weather Analysis Center at UND, sits in the Regional Weather Information Center.

ARCHIVES

