Alaska Space Grant News

Newsletter of the Alaska Space Grant Program • Fall 2013

Promoting Earth and Space Science and technology and other NASA relevant teaching, research, and public service throughout Alaska.

Space Grant Funds Bring Sophisticated Fish Disease Course to Alaska Pacific University

by Ana Nelson Shaw

As a fisheries ecologist at Alaska Pacific University, Brad Harris kept track of increasing evidence in the scientific record that human impacts on ocean conditions were affecting how diseases and parasites manifested in fish populations. After a 2010 USGS study showed a notably high incidence of the parasite *Ichthyophonus hoferi* in Cook Inlet halibut, Harris began to work on ways to advance knowledge about fish epidemiology in Alaska while also offering inquiry-based learning opportunities for students. That effort culminated in the offering of Marine Epidemiology, an intensive field course for upper-division and graduate students supported by Alaska Space Grant funds.

Brad Harris

"Many larger institutions have excellent fish disease and parasitology courses," Harris said, "but it's uncommon to find them at small, private schools."

Four students took advantage of the unusual opportunity at APU and enrolled in Marine Epidemiology beginning in August 2012. The data obtained there have been used in one undergraduate thesis by Brad Tyler and one Master's thesis by Caitlin Grenier, who served as the teaching assistant for the course. Tyler now works at the USGS Fish Disease Lab in Marrowstone, Washington. Grenier is continuing her Master's studies. Another student, Charlayna Cammarata, now studies sea turtle virology in pursuit of a Ph.D. at Texas A&M University. Student impacts and support were primary objectives for the project.

The Marine Epidemiology course also made a difference beyond the four students who took the course. At an open house presenting results for the general public, 70 visitors learned about the incidence of *I. hoferi* in halibut.

Harris leveraged Space Grant funding to obtain other grants and donations to support the course from entities like the At-Sea Processors Association. Altogether he gathered enough support to obtain needed equipment, hire student assistants, and bring in outside experts like Jayde Ferguson and Barbi Failor from the Alaska Department of Fish and Game and Jacob Gregg from the USGS. Strengthening relationships with those organizations ended up as another important result of the project, Harris noted.

The educational impacts of the course will continue to be felt. The course itself may be offered again at APU, and its materials will be funneled into the curriculum in five other courses regularly offered: Survey of Marine Biology, Fisheries Ecology, Icthyology, and Invertebrate Zoology. With those future applications, there are virtually no limits to how this year's Space Grant funding may make a difference to the study of marine diseases and parasites at APU in the future.

NASA/Alaska Space Grant Program

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UAF photo by Todd Paris

From the Director

Denise Thorsen

Sequestration was not a word I was familiar with a year ago. Over the past year we have felt the impact of the word. A year ago, on the threat of sequestration, NASA choose to forward fund certain Space Grant jurisdictions rather that provide an Augmentation opportunity as they had in the past. We were one of the jurisdictions that were forward funded. However, the lack of an Augmentation opportunity meant that our expected 2012 budget was reduced by approximately $180,000. The impact of this reduction was that fewer students were offered a NASA summer experience and fewer projects were funded.

Seems like every year we have changes in our personnel. This year was no different. I would like to welcome two new affiliate representatives. The new representative at the University of Alaska Anchorage (UAA) is Sam Siewert, and the Challenger Learning Center of Alaska is now represented by Chantelle Rose. I would also like to welcome two new members of our Board of Directors. Kathe Rich has succeeded Greg Walker as the Range Manager of the Poker Flat Research Range and UAA is now represented by Tien-Chien Jen, Dean of the School of Engineering.

The 2013 Annual Education and Research Symposium was held on the Alaska Pacific University campus. At that meeting we heard updates from all of our funded projects and students. I always learn something interesting at these meetings. This year I learned that hibernating mammals can be used as analogs for humans in space for research in bone density loss and studying diseases in fish can inform us about the health of our oceans. I also learned how the act of freezing water in a waterfall releases heat that warms up the surrounding ice allowing water to continue to flow. This year we had our first ever Lunabotics Team. We would like to thank Brice Company for donating the BP-1 material used as a substitute for lunar regolith (i.e. moon dust!). The creation of our own Lunar Test Facility at Dr. Lawler's house was instrumental at getting our team prepared for Kennedy's Space Center's Fourth Annual Lunabotics Mining Competition. You will find stories on these and more projects in this newsletter.

Update on our satellite mission is that we have finally been manifested! The Alaska Research CubeSat (ARC) will be delivered in May 2014 for launch in December of that year. The team is working very hard to make sure we have a flight unit ready to go.

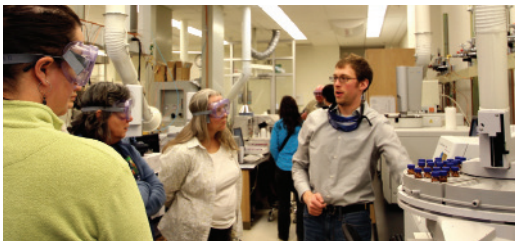
Precollege Education

"Macro to Micro" Events Offer Educators and Students New STEM Perspectives

by Ana Nelson Shaw

Most people would consider themselves lucky to find one great passion in life. Holly McQuinn, an EPSCOR coordinator at UAA, has a few: she's a science communicator, a mom, and a visual artist. With help from the Alaska Space Grant Program, she combined those passions with contributions from scientists and educators to help boost K-12 STEM education in Alaska.

In a series of three "Macro to Micro" STEM education events coordinated by McQuinn, nineteen Anchorage-area teachers and 190 students not only learned about university-level research in STEM fields, they got their hands on the science and got images to take back with them to their schools.



"When they learned about scanning electron microscopes, they really made the connections between research, hands-on experience, and visual records of the science," McQuinn said. "It was pretty cool."

McQuinn made sure the day offered age-appropriate lessons for the student participants and their teachers. For example, researchers from UAA's Applied Science, Engineering, and Technology (ASET) lab hosted three sessions with different age groups, from mid-grade elementary students through high school. The Geomatics lab conducted their demonstration using an old-school approach that turned out to be perfect for all ages, using transparencies that students could literally stack on top of each other to learn about layers in digital maps.

"The lecture hall was full," McQuinn recalled. "You could see kids playing with maps, talking about technologies."

The three sessions in March and April 2013 included a watershed sciences field trip and a planetarium show along with lecture and lab experiences for teachers and students. Response to the field trip was particularly strong; so many teachers wanted to bring their students that the program ran out of space.

"We overcame this as much as possible as a result of the Planetarium generously donating extra time and adding additional shows so we could fit more students into the overall program," McQuinn said. "We also scheduled the day to accommodate for capacity in different rooms."

Continued on page 4

Alaskan Ground Squirrels May Offer Clues About Keeping Bones Strong in Space

by Ana Nelson Shaw

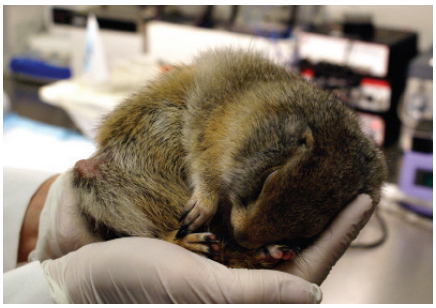
Humans in space and hibernating mammals both face long periods of muscle disuse, which that can lead to loss of bone density. Biochemists at the University of Alaska Fairbanks, observed a clue about how those periods of disuse might be different.

"Hibernating Alaskan ground squirrels maintain bone strength despite long periods of disuse and decreased metabolism," said postdoctoral researcher Lori Bogren.

In their Space Grant-funded study, Bogren and others in Professor Kelly Drew's Arctic Biology lab at UAF compared how different conditions of disuse affected changes in bone density.

"Better understanding of the relationship between skeletal load, metabolism and energy homeostasis and bone density may lead to therapeutics or strategies to maintain bone density in space," Bogren explained.

The researchers, including Drew, Bogren and a few undergraduate assistants, had to work carefully to determine appropriate ways to immobilize a hind limb for Alaskan ground squirrels. Suspending the animals' tails as is sometimes done for other research animals wasn't feasible, because the ground squirrels' tails are smaller and more delicate. They ended up using a procedure called sciatic neurectomy, severing a nerve to make one limb unusable.



Erin Johnston

Responsible, humane practices are always required in research on animal subjects.

"The animals were carefully monitored to insure that they were adjusting well to the immobilization and did not have any adverse reactions," Bogren said. "No problems ended up resulting from the neurectomy."

Student assistant Erin Johnston said, "Not only did I get to take part of a truly interesting study, but I got to use tools and techniques that usually only pre-med or pre-vet students are privy to."

Johnston hopes to go on to pursue related research in graduate school.

Results from the research have not yet been released. If the ground squirrels show natural protection against bone loss, even when during a non-hibernating, forced period of disuse, biologists will undertake more research to determine why and how. When the current study is complete, they will travel to Houston, Tex., to share results with project collaborator Adrian LeBlanc at Universities Space Research Association (USRA).

In the meantime, Bogren and her team have enjoyed learning about the unusual talents of their animal subjects.

"It is remarkable how arctic ground squirrels reduce their metabolic demand and sustain a low body temperature, a barely discernible heartbeat, and barely discernible breathing," Bogren said. "They also go months without eating. Then they can reverse all of that, unscathed, and resume a normal activity level during the summer."

A Frozen Alaskan Waterfall Helps a Geophysicist Prepare for an Antarctic Research Adventure

by Meghan Murphy

Most climbers just scratch the surface of frozen Dragonfly Falls with their ice axes, but Erin Pettit isn't just an ice-climber. She's a University of Alaska Fairbanks geophysicist who delves underneath the surface of glacial and waterfall ice to see how it forms, evolves, and responds to climate change.

This past winter Pettit and a team of undergraduate and graduate students studied the popular ice-climbing waterfall near Healy during its cycle of freezing and thawing. A time-lapse camera took a picture of the waterfall every 30 minutes. The team regularly visited the waterfall to collect data and film the waterfall with a heat-sensitive camera that captures warm water flow on top of the ice even when it isn't visible to the naked eye.

"Waterfall ice goes through an amazing evolution every season, at a much faster pace than glacier ice," Pettit said. "You can see it over multiple winters and watch how the water responds to the seasonal snowfall and temperatures that we experience."

Funding from the Alaska Space Grant Program made the study possible, which revealed that Dragonfly Falls first freezes early in the winter as icicles grow and merge to create a large ice mass. Then a thin stream of water flows down the ice surface slowly thickening the frozen waterfall over the remainder of the winter.

Although people associate freezing with cold, the act of freezing releases heat that warms up the surrounding ice. Pettit and her crew found some ice that was at O degrees Celcius even on a –40 Celcius degree day.

While Pettit wanted to gain knowledge from the study, she also wanted to practice certain research techniques before using them in a much larger endeavor in Antarctica.

"We're taking what we learn here about the waterfall ice evolution, and we're going to be applying this knowledge to studying the water movement underneath and through glaciers down in the Antarctic."

Continued on page 4

UAS Geoscience Field Studies

by Cathy Connor

While the Alaska Space Grant Program (ASGP) is dedicated to broadening our understanding of space, it is also dedicated to bettering our understanding of Alaska. As part of the programs continual investment in the Last Frontier, ASGP awarded funding to several earth sciences-based research projects throughout the state.

One project is support for students participating in an 8-week, summer, glacier and climate science field course through the Juneau Icefield Research Program (JIRP). Students learn about glaciology, atmospheric science, and landscape evolution through field camp lectures, glacier traverses, and mass balance data collection to help maintain the 60 year record for the Taku Glacier. Students also gain expedition science skills and learn essential safety skills for conducting research in this cold and wet temperate glacier environment. This year five students received Alaska Space Grant support to help defray the program's $4000 field fee that supplies the students with food, faculty, and equipment.

The program also provides participants with the opportunity to each carry out their own research project as part of their course requirements. Many of the world's foremost climate scientists are alumni of this program. Over the 8 weeks students travel across numerous Juneau Icefield glaciers, including the Ptarmigan, Lemon Creek, Taku and Llewellyn Glaciers. All of the glaciers were located between Juneau, Alaska and Atlin, British Columbia.

ASGP also supplied additional funding for five UAS undergraduates and two faculty members to travel for 4 days from Juneau by ferry and van throughout the southern Yukon in a combined Geology and Anthropology course. Students compared information about past climate from the glacial geomorphology and Eastern Beringian sediments with oral histories from indigenous Tlingit and Champagne-Aisiak people who have lived in this region for millennia. These coastal and interior human cultures coped well with late Pleistocene to Little Ice Age climate change and traded important resources across the Continental Divide

Both programs were funded because of their important role in NASA's continued interest in studying climate variability at the global level. Current research is focused on providing information about oceans and the cryosphere, and their interactions with the entire earth system. Information from a NASA Earth Science Data Center (located at the Alaska Satellite Facility at UAF) has already provided invaluable information for previous JIRP studies.

Jeff Kavanaugh

Macro to Micro from page 2

Along with help from Andrew Puckett and other Planetarium staff, McQuinn relied on several other important contributors to support the Macro to Micro project. Recent UAA grad Drew Cason worked as McQuinn's assistant. Michelle Krok and Alison 'Sunny' Mall presented and assisted with coordination and evaluations. Dr. Thad Woodard, an Anchorage pediatrician and radio host, inspired and encouraged the project from the beginning and presented information for the teachers and students. Other presenters filled out the day, including Professor Caroline Wilson, a UAA neurobiologist who contributed significant time and expertise. The project also relied on help from recently retired Anchorage School District STEM Coordinator Michael Fenster, who helped connect with teachers and assisted with the continuing education process.

Fenster's help was vital because the events served as a continuing education course through the UAA College of Education. Participating teachers developed lesson plans based on their experiences, then implemented those plans back in their own classrooms, spreading their expanded knowledge beyond just the students who attended Macro to Micro themselves.

Frozen Waterfall from page 3

Pettit said she is intrigued by an Antarctic feature called Blood Falls, which is a red outflow of salt water that emerges on the surface of Taylor Glacier and cascades down its terminus. The iron oxide in the water stains it red.

Explorers first saw and recorded Blood Falls on the Taylor Glacier in 1911. What's amazing, said Pettit, is that the plume of red water always seems to emerge at the same spot even thought glaciers, by nature, are always changing. Scientists think the water comes from a subglacial pool of ancient seawater that became trapped and sealed off from the outside world millions of years ago.

Little is known about Blood Falls' origin, how long it has been sealed below Taylor Glacier or the mechanisms that control its episodic release to the surface, but Pettit aims to find out.

She will go to Antarctica during this coming austral summer to collect data and set up temperature gauges and camera equipment to monitor Blood Falls and track its evolution during the winter.

Higher Education

Kennedy Space Center's Fourth Annual Lunabotics Mining Competition

by Diana Campbell

Add some Barbie and G.I. Joe Jeep wheel parts, steel tubing, 3-D printer-manufactured adaptations, Red Green Regatta float pieces, leftover computer codes along with the brains and imagination of University of Alaska Fairbanks students and faculty, and you have…

A remote controlled Lunabot ready to take on international competition in a mock lunar mining competition.

"We build nothing but the best," said Orion Lawler, a UAF associate professor of computer science, from his Fox home where the team built and tested their Lunabot.

This May a UAF team went to NASA's Kennedy Space Center for the Fourth Annual Lunabotics Mining Competition. The rules of the competition required teams to design and build a remote controlled or autonomous robot excavator that could maneuver in and on regolith—gritty moon sand—dig it up and then deposit it into a bin within 10 minutes. The team was also required to submit engineering and outreach papers.

It was the team's first time to the NASA completion and while they did not win any awards, they are proud their robot was able to move and mine regolith and dump it when many others failed. About 50 teams, from the U.S. and overseas, entered the competition.

"We're going back and win," said Aven Bross, 19, and a UAF computer science major.

The group, made up of 20 students, including one local Fairbanks high student, spent about six hours a week at Lawler's shop in Fox, built on old gold mining tailings. Orion and Robert Parsons, an educational specialist with UAF's Alaska Space Grant Program, helped the team build a garage-in-a-box kit on top of two award-winning Red Green regatta raft decks to use as the Luna Test Facility, or LTF as they called it. Inside are many pick-up truckloads of BP-1, donated by Brice Company. BP-1 is a fine, gritty dust-like material that mimics the regolith samples that Apollo 17 brought back from the moon.

When driving in the dust-like material, a robot kicks up a heavy veil of dust and it is hard for machinery to operate in and on.

The group said the Luna Test Facility was key in helping the young developers fine-tune their machine. It takes a lot of thought on how to make the robot have traction, float over the surface, scoop, carry and dump the load.

"It made a difference," Parson said.

Noah Bentzen, 20 and also a UAF computer science major, noted that over half of the robots in the NASA competition couldn't move in the competition arena, much less mine.

Most of the team members come from a robotics background, and are studying computer science, mechanical engineering, electrical engineering and mining.

Fellowship & Scholarship Recipients

Fellowship Recipients

Matthew Balazs (AY12 – 13)
Geology, Graduate
University of Alaska Fairbanks

Russell Carroll* (AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Wolfram Donat (AY12 – 13)
Computer Systems Engineering
University of Alaska Anchorage

Sean Egan (AY12 – 13)
Environmental Chemistry, Graduate
University of Alaska Fairbanks

Jesse Frey (AY12 – 13)
Electrical Engineering, Graduate
University of Alaska Fairbanks

Kimberly Giroux (AY12 – 13)
Outdoor & Environmental Education
Alaska Pacific University

Logan Graves (AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Tiffany Green (AY12 – 13)
Geoscience
University of Alaska Fairbanks

Kayla Harrison* (AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Joseph Hunner* (Summer '12)
Mechanical Engineering
University of Alaska Fairbanks

Marcus Jackson (Summer '12)
Mechanical Engineering
University of Alaska Anchorage

Morgan Johnson* (Summer '12, AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Erin Johnston (AY12 – 13)
Biological Sciences
University of Alaska Fairbanks

Jon Klein (AY12 – 13)
Electrical Engineering, Graduate
University of Alaska Fairbanks

Chic O'Dell* (AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Cyrena Parker (AY12 – 13)
Chemistry
University of Alaska Fairbanks

Jamie Pierce (AY12 – 13)
Environmental Science
University of Alaska Southeast

Jeffery Randall (AY12 – 13)
Environmental Science, Graduate
Alaska Pacific University

Margaret Raughley (Summer '12)
Physics
University of Alaska Fairbanks

Eyal Saiet (AY12 – 13, Summer '12)
Chemistry
University of Alaska Fairbanks

Thomas Sielicki (AY12 – 13)
Electrical Engineering, Graduate
University of Alaska Fairbanks

Caleb Smith* (Summer '12)
Mechanical Engineering
University of Alaska Fairbanks

Jacquelyn Smith (AY12 – 13)
Geological Engineering, Graduate
University of Alaska Fairbanks

Joseph Stribrny (Summer '12)
Electrical Engineering
University of Alaska Fairbanks

Samuel Vanderwaal (AY12 – 13)
Electrical Engineering, Graduate
University of Alaska Fairbanks

Patrick Wade* (Summer '12, AY12 – 13)
Mechanical Engineering
University of Alaska Fairbanks

Scholarship Recipients

Clay Allen (AY12 – 13)
Mechanical Engineering
University of Alaska Fairbanks

Stefanie Armstrong (AY12 – 13)
Civil Engineering
University of Alaska Anchorage

Daniel Bross (AY12 – 13)
Computer Science
University of Alaska Fairbanks

Kaelin Ellis (AY12 – 13)
Mechanical Engineering
University of Alaska Anchorage

Zachary Krehlik (AY12 – 13)
Electrical Engineering
University of Alaska Fairbanks

Cameron Kuhle (AY12 – 13)
Environmental Science
University of Alaska Anchorage

Mary Miller (AY12 – 13)
Pre-Engineering
University of Alaska Southeast

Janine Ray (AY12 – 13)
Natural Sciences
University of Alaska Anchorage

Sydney Rosenbalm (AY12 – 13)
Physics
University of Alaska Fairbanks

Stefan Weingarth (AY12 – 13)
Petroleum Engineering
University of Alaska Fairbanks

**Students sponsored by Alaska Aerospace Corporation*

Student Highlights

Marcus Jackson of the University of Alaska Anchorage

by Jeremia Schrock

During the summer of 2012, students from the University of Alaska participated in an internship at the National Aeronautics and Space Administration (NASA). One of those students was Marcus Jackson, an athlete and engineering student at UAA. Jackson spent his summer break at the Goddard Space Flight Center in Maryland.

For as long as he could remember, Jackson had been fascinated by space. The internship at NASA was the perfect opportunity for him to further explore that passion. "When you think of space, you think of NASA," Jackson said.

One of the more unique aspects of his internship was his appreciation for the process each NASA project undergoes. While attending monthly project status updates at the center, Jackson saw first-hand how space projects develop. "I saw how science, engineering, and business each have an important impact on a project's success," he said. "This allowed me to have a greater appreciation for the complexities and diversity of the work related to spaceflight," he said.

Jackson added that seeing the development of numerous scientific projects got him thinking about how what he learned in college could impact his future career. He was fortunate enough to be invited to a Maryland Space Business luncheon, while gave him the opportunity to expand his professional contacts in the field.

Back at the center, Jackson learned about NASA's testing and design standards which not only expanded his engineering vocabulary, but helped him appreciate the problems inherent to launching anything into space. "All this renewed my enthusiasm for my studies," Jackson said.

While he used to attend class in order to eke out a decent grade, that's all changed since returning from the internship. "Now I am motivated to really immerse myself in my engineering studies and I have sought out additional opportunities outside of the classroom to expand my knowledge and skills," he said.

"I have realized that with the same focus and dedication with which I have pursued basketball excellence, spending extra hours training and constantly striving to improve, I must now also channel into becoming an engineer," Jackson added.

What's the biggest lesson he learned working for NASA? "I really do not 'know everything' and I have a lot to learn," he said. "I am more motivated going back to school so I can dive into my studies," he added.

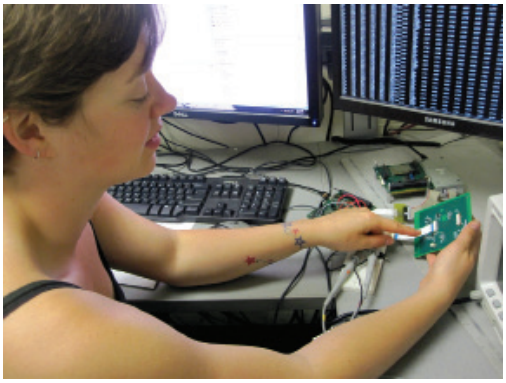
"This summer at NASA was an invaluable learning and growing experience," Jackson said. "I had a great time working there and I know looking back, it will be an important milestone in my life."

Morgan Johnson of the University of Alaska Fairbanks

by Amy Hartley

Morgan Johnson distinguished herself at a 10-week NASA internship by forging her own project that could organize and analyze telemetry data for a PhoneSat model.

The University of Alaska Fairbanks Electrical Engineering major began working on a model with a dozen peers in the summer of 2012, but then created her own niche on the project. At NASA Ames Research Center, Johnson developed a MATLAB code that could take telemetry from a PhoneSat and break it out into various charts for analysis. This work grew from her experience creating subsystems, such as a launch environment data logger, for the Alaska Research CubeSat project based at UAF.



Sitting at a small table in the Wood Campus Center during a break between spring classes, Johnson explained how the environment created inside a CubeSat during its launch and orbit is a mystery. Engineers don't know just how hot the sensors will get or how much vibration they can endure. Morgan's subsystems will monitor onboard sensors such as gyroscopes and the health of the CubeSat's electrical power system. They will package up the crucial data and send it back to Earth.

Work on such projects provide valuable lessons for the UAF junior who hopes to one day pursue a career that assists a better understanding of outer space.

"I like building satellites. I think it would be cool to help build one that went into deep space," Johnson said. "I would like to learn more about what's out there."

During her time at Ames, Johnson was particularly taken with a presentation a NASA scientist provided on the Kepler spacecraft, which searches for habitable Earth-like planets in the Milky Way galaxy.

"It would be really awesome to be a part of a project that would identify planets that do contain life. It would be fantastic!"

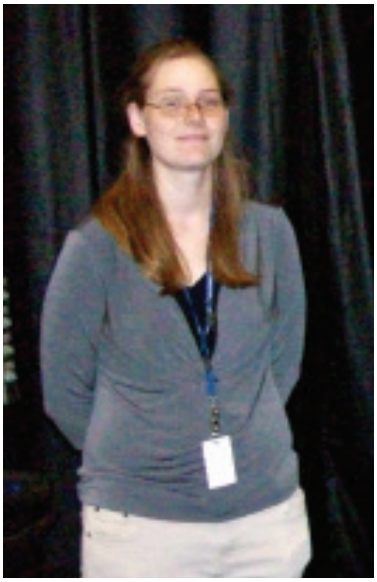
Johnson is on track to graduate in spring 2014. Due to her experience with the Alaska Research CubeSat project, the Alaska Space Grant Program and the proximity to family in the Goldstream Valley, she hopes to pursue graduate school at UAF.

Margaret Raughley of the University of Alaska Fairbanks

by Amy Hartley

In spring 2012, Margaret Raughley learned that she earned a slot in a competitive National Aeronautics and Space Administration internship program to take place at NASA Marshall Space Flight Center in Huntsville, Ala. From late May through early August of that year, the University of Alaska Fairbanks Physics major would work with a NASA mentor and a small team on ARMS, short for "Automated Robotic Manipulator System."

"Getting accepted and knowing they picked you out of hundreds of applicants is a big deal," Raughley said by phone. "I was stunned!"



The ARMS prototype is a hefty set of mechanical arms, made of aluminum and designed to grasp and manipulate objects. These ARMS can be connected to a vehicle, launched and then used to make repairs to damaged satellites or equipment residing in space. ARMS' movements would be directed from an operator possibly stationed hundreds of miles away. No easy feat.

A motor failure and the sheer enormity of creating a robotic system that can turn, bend and pinch could have been overwhelming, but Raughley and her two colleagues persisted. Without the ability to test ARMS in a space environment, the team focused their attention on practicing arm motions. Eventually, the team added a trio of cameras to the apparatus, so an operator could manipulate the arms based on what they saw through the cameras' lenses. This addition allowed Raughley's team to simulate the experience of controlling the system from afar.

"I think we made excellent strides. I'm really happy that we got it working, Raughley said. "There's so much that could go wrong."

Raughley's internship ended before ARMS was complete, but a new batch of undergraduates will pick up where her team left off. There's no telling how the prototype can be refined in the future. In just two months, Raughley's team was able to grow the project tremendously, beginning with little more than a pair of robotic hands left them by a group of previous employees.

Margaret Raughley graduated with her Bachelor of Science degree from UAF in spring 2013. She plans to return to her native Pennsylvania and enroll in graduate school.

Eyal Saiet of the University of Alaska Fairbanks

by Amy Hartley

Dominic Hart © NASA Ames

Eyal Saiet already has a pair of NASA opportunities on his resume even though he just graduated with a Bachelor of Science from the University of Alaska Fairbanks.

The young scientist first earned an internship at NASA Ames Research Center in Mountain View, California in summer 2012. There, he worked with a team of chemistry students to develop material that would be used for solar cells. This summer, Saiet is working to equip unmanned aircraft with a gas sensor as part of a NASA fellowship.

Saiet traveled from Israel to attend UAF several years ago. He began studying biology and then switched to chemistry, in which he just earned his bachelor's degree. However, chemistry isn't Saiet's end-all be-all. He's assisted glaciology research using RADAR, studied arctic sea ice, examined local air quality and has a personal interest in monitoring the aurora, which he can see quite often from his home off Yankovich Road just north of campus.

"He's really motivated and really excited about learning about the Arctic," said Bill Simpson, a professor of chemistry at UAF. "[Saiet] delves into a problem and tries to figure out the whole problem and what he can do about it."

Saiet says he enjoys monitoring the environment. "If it's glaciers or birds — it's all great," he said.

The NASA Ames experience was instrumental in Saiet's trajectory; it helped him realize he wanted to continue his education, just not in chemistry. His interests were more in tune with geophysics and remote sensing.

"That internship was a turning point, sending me in a different direction."

Saiet's new NASA fellowship research is a reflection of that transformation. In 2013, he joined researchers and technicians with the Alaska Center for Unmanned Aircraft Systems Integration, based at Poker Flat Research Range. There, he's developing a methane sensor that will be connected to one of the aircraft in the center's fleet. The goal is for the aircraft sensor to sniff out traces of methane along Alaska pipelines. If there's a strong methane signal, there could be a compromised area of pipe. This project can help mitigate the potential for a leak or spill along a line.

"Anyone in science would say an experience with NASA is great. You can't top it," Eyal Saiet said.

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Calendar of Events 2014

JANUARY

- NASA Summer Internships through SOLAR due

MARCH

- Spring National Space Grant Directors Meeting in Washington DC
- ASGP project proposals due
- Graduate Research Fellowships due

APRIL

- Alaska Space Grant Symposium in Juneau, Alaska April 24 – 25, 2014.

SEPTEMBER

- Undergraduate Fellowship/Scholarship applications due

OCTOBER

- Fall Western Region Space Grant Directors Meeting in Boulder, CO

The fourth annual

Education and Research Symposium

will take place in
Juneau, Alaska
April 24 – 25, 2014