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Dear Friends,

Earlier this year, Senior Research Scientist Peter Neuhaus received word that IHMC and four other organizations from around the world had been selected as finalists in the Mobility Unlimited Challenge, a competition organized by the Toyota Mobility Foundation. It is a significant achievement for Peter and his team to be selected as one of the five finalists. IHMC's entry in the challenge is our powered exoskeleton, a device that provides paraplegics with increased mobility and independence. More about the Mobility Unlimited Challenge and IHMC's exoskeleton can be found on page 3.

Earlier this year, it was announced that I and 14 other people from the nation's technology, defense and academic sectors have been tapped for the newly formed National Security Commission on Artificial Intelligence. The commission reports to the President and Congress and is being asked to investigate and understand how global AI developments might affect national security. More about the appointment and the commission can be found on page 6.

This edition of the newsletter also highlights a new Ph.D. program in Intelligent Systems and Robotics that IHMC is offering in partnership with the University of West Florida. For more on the PhD program, please see page 7.

IHMC is also partnering with the City of Pensacola Police Department to develop a comprehensive police drone program. These specialized drones will be used in law-enforcement operations such as search and rescue, disaster response, fugitive evasion and monitoring of outdoor events and festivals. More about the drone program is on page 8.

Thank you to all who continue to be loyal followers of our podcast STEM-Talk -- conversations with some of the most interesting people in the world of science and technology. We are excited about soon releasing STEM-Talk Episode 100, a true milestone as we near 2 million listeners.

Finally, my good friend and longtime associate Alberto Cañas recently announced his retirement. Alberto and I along with the late Dr. Bruce Dunn founded IHMC back in the early 1990s. As you will read in a story on page 10, even though Alberto is stepping away from his day-to-day duties, he still plans to continue his research into concept mapping and to give lectures. IHMC would not have happened without Alberto. He will be greatly missed.

Best wishes,

Ken Ford

Ken Ford

International Mobility Unlimited Challenge names IHMC a finalist for $1 million prize

Back in 2016 when Peter Neuhaus and his IHMC colleagues showed up at the first international Cybathlon in Zurich, they didn't expect much.

Neuhaus and the 10-member IHMC team just wanted to see how their exoskeleton stacked up against the other 66 teams from 25 countries. The competition was designed for people with disabilities who are supported by modern assistive technologies.

No one was more surprised than Neuhaus when the IHMC team walked away with the Silver Medal in the powered exoskeleton race.

"That's when I first realized we were really onto something," said Neuhaus. "On the flight back to Pensacola, I remember thinking, "Now what?"

Three years later, Peter got his answer.

IHMC recently became one of five teams from around the world to receive a $500,000 grant as part of a $4-million program sponsored by the Toyota Mobility Foundation. The grant will allow Neuhaus and his colleagues to further the development of their exoskeleton prototype.

Last year, Toyota in partnership with Nesta's Challenge Prize Centre, announced the Mobility Unlimited Challenge, a global competition that solicited game-changing technologies geared toward improving the lives of millions of people with spinal-cord injuries and lower-limb paralysis. Nesta is a UK charity that uses the challenge of prizes to stimulate innovation.

At the news conference in Las Vegas where the five finalists were announced, media outlets from around the world covered the event and produced more than 120 stories.

"For us to be one of the five finalists is incredible," said Neuhaus. "Getting funding to do this kind of work has been extraordinarily hard. We're constantly struggling against people saying that the market for this kind of technology is too small. That's why the work that Toyota is doing is so important. It's really going to help get this technology to the people who need it."

Each of the five finalists has received $500,000 to develop their prototypes. The final stage of the challenge will be held in Tokyo in 2020 where the winner will receive $1 million.

"These five finalists have shown real innovation driven by human-centered design," said Ryan Klem, director of programs for the Toyota Mobility Foundation. "We think that the technology incorporated in these devices could change the lives of a huge number of people around the world, not just for people with lower-limb paralysis, but also those people who have a wider range of mobility needs."

IHMC team members gather to review next steps for the Mobility Unlimited Challenge

The five finalists are from the United States, Japan, Italy and the United Kingdom. Their devices range from a lightweight, mobile exoskeleton on wheels to a wearable leg sleeve that helps people with partial lower limb paralysis regain their mobility to an AI manual wheelchair made from carbon-fiber.

IHMC's device is called QUIX. It's a robotic-powered exoskeleton with motors at the hips, knees and ankles as well as additional actuators that offer someone with lower-limb paralysis fast, stable and agile upright mobility. Neuhaus says the device stands out because it provides people with mobility and independence that current exoskeletons cannot.

Mark Daniel, a paraplegic who grew up in Pensacola, has been working with Neuhaus and IHMC on the exoskeleton since 2010. Daniel says the benefits the exoskeleton provides a paraplegic are significant. From a health perspective, being able to walk on his own helps Daniel with his cardio, bowel and bladder function. It also improves his bone density and helps decrease body fat.

But the biggest benefit, says Daniel, is more emotional.

"Most of the time a paraplegic is sitting in a wheelchair looking up at people," he said. "I cannot tell you how much it means to be able to stand up on your own and look someone in the eye."

IHMC's partner for the Mobility Unlimited Challenge is Gainesville-based Myolyn, a medical device manufacturer specializing in exercise cycles for people with neurological issues. Myolyn's role is to help with the commercialization of IHMC's exoskeleton.

Matt Bellman, chief technical officer of Myolyn, worked with Neuhaus as an intern at IHMC from 2010 to 2012.

"I've known Peter for a long time and he knows more about exoskeletons than anybody," said Bellman. "We are thrilled to be part of the project and to one day make QUIX available to all who need it."

The prototype of the exoskeleton that Neuhaus and his team will present in Tokyo will be very close to what Bellman believes will eventually become commercially available.

"It's Peter's job and IHMC's job to create something that will make a difference in people's lives," said Bellman. "Our job at Myolyn is to be the bridge that gets the exoskeleton out of the lab and into the hands of the people who will benefit from it. We are committed to being part of this amazing project for the long haul."

"Current mobility devices are often unable to fully meet the needs of users due to limitations affecting functionality and usability," said Charlotte Macken of Nesta. "Historically, the pace of innovation is slow, due to small and fragmented markets and difficulties in getting new technology funded by health-care systems and insurers. This can make the field unattractive to the very people who could help change the world."

Although there are no statistics on paralysis worldwide, the World Health Organization estimates there are 250,000 to 500,000 new cases globally of spinal cord injuries. The most common causes of lower-limb paralysis are strokes, spinal-cord injuries and multiple sclerosis.

Once people are confined to a wheelchair, they face barriers that not only limit their mobility, but also their independence and livelihoods as well as their human potential. QUIX has the potential to replace the wheelchair.

"I am convinced the technology behind QUIX has the potential to dramatically improve the lives of millions of people with lower-limb paralysis," said Neuhaus. "When I met Mark Daniel nine years ago, he had just become paralyzed as the result of an automobile accident. He had been a welder who was making good money until that accident."

Daniel has become Neuhaus' go-to-guy for testing the various prototypes of the exoskeleton, including QUIX. Daniel

Julieta Cruz is one of several summer interns working with Neuhaus and the exoskeleton team

was the athlete who helped IHMC take home the silver medal at the Cybathlon in 2016.

"Mark told me one day that if exoskeletons had already existed when he had his accident back in 2010, he would still be a welder today," said Neuhaus. "If the technology we're working on had been there, Mark said he wouldn't have had to give up his livelihood. That's why this work is so important."

The Mobility Unlimited Challenge aims to stimulate the kind of innovation that will make new products available for people like Daniel and others with spinal-cord injuries. A key goal of the challenge is to help the finalists with the commercial development of their devices.

Neuhaus, a graduate of MIT who received his doctorate from the University of California Berkeley, has been working on wearable robotic devices that will help and benefit paraplegics and other people with lower-limb paralysis for nearly 15 years. He has been working on the current prototype of IHMC's exoskeleton for the past eight years.

In preparation for the final judging in 2020, Neuhaus and his team will be:

- Designing and building the next prototype exoskeleton, which will feature more actuators and sensing than the previous versions.
- Developing control algorithms that will provide balance assistance and terrain-conforming capabilities.
- Designing new user interfaces to enable the pilot to more easily control the device.

"It's a lot of work," said Neuhaus. "We especially have a lot of engineering challenges to deal with. And then there's the challenges on the business-development side of things. How do we work with Matt and Myolyn to make our exoskeleton commercially available and ensure that it gets to the people who need it the most, people like Mark? That's what's really important."

Neuhaus watches as Daniels is fitted with an exoskeleton brace

Daniels is put through a series of physiologic tests

At the Cybathlon, Daniels used the exoskeleton to tour Zurich.

Congress appoints Ford to National Security Commission on AI

Dr. Ken Ford and fourteen other top people from the nation's technology and defense sectors have 22 months to figure out where artificial intelligence is headed.

The newly formed National Security Commission on Artificial Intelligence has been created to especially investigate and understand how global AI developments might affect national security. Former Google CEO and current chairman of the Defense Innovation Board Eric Schmidt has been tapped to chair the independent federal commission that is being asked by Congress and the White House to:

- Evaluate the competitiveness of the U.S. in artificial intelligence.
- Consider the risks of military uses of AI by the U.S. and other countries.
- Review foreign developments and investments in AI as well as related machine-learning advancements and associated technologies.
- Create a strategy to encourage investment in AI research and AI workforce development.
- Raise ethical considerations that need to be addressed in the use of AI.

Last summer, the White House identified leadership in AI as its second highest research-and-development priority second only to national security. President Trump became the first U.S. president to name artificial intelligence as an administration R&D priority.

The National Defense Authorization Act for the fiscal year 2019 establishes the 15-member group as an independent branch of the federal commission. The group has up to $10 million in funding and is charged with producing reports for the President and Congress with recommendations for "action by the executive branch and Congress related to artificial intelligence, machine learning, and associated technologies."

The commission's findings and recommendations, including annual reports that are due in August of 2019 and 2020, have been fast-tracked.

"I am quite honored to be part of this group," said Ford. "As we all know, it has become critically important for us as a nation to understand the implications of AI, especially in terms of national security. I hope that this commission will be able to identify the challenges and opportunities associated with this still evolving technology."

U.S. Senator Marco Rubio said Ford's credentials and career made him an excellent choice for the commission.

"America faces incredible challenges as technological advances upend our communities, disrupt our workplaces and threaten our national security," said Rubio. "For nearly three decades, Dr. Ford has been at the forefront of understanding these changes and how they impact our nation and the world. His appointment to the National Security Commission on Artificial Intelligence is well-deserved, and helps give me confidence that our nation has the ability to adapt, thrive and prosper for generations to come."

In addition to the White House, the Pentagon has also made artificial intelligence a top priority. In its 2018 National Defense Strategy report, the Pentagon described AI as a technology that will change the character of war and give increasingly sophisticated capabilities to our adversaries.

The commission is just one piece of the Pentagon and the federal government's increasing focus on artificial intelligence. DARPA announced $2 billion in funding last year for research investigating "third wave" AI technologies.

Ford during a photoshoot for the cover of Florida Trend

IHMC and UWF team up for Florida's first Ph.D. program in intelligent systems and robotics

Ph.D. students play a critical role in the research world.

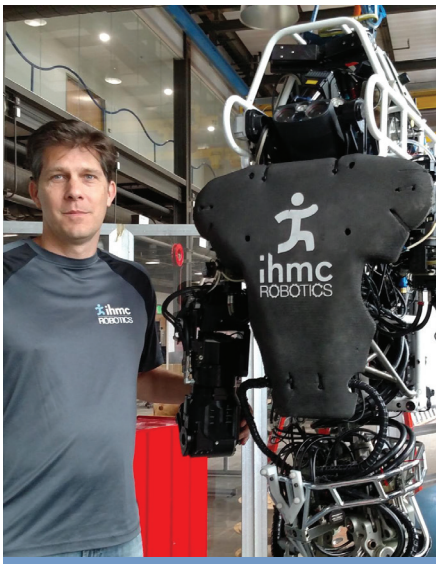
That's why IHMC's Dr. Jerry Pratt is looking forward to the new Ph.D. program in Intelligent Systems and Robotics that IHMC and UWF will be offering in the fall.

"This is a one-of-a-kind program that's going to attract people to work on a Ph.D. whose research will be directly related to the projects we have going on here at IHMC," said Pratt, a senior research scientist who leads the institute's robotics team.

The new Ph.D. in Intelligent Systems and Robotics is the first of its kind in Florida. There are only three other universities nationwide with similar robotics programs: Carnegie Mellon, University of Pittsburgh and the Georgia Institute of Technology.

"We've been thinking about something like this for quite a long time, but it's only in the last two or three years that the momentum really picked up," said Dr. Ken Ford, IHMC's co-founder and CEO. "As everyone is probably aware, intelligent systems, particularly AI systems, are of increasing importance and are generally misconstrued. This is a broad program, ranging all the way from human cognition research to AI to robotics. So, it will be very much personalized to each individual Ph.D. student. It's not a one size fits all."

According to a 2012 study by the National Robotics Initiative, robotics technology holds the potential to transform the future of the U.S. and is expected to become as ubiquitous over the next decades as computer technology is today. The demand for doctorates in fields related to intelligent systems shows no signs of letting up in the technology, defense and academic sectors.



Johnson has been IHMC's point person

"This program is definitely a game changer. We are creating a program that will bring together the strengths of the UWF engineering and computer-science programs with the expertise of a world-class research center like IHMC," said UWF President Martha Saunders.

The Intelligent Systems and Robotics doctorate will be an applied research degree with a dissertation component. The curriculum will emphasize research rather than coursework.

Typically, the first two years of a doctoral program are spent taking courses and then figuring out a research topic and finding an advisor. But that's not what students will be doing in this program.

Matt Johnson, a research scientist at IHMC who is serving as the institute's representative on the committee that is developing and overseeing the Ph.D. program, says the program is based on a European-style model and will be more similar to the kinds of doctorates you see at Oxford and Cambridge where the emphasis is on research.

"On day one, students will need to come in with a clear idea of a research area and be ready to pair themselves with a faculty mentor at IHMC or UWF," said Johnson. "This is very much a hands-on program. Most classes will be independent study and will be individualized for each person. Students won't be sitting around in a classroom listening to lectures. They'll be working on projects and doing actual research."

"It's really going to be a unique program in the U.S.," added Ford.

UWF is planning to hire six to eight tenure-track faculty members over the next five years. The university also is renovating a laboratory that is adjacent to the IHMC Pensacola campus.

"I think one of the most exciting aspects of the program is that students will get to go directly to work in the labs of IHMC researchers," said Saunders. "They won't have to sit around in a classroom for two years listening to lectures before they get to actually work on their research."

Not only is the Ph.D. program a first of its kind throughout Florida, but it's also a first of its kind for UWF. The university has had an education doctorate program for years, known as an Ed.D, but never a Ph.D. program.

UWF and IHMC are in the process of jointly hiring an experienced program director. The program is now accepting students who will begin working on their Ph.D. in the fall semester.

Ford says the students who decide to enter the Intelligent Systems and Robotics program and earn their Ph.D. will have a wealth of career options.

"It's very hard to hire someone with a Ph.D. in a field related to AI or robotics," he said. "Silicon Valley snaps them all up pretty aggressively. So, these students will have lots of options from academia to industry to government."

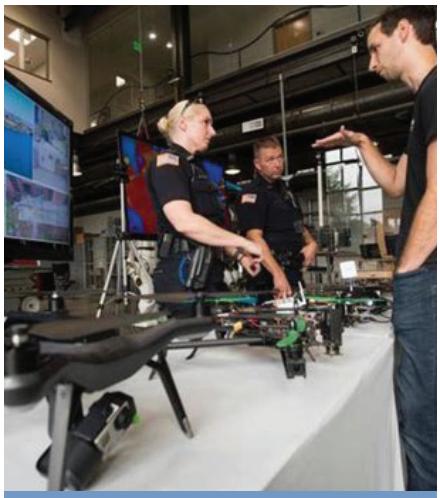
IHMC partners with local police on drone program

IHMC and the City of Pensacola Police Department have partnered to develop a new comprehensive police drone program.

The program will incorporate specialized drones in police operations such as search and rescue, disaster response, fugitive evasion, threat situations as well as monitoring outdoor events and festivals.

"Most people know about our work with robots and NASA and the various branches of the military" said Ken Ford, IHMC CEO. "But this is a great example of how the research and expertise of our scientists is being used for the benefit of our local communities."

The Pensacola Police Department will be equipped with two indoor and two outdoor drones with infrared capabilities that will be particularly helpful to locate suspects. While off-the-shelf drones are available to law-enforcement agencies, many are not appropriate for critical government services such as police operations. Most drones also are unable to handle missions that operate in or around buildings.



Prototypes of the drones

"I spent many years on the SWAT team," said PPD Chief Tommi Lyter. "Right now, if you have a barricaded suspect, the only way to clear a building is to suit up and send six officers into an incredibly dangerous situation with an armed suspect. Whereas now, we will be able to put a drone in a building and clear an entire building and hopefully locate the suspect and even have a conversation with them in real-time."

IHMC has been developing technology for years that is well-suited to provide customized drones that can be effective tools for law enforcement needs. IHMC and the Pensacola Police Department also will work together to develop a training program to educate officers on the use of these specialized drones.

Kernagis wins Outstanding Young Scientist Award

IHMC Research Scientist Dawn Kernagis is the 2018 recipient of the annual Young Scientist/Medical Doctor Award that is presented by the Undersea and Hyperbaric Medical Society.

Dawn Kernagis

The award recognizes the work of a young scientist whose performance is consistently outstanding.

"I am beyond grateful for this award," said Kernagis. "I have been blessed to be surrounded by inspirational colleagues and advisers while transitioning from being a full-time diver to a researcher. This is such an unexpected surprise."

Kernagis, who was inducted into the Women Divers Hall of Fame in 2016, spent her early career as a diver and leader of underwater explorations around the world. She spent more than a decade with a team of divers exploring Wakulla Springs and its deep-water caves. She also was selected in 2016 to become one of six crew members for NASA's undersea mission, NEEMO 21.

Kernagis came to IHMC after completing her doctorate and post-doctoral training at Duke University. Her research at IHMC is focused on identifying ways to optimize performance and resilience for humans working in extreme environments. Kernagis is also the co-host of IHMC's award-winning podcast, STEM-Talk.

She is currently leading several projects for the Office of Naval Research investigating human performance and resilience in the undersea environment. She is also leading a study funded by the NASA Translational Institute on how the brain lymphatic system responds to simulated microgravity.

The Undersea and Hyperbaric Medical Society is an organization based in the U.S. which supports research on matters of hyperbaric medicine and physiology.

Levin Center wins AIA People's Choice Award

The American Institute of Architects and the Florida Foundation for Architecture recognized the Levin Center for IHMC Research as the winner of its fifth annual People's Choice Competition.

Built in 2016, the 30,000 sq.ft. Levin Center was designed by the Pensacola firm Quina Grundhoefer Architects.

The expansive first-floor space of the research center includes a two-story-tall robotics and exoskeleton laboratory. The second floor has a glass-walled observation corridor that overlooks the robotics lab and offers visitors a place to watch scientists and their robotics staff at work. The second and third floors feature conference rooms, offices, lab space and a boardroom. On top of the three-story facility is a rooftop deck that overlooks Pensacola Bay and the downtown business and historical districts.

A $1 million donation to IHMC from Pensacola attorney Fred Levin helped the institute complete the facility and its robotics lab.

"As architects, we, of course, like it when our peers evaluate our work and recognize us," said Carter Quina, who was the lead architect on the project. "But to have your design receive recognition from everyday people is even more special. If people love what we've designed, then we've done our job. This is really a great honor for us and Pensacola."

A total of 39 buildings were nominated for the People's Choice award with submissions from across the state. Other top vote-getters included the Tampa Riverwalk, Care Point Health and Wellness Center in Tallahassee, and the Kate Tiedemann College of Business located in St. Petersburg.

Levin Center opened in 2016

IHMC named Ocala's most innovative company

Ocala Style magazine identified IHMC as the most innovative and important company to locate in Ocala in the past 20 years.

"In 2010, IHMC brought a whole new industry to Ocala, opening their doors to the community and inviting us in to explore new, cutting-edge ideas and theories," wrote the magazine in describing some of the criteria it used in selecting IHMC. The magazine went on to praise the institute for its community service, especially IHMC's ongoing Science Saturday workshops that encourage elementary and middle school students to pursue STEM education.


A Science Saturday class in Ocala

"We are really honored to be recognized like this," said Ken Ford, IHMC's co-founder and CEO. "Ocala and the surrounding area have been wonderful about welcoming us to the community. We especially love our downtown location and hope to be part of the city for a long time."

The institute opened the Ocala branch research facility in a hexagonal, glass-paneled building on the town square that used to be the home of Marion County's main library. Built in the mid-1960s, the building stood out for the futuristic look it gave downtown. City and county grants as well as a federal economic development grant made it possible for IHMC to renovate and move into the facility in 2010.

Although IHMC's home base is in Pensacola, Ford and other Pensacola staff members make frequent trips to Ocala.

"It has been nice to not only see the progress we're making at our research facility in Ocala, but also to see the changes happening downtown," said Ford. "It's such a different and more vibrant community, than it was 20 years ago. Like I said earlier, we thoroughly enjoy being a part of Ocala."

Cmaps conference draws people from 22 countries

More than 100 people from 22 counties attended the 8th International Conference on Concept Mapping in Medellin, Colombia last fall.

Concept Mapping, also referred to as Cmaps, are graphic tools for organizing and representing knowledge in an organized fashion. The software that is used for Concept Mapping is the result of IHMC research.

"A lot of people who have attended the previous conferences said this one in Colombia was the best one they had ever attended," said Dr. Alberto Cañas, IHMC co-founder who leads the development of Cmap tools.

The three-day conference focused on the different types of uses for Cmaps.

"What made the conference so interesting is that a lot of the concepts that were proposed four to eight years ago are now showing up in organizations around the world," said Cañas.

Over the years, Colombia has particularly embraced Cmapping. In terms of downloads, more people from Colombia than any other country in the world visit IHMC's website to download the Cmap software.

"Colombia has done a good job of integrating Cmaps into classrooms," said Cañas. "I had the chance to visit some classrooms in really marginalized areas of the country where there has been a lot of conflict and gangs and drug trafficking in previous years. It was interesting to see how concept mapping has been established and used in schools there and how students are really into it."

The Conference on Concept Mapping was held in Medellin, Columbia

Alberto Cañas announces his retirement

IHMC co-founder Dr. Alberto Cañas announced his retirement earlier this year. Cañas along with IHMC director Dr. Ken Ford and the late Dr. Bruce Dunn founded the institute in the early 1990s while they were colleagues at the University of West Florida.

IHMC employees and guests gathered on the rooftop of the Levin Center to celebrate Cañas' lifelong commitment to science and innovation.

Much of Cañas' work at IHMC focused on CmapTools, the world's first concept mapping software. It was based on the conceptual education theories of IHMC Emeritus Scientist Joe Novak.

CmapTools software allows users to create graphical nodes representing concepts that can be connected using lines and linking words to form a network of interrelated propositions that represent a user's knowledge of a topic. The software has been used around the world in classrooms and research labs. Corporations and intelligence agencies also have utilized Cmaps.

Cañas also spearheaded the organization of Concept Mapping Conferences which annually are held around the world. The most recent Concept Mapping Conference was held in Columbia and drew people from 23 countries.

Cañas said he plans to remain a prominent figure in the conceptual-learning community and will continue to publish and lecture in his spare time.

Alberto Cañas

Hands-on Science Saturdays attracting more young students

More than 900 elementary school students in Escambia, Santa Rosa and Marion counties attended IHMC's Science Saturdays, a hands-on science program for children in the third, fourth and fifth grades.

"The program is really building momentum," said Ursula Schwuttke, the institute's director of educational outreach. "Parents and teachers have been great about helping us spread the word about Science Saturdays. Actually, even the kids have been great about spreading the word. They enjoy the program so much they've been encouraging their friends at school to check it out."

Students from more than 40 elementary schools showed up to participate in last school year's activities ranging from building roller coasters to designing computer games.

Last year for the first time, students in the sixth grade were invited to start attending Science Saturdays at IHMC's Pensacola and Ocala campuses.

Also last school year, teachers at several Marion County elementary and middle schools participated in robotics training that was hosted by IHMC scientists. As a result, several of the teachers were able to start after-school robotics clubs. In Pensacola, teachers from Workman Middle School attended a four-day robotics training program.

"The goal of our outreach program is to get as many kids as possible interested in STEM," said Schwuttke. "We not only want them taking STEM classes in high school, but also heading off to college to get degrees in STEM. I think educating our future scientists is one of the most important things we do at IHMC."

Science Saturdays feature hands-on experiments

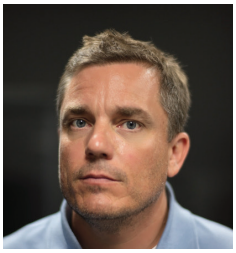
Science Saturdays

Science Saturdays is a hands-on science program for kids in third, fourth and fifth grade. High school students also volunteer at the sessions, which are held one Saturday a month during the school year.

Past topics include bottle rockets, chemistry, computer game design, secret codes, and roller coasters.

New team members at IHMC

Stephanie Tillery joins IHMC as associate general counsel. A former attorney for the City of Pensacola, she has spent most of her legal career practicing in the areas of contract and municipal law. At IHMC, she works closely with Executive Vice President and Chief Legal Counsel Julie Sheppard. Stephanie spent her undergraduate years at Florida State University where she received a bachelor's degree in international affairs and specialized in Chinese language and Asian studies. She spent two years as a language instructor at the Tonj Ji Medical University in the People's Republic of China before returning to the U.S. and earning a law degree from the University of Florida. In her spare time, Stephanie enjoys taking jiu-jitsu classes with her 11- and 8-year-old daughters.



Christon Dunahoo joins IHMC as building services coordinator. He works on a variety of internal and external projects related to IHMC's facilities and is responsible for maintaining all of the institute's buildings and grounds. In the 1990's, Christon founded Lost Key Communications, a telecommunications company based in Pensacola that installed and maintained fiber optic infrastructure across the Southeast and Midwest. In 2004, Christon became the ranch manager at the Clough Sheep Company in Colorado and oversaw day-to-day operations. He also managed the personal property of the company's owners. Christon also has a commercial pilot's license and over the years has been a commercial pilot, bush pilot and even done some crop dusting. In his spare time, Christon likes to build string instruments.

Ryan Tilley joins IHMC as the director of Strategic Program Execution and Innovation. Ryan works closely with Julie Sheppard to conduct near- and long-term strategic planning to include identifying funding opportunities; expand federal and state alliances; and oversee technology transfer and commercialization efforts. He previously served as the chief operating officer for VetCV Inc. as well as KontactIntelligence. His prior experience also includes significant experience in government contracting, working as program manager and senior consultant for H2 Performance Consulting. Ryan is a graduate of the University of West Florida where he majored in finance and global economics before earning a master's in business administration.

Michael McCullough joins IHMC as a research associate working with High Performance Director Joe Gomes. Mike is focused on applying advanced and novel methods to improve human performance. Prior to joining IHMC, Mike worked with Joe at the Oakland Raiders and applied up-to-date sport science to improve players' strength and conditioning. Mike earned a bachelor's degree in exercise physiology from Baylor University and a master's degree from East Tennessee State University in sport science. He served as ETSU's head strength and conditioning coach for the men's and women's track and field throwers as well as the women's basketball team. In his free time, Mike enjoys sports and reading about philosophy, anthropology and astronomy.

Dr. Greg Hall joins IHMC as a research scientist who specializes in cybersecurity. In addition to his work at IHMC, Greg also works with the Center for Cybersecurity at the University of West Florida and has held academic positions at the University of Idaho and Texas State University where he taught courses in software engineering and forensics. His experience in cyber defense and malware analysis while working for the Department of Defense and in the private sector have given him expertise in a full spectrum of cyber operations. He received his Ph.D. in computer science from the University of Idaho. His current interests include malware identification, intelligence-driven vulnerability analysis, Deep Learning applications in malware databases, and techniques for defeating binary diversity.

Olivia Jackson joins IHMC as a research associate working with Dr. Dawn Kernagis and a team of scientists focusing on the optimization of human performance as well as risk mitigation for individuals working in extreme conditions. She is a Pensacola native who graduated from Pensacola High School's International Bachelorette program before attending Florida State University where she conducted research in neuropharmacology, biomedical and neuroscience research. She graduated in 2017 with a major in psychology with minors in biology and chemistry. Olivia enjoys spending time outdoors with her dogs Sam and Bast as well as woodworking projects and playing music. She has been a figure skater since she was seven and recently started playing ice hockey.

RICHARD MCCULLOUGH

Dr. McCullough is the vice provost for research at Harvard University. Since 2012, he has overseen academic research across all of Harvard's schools and affiliated institutions. He also leads the new office of Foundation and Corporate Development at Harvard, and is a professor of Materials Science and Engineering at the university. McCullough's Pensacola lecture was titled, "A Look at Future Technologies That Will Change Your Life." He gave of overview of the dramatic scientific discoveries of the past 30 years before introducing some of the emerging technologies and discoveries that will have an impact on the future.

JACK BURNS

Dr. Burns is a professor in the Department of Astrophysical and Planetary Sciences at the University of Colorado Boulder as well as the vice president emeritus for Academic Affairs and Research. He is also the director of the Network for Exploration and Space Science, a $3.5 million center of excellence funded by the NASA Solar System Exploration Research Virtual Institute. His Pensacola lecture focused on the tools for space exploration. Titled "Our Future in Space: Humans, Robots and Telescopes Exploring Together," the talk looked at the future of human and robotic space exploration of the solar system and beyond.

STEVE ANTON

Dr. Anton is a professor in the Department of Aging and Geriatric Research as well as the Department of Clinical and Health Psychology at the University of Florida. His research is focused on the role that lifestyle factors have in influencing obesity, cardiovascular disease and metabolic disease conditions. He has particularly looked into the role that chronic low-grade systemic inflammation plays in sarcopenia. His Pensacola lecture, titled "Lifestyle Interventions to Preserve Function During Aging," provided an overview of promising lifestyle, therapeutic and other approaches that can help people avert chronic systemic inflammation and preserve cognitive and physical function as they age.

MICHAEL OKUN

Dr. Okun is an author, neurologist and researcher who is the chairman of Neurology and the co-director of the Fixel Center for Neurological Disease at the University of Florida College of Medicine. His research has been featured in the Smithsonian Magazine, National Geographic and on CNN. He is the national medical director for the Parikinson's Foundation. He has had a prolific research career exploring motor basal ganglia brain features and deep-brain stimulation. His Pensacola lecture focused on Parkionson's Disease and the latest advances in treatment and research. He also discussed his pioneering studies exploring the cognitive, behavioral, and mood effects of brain stimulation.

LILIANNE R. MUJICA-PARODI

Dr. Mujica-Parodi is the director of the Laboratory for Computational Neurodiagnostics at Stony Brook University School of Medicine as well as the Associate Neuroscientist and Lecturer in the Department of Radiology at Massachusetts General Hospital and Harvard Medical School. Her multi-disciplinary laboratory interfaces between the fields of physics, mathematics, engineering, psychiatry and neurology in developing cutting-edge neuroimaging tools to study brain-based disorders in humans. Her Pensacola lecture was titled, "Beyond Human Brain Mapping: Predicting Clinical Trajectories for Personalized Medicine. She discussed how new trends in neuroimaging are leading to personalized medicine with respect to brain-based disease.

NATALIE HOLT

Dr. Holt is a professor at Northern Arizona University whose research looks into the role of structural properties of muscle in determining performance under physiologically realistic and pathological conditions. She uses multi-scale physical properties of muscle in determining performance under physiologically realistic and pathological conditions. The title of her Pensacola lecture was "Skeletal Muscle: From Molecular Motors to Animal Movement." The talk emphasized how understanding the interaction between molecular motors and structural properties affects performance and how that is a major challenge in muscle physiology. She discussed how this process is essential to our ability to understand, predict and replicate animal movement.

EVAN KOVACS AND RICHIE KOHLER

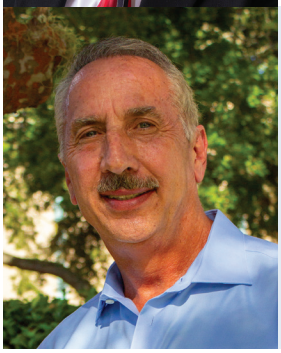
Richie Kohler is an author and explorer whose 40 years of diving experiences have taken him to all corners of the globe in search of shipwrecks. He was the host of the popular History Channel Program "Deep Sea Detectives." He has been the subject of documentaries and books detailing his deep-sea explorations of the Andrea Doria, RMS Titanic and the HMHS Britannic. Evan Kovacs is also a diver and explorer who is one of the few people to film in 2D and 3D the RMS Titanic and her sister ship HMHS Britannic. His underwater and topside films can be seen on National Geographic, History Channel, Discovery Channel, PBS, NOVA, and elsewhere. The two gave a Pensacola lecture that detailed their undersea explorations and their work filming and co-hosting "Deep Sea Detectives."

HARRISON "JACK" SCHMIDTT

Sen. Schmidtt is an American geologist, retired NASA astronaut, former U.S. senator from New Mexico and the most recent living person to have walked on the Moon. He also is the last living crew member of Apollo 17, the sixth and final human landing on the Moon. He served on President Reagan's Foreign Intelligence Advisory Board, the Army Science Board, and President H. W. Bush's Ethics Commission. From 2005 to 2008, he chaired the NASA Advisory Council. The title of his Pensacola lecture was "How to Return to the Moon and Go On to Mars." He talked about his desire to see a rebirth of human space exploration and the innovation that characterized NASA and the nation's space program during the Apollo years.

JERRY PRATT

Dr. Pratt is a senior research scientist at IHMC who leads the institute's robotics lab. His talk focused on how humanoid avatar robots are potentially well-suited for accessing hard to reach areas in hazardous environments while keeping humans out of harm's way. Pratt led an IHMC team to a second-place finish in the 2015 DARPA Robotics Challenge. Jerry earned his doctorate in mechanical engineering from M.I.T. and then helped co-found a small robotics company called Yobotics before moving to Pensacola. At IHMC, he leads a research group that concentrates on understanding and modeling the human gait and the ways that can be applied to robotics, human assistive devices and man-machine interfaces. Current projects include humanoid avatar robots for co-exploration of hazardous environments; FastRunner Robot, and exoskeletons.



RICK BAKER

Baker is the former mayor of St. Petersburg who gave IHMC lectures in Ocala and Pensacola on the rich history of Florida. Titled "Beyond the Sunshine: A Timeline of Florida's Past and Lessons for the Future," the talk focused on what Baker described as the lessons of Florida's history that should help communities throughout the state shape the decisions they are making today. From 2001 to 2010, he was mayor of St. Petersburg, Florida's fourth largest city. In 2008, he was named America's Mayor/Public Official of the Year by Governing Magazine and in 2011 was named "America's greatest mayor of the decade" by Newsweek Magazine's Daily Beast website. Baker is an adjunct fellow of the Manhattan Institute policy think-tank in New York City. He has authored three books: "Mangroves to Major League," "The Seamless City," and "Beyond the Sunshine," a timeline history of Florida.

STEPHEN CUNNANE

Nearly five million people in the United States today have Alzheimer's disease. In 30 years, the Alzheimer's Association predicts that number will swell to 16 million people. Dr. Cunnane ia Canadian physiologist whose extensive research into Alzheimer's disease is showing how ketones can be used as part of a prevention approach that helps delay or slow down the onset of Alzheimer's. His evening lecture, "Can Ketones Slow Down Alzheimer's," covered how keto-neurotherapeutic strategies for reducing the risk and progression of age-related cognitive decline and Alzheimer's disease can also help treat hypertension, type-2 diabetes and obesity. Cunnane has published more than 300 peer-reviewed research papers and five books, including "Survival of the Fattest: The Key to Human Brain Evolution" and "Human Brain Evolution: Influence of Fresh and Coastal Food Resources."

JOHN WELBOURN

Welbourn is a nine-year veteran of the NFL and CEO of Power Athlete, a company that provides strength and conditioning programs to help people achieve their athletic potential. Welbourn's lecture focused on "Athletic Performance and Strength Training for Aging Populations." Since retiring from the NFL in 2009, John has consulted and trained athletes in MLB, NHL, NFL, CrossFit and the Olympics. He has also worked in the same capacity for Naval Special Warfare, teaching performance and training for Navy SEALs. He works as a consultant for PowerDot, Form Lifting Collar, NeuroArmour and other fitness technologies to help to develop cutting edge training products for performance based athletes. John travels the world lecturing on performance and nutrition. He started for the Philadelphia Eagles from 1999-2003, appearing in three NFC Championship games.

WILLIAM DAVIS

Dr. Davis is a cardiologist and the author of the New York Times bestseller, "Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health." His evening lecture was titled "Germs, Muscle and Pac-Man: Exciting New Concepts in Youth Preservation and Anti-Aging." The talk focused on new research into the microbiome, the importance of muscle strength as we age, and how cognitive exercises can decrease the odds of Alzheimer's and dementia. Dr. Davis is a graduate of the St. Louis University School of Medicine, with training in internal medicine and cardiovascular disease at Ohio State University Hospitals, advanced training in angioplasty at the Case Western Reserve University Hospitals where he also served as Director of the Cardiovascular Fellowship and Assistant Professor of Medicine. He now focuses on preventive care and providing self-empowering strategies to the public.

JONATHAN CLARK

Dr. Clark is a Navy and NASA veteran who was a six-time Space Shuttle crew surgeon. He was part of a NASA team that investigated the Space Shuttle Columbia disaster in 2003. Columbia disintegrated upon reentering the Earth's atmosphere, killing all seven crew members, including Dr. Clark's wife, Laurel. His evening lecture was titled "Space Tourism: Commercial Potential in the New Space Era." The talk focused on how space tourism is the next frontier of human spaceflight. Dr. Clark devoted spent 26 years of active duty with the Navy. He headed the Spatial Orientation Systems Department at the Naval Aerospace Medical Research Laboratory in Pensacola. His career as a Space Shuttle crew surgeon was part of an eight-year tenure at NASA, where he was also chief of the Medical Operations Branch and an FAA senior aviation medical examiner for the NASA Johnson Space Center Flight Medicine Clinic.

COLIN CHAMP

Dr. Champ is on oncologist and clinical assistant professor at the University of Pittsburg where he practices radiation oncology and integrative medicine. He researches the impact of diet and exercise on cancer incidence and treatment and has presented his research around the world. His IHMC lecture in Ocala was titled, "Fighting Cancer With Food and Fitness." Champ pointed out that people are inundated with conflicting reports about which foods and activities are healthy or unhealthy. He then provided a survey of dietary and lifestyle activities that been shown to fight and ward off cancer: fasting, carbohydrate restriction, resistance training, vegetables teeming with defense chemicals and ketogenic diets. Champ is the author of "Misguided Medicine." He also is the founder of the Cancer Prevention Project, a not-for-profit that provides recommendation to help prevent cancer through tangible lifestyle changes.

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