FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

ihmc

VOLUME 20 ISSUE 1

IHMC has been on an amazing journey for the past 34 years, and especially the past 20 years as an independent research entity. So it is humbling for me to follow in the footsteps of IHMC's founder, Dr. Ken Ford.

On page 12 of this newsletter, you will read about how Ken is stepping into an emeritus role and how I now have the honor of becoming the institute's new director. Under Ken's leadership, IHMC's growth and discoveries have been the pushing what's possible in science and technology and engineering. Our cutting-edge research is powered by our incredible team here at the institute as well as our extended network of collaborators, donors, supports and friends of IHMC.

Ken is and will remain the heart and soul of IHMC. I look forward to following him because his focus and passion are the same as mine: creating a culture that attracts the best minds from across the world and pushes them to ask the big questions.

Scientific discovery and ground-breaking advances come from the collision of ideas, often the more disparate the areas these ideas come from, the more transformative the scientific advance is. IHMC has always been a sanctuary for the collision of ideas across disciplines. In the process, IHMC strives to impact not only Pensacola and Ocala and Florida, but indeed the whole world through research that advances some of the most important scientific questions of our time.

This newsletter features articles on advances that our robotics and exoskeleton teams are making as well as a clinical trial our Healthspan, Resilience and Performance team is undertaking to better understand the physiological benefits of exercise as humans age. You also will read about the research our Ocala campus is conducting in machine learning and natural language understanding.

I am thankful to be the new leader of IHMC. I also am thankful that Ken has agreed to remain as a mentoring influence for me and all of us here at the institute. And he will continue to lead efforts like our STEM-Talk team as they host conversations with the most interesting minds in science and technology.

Great leaders don't build monuments to themselves. They build entities that will outlive them while reflecting the founding principles. That's what we will continue to advance everyday – making IHMC a collaborative space where serious minds are focused on world-changing research to advance the human condition.

Thank you for staying on this journey with us.

Best,

Morley O. Stone

Morley Stone

Florida Institute for Human & Machine Cognition

A University Affiliated Research Institute

University of West Florida

MOFFITT CANCER CENTER

FAU Florida Atlantic University

UF University of Florida

UCF

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Exoskeleton team tests Eva outside, takes next steps

When Jared Li was job-hunting in late 2020, he had never even heard of the Florida Institute for Human and Machine Cognition (IHMC).

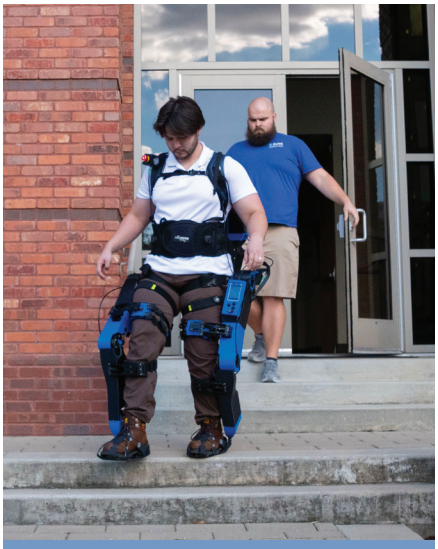
He was helping his parents in West Lafayette, Ind., move when he looked into IHMC at the recommendation of colleagues from his alma mater, the Georgia Institute of Technology. Then he saw a 2015 video of the DARPA Robotics Challenge, an international competition in which the robotics team placed second.

It seemed familiar, Li says, and then he remembered watching it in real time as a young undergraduate.

"I remember just being like, oh, so this is that place," Li says. "I got really excited about the opportunity."

Research Scientist Jared Li testing Eva in the new HRP biomechanics lab

Jared Li taking a break while wearing Eva between testing.



Eva also was tested outdoors for the first time.

He joined IHMC in April 2021 and has served as project manager and lead engineer on multiple augmentative and rehabilitative exoskeletons. He recently was promoted to Research Scientist and now leads exoskeleton research at the Institute. He is focused on real-world applications for the technology, as well as creating a multi-purpose modular platform to assist workers in a wide range of common manual labor movements.

Exoskeletons can provide a mode for exercise and gait training that is difficult to replicate in traditional rehab settings. The IHMC team is interested in seeing how to improve on this, and how coupling exoskeletons with traditional therapies could improve the overall efficacy of the rehabilitation.

Li's exoskeleton work at IHMC dovetailed with his time at Georgia Tech and past internship experience at Sandia National Laboratories, also an IHMC research partner.

IHMC's collaboration with Sandia and Georgia Tech has been exploring how wearable robotic systems can be incorporated into nuclear remediation projects. That work is funded by the U.S. Department of Energy (DOE). The exoskeleton IHMC developed for the DOE is dubbed Eva.

In December 2024, the team took Eva for a test drive in the outside world. The out-of-lab excursion was a critical milestone for the project because it demonstrates the ability of the device to operate outside of controlled environments, which is a critical first step to eventual field usage.

"The ability to wear it yourself, take it out into the world, and understand what the end user is going to feel is tremendously helpful for future development," says Li, who wore the exoskeleton in the test.

The Eva collaboration aims to help address the healthspan issues of a specialized, aging workforce, but there are potentially a host of other applications for the work.

This collaboration also includes establishing an exoskeleton testbed at Sandia to evaluate the efficiency of existing devices and the effectiveness of modifications to other commercial devices.

Li and the team held a demonstration at the Department of Energy's 2025 Waste Management Symposium to demonstrate the prototype.

The team is focused on crafting a modular exoskeleton system that is

easier to use and transport than the current, full-coverage version of Eva. A barrier to uptake of these devices is partly psychosocial — the devices are unattractive, bulky, and difficult to use.

If someone needs the support that an exoskeleton could provide for their knees or hips as opposed to the entire lower trunk, creating a modular system could be a solution. It also would allow for better testing of the impact of the exoskeleton technology on these joints individually, something that is a challenge in the current iteration.

"If it's not convenient, if it's not good-looking, if it doesn't do its job — there's still so many barriers to cross and also we still need to work on the effectiveness of assistance that our devices provide," Li says. "We've shown that our previous exoskeletons have been helpful in certain scenarios. But there are so many other tasks that we need to work on to show benefit to the user during those tasks."

The version of Eva's platform that the team is focusing on now is the hips, knees, and ankle joints.

"Then we could expand the upper body to add attachments to be able to completely cover the whole body and to do very complex, very difficult tasks," Li said. This will eventually help those who are working in unstructured heavy duty manual labor environments and even military service members.

Li calls IHMC a great middle ground between the worlds of academia and industry research. "You can do industry-style robotics research, but you also get the ability to do really cool new things that are normally only available through the academic world.

"Every day is great here, even though the research is hard, and the work can get difficult. A lot of the times you never have a good answer for the problems you're trying to solve. It still is — daily — very satisfying to me."

Eva was tested on stairs.

IHMC's Robotics team tested the Eva exoskeleton outside the lab in late 2024.

Robotics team improving Nadia's behavior and task performance for Office of Naval Research

The Florida Institute for Human and Machine Cognition (IHMC) robotics team lead by Dr. Robert Griffin received $3.7 million from the Office of Naval Research (ONR) for the SquadBot humanoid robotic project.

It is the third round of funding the project has received from ONR to progress the design and functionality of the platform originally dubbed "Nadia." This phase includes the creation of a new robotic platform that will build on what the team has learned in the course of the SquadBot project.

A fully functional SquadBot robot could work alongside and in place of soldiers in operations including building search, patrol, and bomb disposal, potentially reducing exposure to hazards in urban operations.

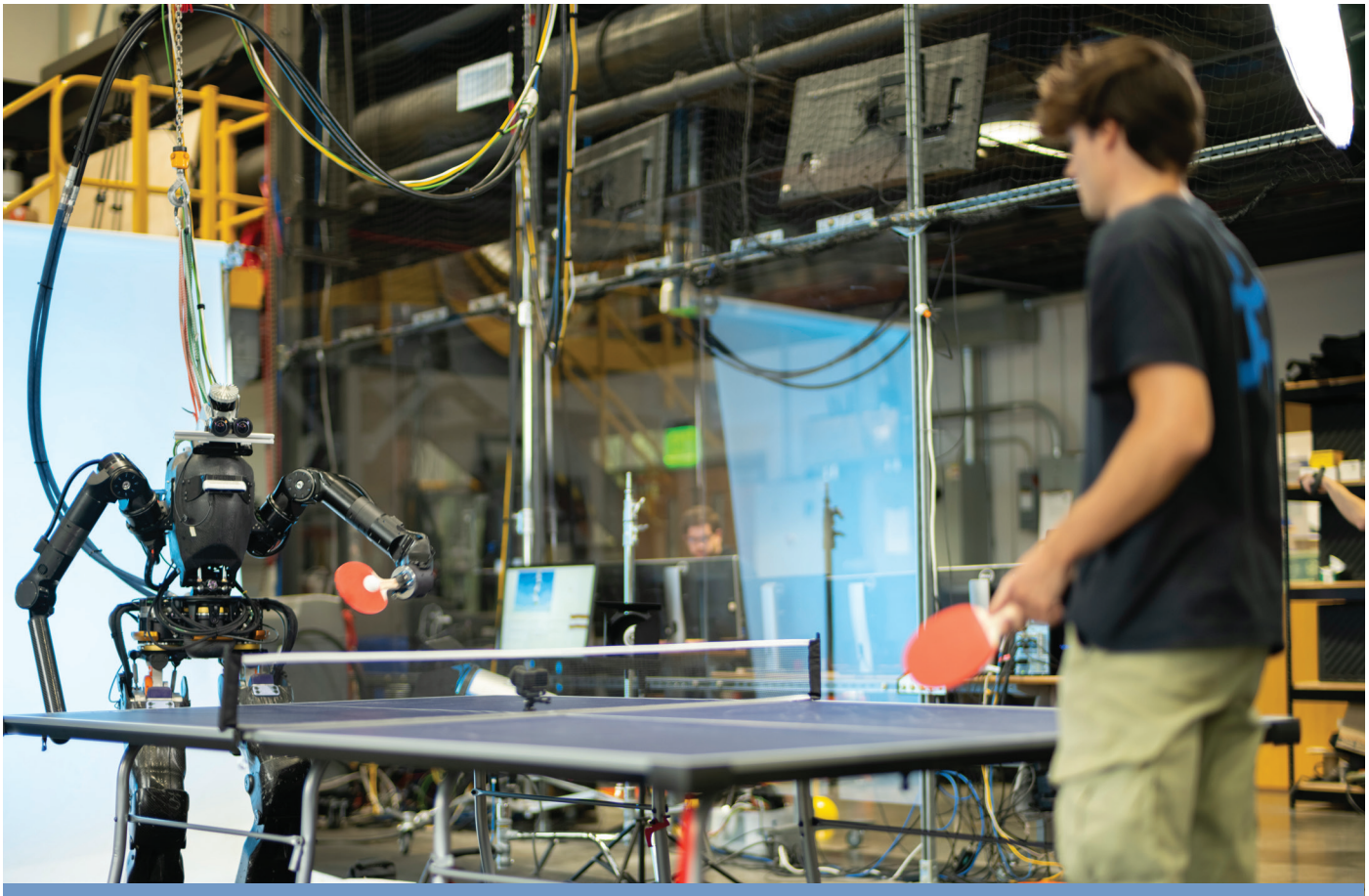
"Nadia really let us expand our behavior architecture and allow the robot to start performing semi-autonomous tasks in a much more robust manner than before," Griffin says.

The team has focused on enhancing Nadia's behavior architecture to include persistence for entering structures and moving objects and obstacles, including the addition of pincer-type "fingers" to allow Nadia to grasp and turn doors, valves, and the like.

Throughout phase two, the team focused on weaving enhanced object recognition capabilities into the behavior architecture. Previously, the team relied on either an operator placing a virtual version of the object before the robot or using binary square markers for the robot to tell what it was looking at.

"We focused on applying this to objects a robot might encounter in a room, but the primary focus was on opening doors," says Griffin.

Without the ability to open and navigate through doors, the robot is limited in the number of real-world applications it can perform. Now the



Nadia gained YouTube notoriety playing ping pong against Research Scientist Dr. Luigi Penco, as demonstrated here.

robot can use these capabilities to autonomously open a door with a handle, a doorknob, and a push-bar with more weight resistance to better reflect real-world applications.

A critical piece of Nadia's evolution has been improving the platform's behavioral resilience. Adding failure detection to the behavior architecture gives Nadia the ability to repeatably try to open a door if it does not at first succeed, Griffin says.

In this iteration, Nadia gained a bit of internet notoriety when people saw YouTube videos of Nadia boxing and playing ping pong, thanks to a focus on improving the robot's teleoperation ability. While the team has always had excellent teleoperation capabilities through virtual reality, the goal was to lower the delay with the real world, what the operator sees in the headset, and the actions the robot takes based on operator input.

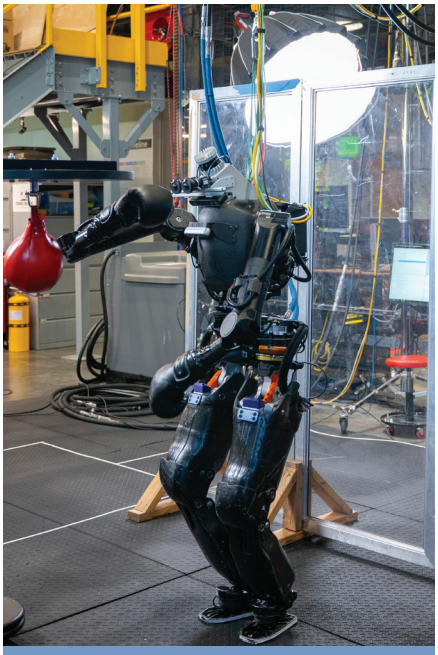
Playing ping-pong successfully requires extremely little delay between translating observations to actions, meaning the operator must see things essentially as they happen, and then the robot has to be extremely responsive to the operator's actions, Griffin says.

"We think this will be an extremely powerful tool moving forward as we continue to try and tackle highly dynamic tasks," Griffin says. "If we really want robots that can navigate around human-made environments and perform human-like tasks, they must have an understanding of the world around them and how to interact with it.

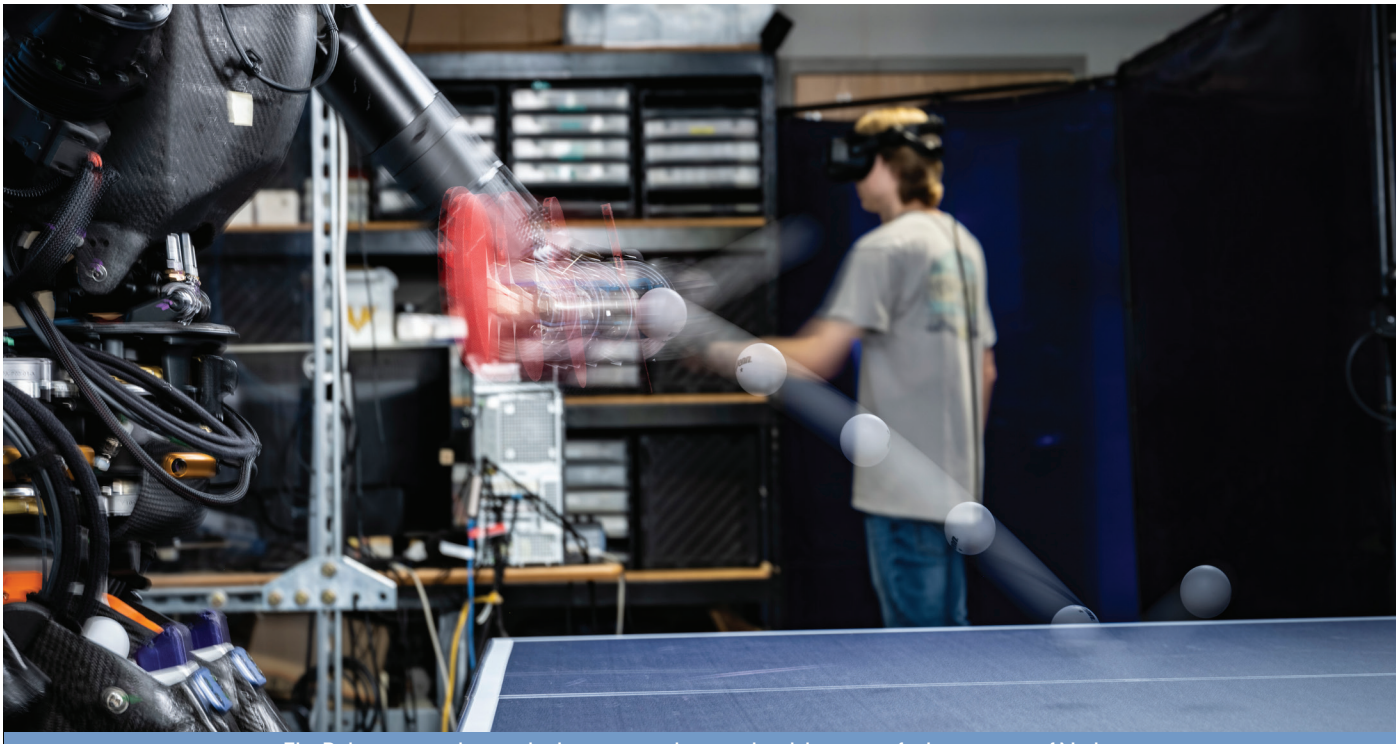
"This new and improved architecture will be the cornerstone of giving the robot the ability to understand the environment and work with an operator to achieve new tasks."

Griffin and the team will use this experience and data to finish the design of the next version of the robot, which will not be another iteration of Nadia.

"We'll incorporate all that we've learned on Nadia to make a new and improved platform that is really focused on going out of the lab and tackle extremely challenging tasks," Griffin says.



Nadia stirred YouTube interest with video showing the humanoid's boxing prowess.



The Robotics team has worked to improve the speed and dexterity of teleoperation of Nadia, which is shown being controlled by Research Associate Dexton Anderson.

Participants needed for clinical trial to learn more about how exercise benefits older adults

Senior Researcher Kana Meese and Research Associate Sophia Bamman at work in the lab.

If you are age 60 or older, the Florida Institute for Human and Machine Cognition (IHMC) wants you for a seven-month trial to uncover more about how older people benefit from exercise.

The results of the trial are aimed toward personalizing an exercise prescription to maximize the health benefits for older adults and could help researchers understand more about the physiological benefits of exercise as we age.

This clinical trial, which is fully supported by a National Institutes of Health award to Dr. Marcas Bamman, is a collaboration among the Oklahoma Medical Research Foundation and the University of Florida. Recruiting for 250 participants is under way in Oklahoma City and Pensacola.

It is precisely the kind of project that IHMC's new Healthspan, Resilience, and Performance complex was intended to support, says Bamman, the Principal Investigator and Senior Research Scientist who leads that team.

"Exercise is a potent treatment with promise to mitigate most aging hallmarks, but there is substantial variability in individual exercise responsiveness," Bamman says. "We believe this trial will help us learn more about why that variability occurs, along with strategies to help boost responsiveness."

The trial is called Multidimensional Modeling to Maximize Adaptation to Exercise (M^3AX). This individual response variability was first identified in the context of endurance training and later was established with resistance training by current members of the IHMC team nearly 20 years ago. M^3AX is the chance to build upon that finding to learn more.

Age-related functional declines are thought to be caused by biological processes that ultimately compromise healthspan and quality of life. Low cardiorespiratory fitness and low functional muscle quality are both manifestations of the deterioration in the cellular hallmarks of aging. And both metrics can be modified with endurance and resistance training.

M^3AX will test the hypothesis that factors central to aging itself – protein metabolism, cellular energetics, inflammation and circadian rhythms — are contributors to what determines whether someone experiences clinically important improvements in cardiorespiratory fitness and functional muscle quality through exercise training.

Dr. Marcas Bamman

Craig Tuggle

Senior Research Associate Craig Tuggle will manage the project.

Key to the success of the trial will be the recruitment of 250 people willing to commit to a highly structured 23-week exercise training regimen.

"It is a big commitment we are asking of participants but based on past experience with clinical trials in this age group, we think they will enjoy participating," Tuggle says.

Other M³AX team members include co-Principal Investigators Zachary Graham and Jeremy McAdam; Senior Research Associate Kana Meece; Research Associates Sophia Bamman, Ed Chappe, Amrit Kaur, Trevor Perry, Benny Ruiz, Katherine Vanselow, and Rachel Wright; Clinical Staff Gregory Addison; and Clinical Research Coordinator Michelle Bowers.

In addition to the exercise training three times per week, participants will undergo several clinical performance assessments, learning about themselves while contributing to scientific discovery.

The training protocol includes three days a week of cardio training and three days a week of weight training. After roughly 12 weeks on an endurance and resistance training protocol, the participant pool will be re-evaluated based on how they are responding.

For Phase II, some participants will receive targeted augmentation into either a boosted exercise prescription and free-living recommendations, while others will continue the endurance and resistance training protocol.

The free-living protocol will include use of digital wearable tech to help track physical activity, heart rate, sleep behavior and quality, circadian clock settings, continuous glucose monitoring and dietary intake.

Aging Symposium comes to IHMC in April 2025

Skeletal muscle is vital to human health and disease management, particularly as we age, but the muscle mass and functional declines that come with aging are influenced by a complex web of biological and behavioral factors.

In April 2025, the Florida Institute for Human and Machine Cognition (IHMC) will host experts across a host of disciplines for the "Skeletal Muscle in Aging, Healthspan, and Disease" symposium, organized by Dr. Marcas Bamman, Senior Research Scientist at IHMC and director of the Healthspan, Resilience and Performance research team.

"The symposium is an opportunity to discuss the state of knowledge on mechanisms and countermeasures, identify knowledge gaps, and we hope, chart a path toward high-impact research priorities," Bamman said.

Topics for discussion will include:

Hospital-Associated Disability, Dr. Cynthia Brown, Louisiana State University Health Sciences Center.
End of Life and Muscle Health: Proxies and Prognosis, Dr. Dan Sontheimer, Baptist Healthcare.
Research Priorities in Aging Skeletal Muscle & Healthspan, Dr. Amanda Boyce, Dr. Monica Serra, Dr. Lyndon Joseph, NIH National Institute on Aging.
Age-Regulated Mechanisms Affecting Muscle Mass and Function, Dr. David Glass, Regeneron Pharmaceuticals.
Changing Focus from Protein Mass to Proteostasis for Healthy Muscle Aging, Dr. Benjamin Miller, Oklahoma Medical Research Foundation & Oklahoma City Veterans Affairs Medical Center.
Epigenetic Mechanisms of Skeletal Muscle Aging, Dr. Payel Sen, NIH National Institute on Aging.
Tryptophan Metabolism: A Key Modulator of Functional Decline, Frailty and Aging, Dr. Reyhan Westbrook, Johns Hopkins University.
Cellular Senescence and Skeletal Muscle Aging, Dr. Nathan LeBrasseur, Mayo Clinic – Rochester.
The Aging Circadian Clock in Muscle: New Target for Therapeutics?, Dr. Karyn Esser, University of Florida.
MuRF1, E3 Ubiquitin Ligases & Regulation of Muscle Mass, Dr. Sue Bodine, Oklahoma Medical Research Foundation and Oklahoma City Veterans Affairs Medical Center.
Mitochondrial Involvement in Aging Skeletal Muscle, Dr. Russell Hepple, University of Florida.
XPRIZE Healthspan Innovations Landscape: Global Strategies to Improve Muscle, Cognitive, and Immune Function in Aging, Dr. Jamie Justice, XPRIZE Healthspan.
Resistance Training in Older Adults: a Function Promoting Therapy with Robust Treatment Response Heterogeneity, Dr. Roger Fielding, Tufts University.
Elite Human Performance Across the Lifespan, Dr. Scott Trappe, Ball State University.

Ocala Research Showcase highlights work in machine learning, natural language understanding, speech analysis and more

The Ocala community has long supported the Florida Institute for Human and Machine Cognition (IHMC), but to many, the research that goes on there is a bit of a mystery.

Ocala's campus is home to computer scientists, engineers, and linguists engaged in research spanning machine learning, natural language understanding, social cybersecurity, and speech analysis for physiological state determination.

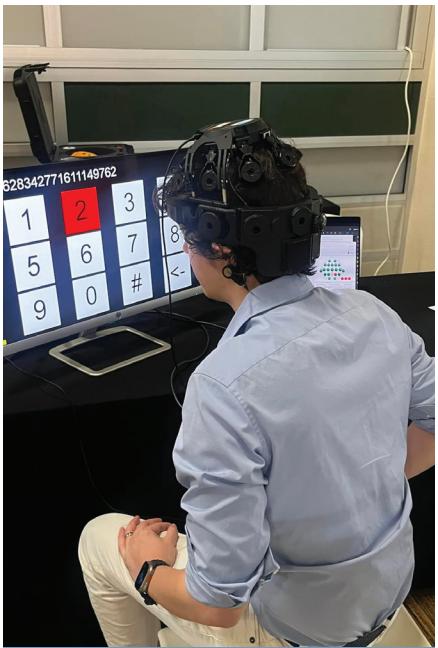
The inaugural Ocala Research Showcase in November 2024 was an open house-style event highlighting IHMC scientists and sharing the impact their research can have in artificial intelligence and machine learning, robotics and exoskeletons, and healthspan, resilience, and performance.

Research Scientist Dr. Ian Perera led the coordination of the event along with Laurie Zink, development and community outreach director at the Ocala campus.

"(The showcase) created an opportunity to open up opportunities for collaboration with industry and researchers, engage with educators to help them better understand how to prepare their students for the rapid changes in technology their students will experience, and reach out to the public to show them the work we're doing to augment their capabilities," Perera said.

"Many visitors had never heard of IHMC and were amazed that we were engaged in such interesting work in their community," Perera said. "Educators were very impressed with the potential of technology to provide more insight into the human condition."

Dr. Marcas Bamman at Ocala Research Showcase.



Dr. Ian Perera giving a research demonstration.

Projects featured included:

- A cognitive assessment deployed in both virtual reality and an online platform to aid in early detection of mild traumatic brain injury.
- Hardware to track eye movement as an indicator for divers' physiological state. Changes in an air mixture can rapidly affect a diver's cognitive state, and early detection can save lives.
- Applying Large Language Models and Reinforcement Learning to teach LLMs to automatically learn to solve open-ended puzzle games, which is challenging for current models.
- A partnership with the U.S. Army Research Laboratory to develop questionnaires and tasks that identify the core cognitive skills needed to work with AI.
- A memory augmentation project focused on harnessing Natural Language Processing to help seniors with dementia retrieve words in the course of daily life.
- A project using EEG to determine a person's cognitive state, their reaction to stimuli, and their innate or learned skills in certain tasks.
- Work in the new Healthspan, Resilience, and Performance Research Complex to better understand the factors that determine healthspan and performance.

IHMC partners with Space Florida, TechFarms Capital to host Pitch Day event for startups

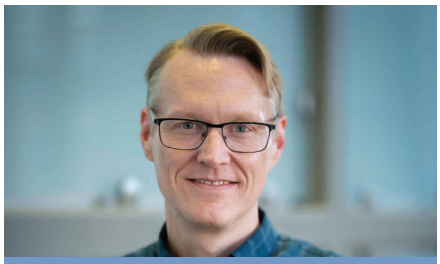
Cultivating innovation is in the DNA of the Florida Institute for Human and Machine Cognition (IHMC).

The Takeoff: 2024 Northwest Florida Pitch Day was another opportunity for the partnership between IHMC and Space Florida to yield fruitful results in the name of innovation.

Three IHMC Research Projects were featured at The Takeoff, a forum for regional startups and researchers to share their stories in front of venture capital and investment firms.

Dr. Morley Stone, IHMC's Chief Executive Officer, said The Takeoff "showcased IHMC's growing commercialization interests and Florida's prominence as a hub for cutting-edge technology, investment, and entrepreneurship, reinforcing the region's role in shaping the future of innovation."

IHMC Presenters were selected for award for the following projects:



Dr. Jeff Phillips

Tactile Glove Technology
Senior Research Scientist Dr. Jeff Phillips' project for the U.S. Air Force School of Aerospace Medicine that aims to create haptic gloves with a tactile selector embedded to improve dexterity and performance of in-flight tasks. The patented selector improves haptic feedback and precise digital manipulation of touch screens and other controls while wearing gloves.

Andy Bellina

Airborne and Portable Electromagnetic Sensing
Senior Research Associate Andy Bellina shared a project to design a low Size Weight Power and Cost (SWaP-C) Electromagnetic Radiation (EM) detector/receiver that is light enough to be deployed on a small Unmanned Aircraft System, but adaptable enough to be used as a wearable. This kind of sensor leverages low-cost components and can be built with off-the-shelf parts, making it affordable yet functional for educational, search and rescue, or surveillance applications.

Daniel Duran

KENNEL Threat Detection System
Senior Research Associate Daniel Duran highlighted a threat detection system that could provide a lower-cost initial line of defense for critical infrastructure and military personnel. These networked sensors can track light, temperature, motion, chemical, biological, radiological, nuclear, and explosive exposures.

Commercial sector presenters that earned awards included:

ATOR Labs: ATOR is a Panama City-based company focused on respiratory protective device testing. ATOR showcased Omnicheck, a testing device for respiratory protective devices to ensure employee safety across industries such as firefighting, oil and gas, chemical, and nuclear, and Automated Breathing Metabolic Simulator, used as a foundation for device testing.

RSAE Labs: RSAE is a Lynn Haven-based company that is disrupting the global logistics industry. The company is innovating in the Internet of Things (IoT) landscape with a proprietary protocol technology.

Piersica: Piersica is a Tallahassee-based company leading energy storage innovation with next-generation solid-state batteries. The company has a solid-state separator with higher conductivity than conventional separators and a new lithium metal anode structure that improves upon current anode technology.

In addition to IHMC and Space Florida, the state entity that promotes aerospace and space-related business development, financing, research and development, event sponsors were TechFarms Capital and Saltmarsh, Cleaveland & Gund.

Kelly Reeser, General Partner, TechFarms Capital, said the event was key to mobilizing investment capital in Northwest Florida. "The dynamic exchange between investors and founders/technologists was palpable, and we're excited about the positive impact this will have on our collective future."

Research Council established at IHMC

In any institution, with growth comes challenges to the culture and practical norms that have always been in place.

At a time of significant change, the Florida Institute for Human and Machine Cognition (IHMC) has established a Research Council to help keep the voice of researchers front and center.

Dr. Morley Stone, the Institute's Chief Executive Officer, established the board in 2024. Stones says "the Council is a vehicle to address issues that arise, to increase efficiencies across our research pillars, and to allow us to speak with one voice in prioritizing what matters to our research staff."

Along with Stone, the Research Council membership includes:

Dr. Niranjan Suri, IHMC's Associate Director and Senior Research Scientist, focuses his research on networking, communications, distributed systems, information management, interoperability, Internet of Things (IoT), and the application of Machine Learning to all of those domains

Dr. Tim Broderick, IHMC's Chief Science Officer and Senior Research Scientist, helps shape overall research strategy and focuses his own research on human health and performance in extreme environments.

Dr. Marcas Bamman, Senior Research Scientist at IHMC, leads healthspan, resilience, and performance research in populations ranging from elite performers to people with chronic metabolic diseases. He has led clinical trials focused on biological response optimization and treatment interactions.

Dr. Matt Johnson, an IHMC Senior Research Scientist who focuses on human-machine teamwork. His research has been applied to robotics, AI, software agents, drones, and autonomous vehicles in domains including disaster response, space applications, aviation, and military operations.

Attorney Wes Reeder joins board of directors

Pensacola attorney H. Wesley "Wes" Reeder has joined the board of directors of the Florida Institute for Human and Machine Cognition (IHMC).

"Wes' background is a perfect match for IHMC," says Dr. Morley Stone, the Institute's Chief Executive Officer. "We are fortunate to have him on our board and I look forward to drawing upon his knowledge and experience."

Reeder says he has long admired IHMC and its work from afar.

"It is exciting now to have the opportunity to help share the story of this world-class organization to the community at large," he says.

A Martindale-Hubbell AV rated attorney recognized as a Florida Legal Elite attorney and a Florida Super Lawyer, Reeder has extensive expertise and experience in the areas of construction, commercial litigation and real estate litigation.

H. Wesley Reeder

As a Florida Supreme Court Certified Circuit Civil Mediator, he serves clients statewide with an emphasis on the Panhandle and North Florida.

Reeder is a retired Naval Reserve Officer with more than 24 years of aviation industry related service to the federal government and the U.S. military. While on active duty in the U.S. Navy, he served as a crewman with the Naval Flight Demonstration Squadron, better known as the Blue Angels.

"As a retired service member, I have always been interested in the work IHMC does in support of our military's mission, both on a broad operational scale and in relation to research and development," Reeder says. "Personally, just being able to associate and work with all the talented individuals at IHMC is very exciting."

Community service is important to Reeder, as can be seen by his involvement and leadership in several local and regional associations including the Naval Reserve Officer Association, Greater Pensacola Chamber of Commerce, Gulf Breeze Rotary Club, Pensacola Heritage Foundation, Blue Angels Alumni Association, Pensacola Runners Association, Fiesta of Five Flags, and Pensacola Navy Days.

Community celebration marks IHMC's past, present, and looks forward to the future

After more than 34 years under the leadership of founder Dr. Ken Ford, a new leader took the reins at the Florida Institute for Human and Machine Cognition (IHMC). Ford stepped into an emeritus role as of January 2025. Dr. Morley Stone assumed the role of Chief Executive Officer, having served as Chief Strategic Partnership Officer.

Though he has moved into an emeritus role, Ford will remain a vital part of the IHMC community.

"When Morley joined IHMC, I believed he would have a game-changing impact," Ford says. "I have full confidence that the team we have assembled is poised to do just that and I am certain he will lead IHMC into a promising future for many decades to come."

In November 2024, the Institute celebrated 20 years as an independent nonprofit research entity. The event noted IHMC's evolution from a small office inside the University of West Florida into an independent research entity with an international reputation for excellence and innovation, all under Ford's guidance.

"As IHMC has evolved, the path that Ken laid out for us has been thoughtful and purposeful," Stone says. "We've built a virtuous circle here of collaboration and innovation. The commitment to that will not change on my watch, and I am looking forward to what the next chapters of our story will bring."

Dr. William Dalton, chairman of IHMC's Board of Directors, said the board is grateful for Ford's contributions.

"IHMC has gained a profound reputation for the contributions it has made over the years, and that reputation is embedded in the scientific endeavors performed by Ken and his colleagues," Dalton said. "We are all grateful to Ken and all he has done for society in building IHMC, and Morley for leading us in our future endeavors."

IHMC Founder Dr. Ken Ford and Senior Thinker and Raconteur Jeffrey Baxter at the 20th Anniversary Celebration.

Dr. Morley Stone became IHMC's CEO in January 2025.

Welcoming new research scientists and research associates

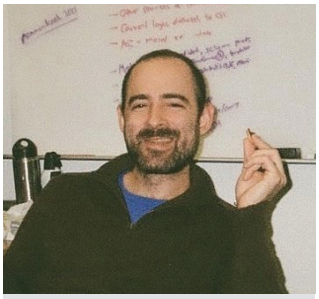
Our team is always growing, and we are pleased to welcome new members into the fold at the Florida Institute for Human and Machine Cognition (IHMC). With a reputation for excellence across all of our core disciplines, IHMC remains focused on re-examining the relationship between human and machines.

JP ERRICO, SENIOR RESEARCH SCIENTIST

J.P. Errico joined IHMC in 2025 as a Senior Research Scientist. An accomplished inventor, he received his undergraduate degree in aeronautical engineering from the Massachusetts Institute of Technology and worked at the Air Force National Laboratory, Lincoln Laboratories. He holds both law and mechanical/materials engineering graduate degrees from Duke University.

He trained as a patent attorney in New York and is the author of a treatise on international intellectual property law. He previously founded and sold or took public numerous med-tech ventures, including Fastenetix, K2 Medical Systems, AD4-Pharma, E2, and SpineCore. Products conceived by those companies have generated more than $15 billion in sales.

He is a named inventor on more than 125 issued US patents and is a named inventor on more than 230 pending US applications. Additional patents and patent applications outside the US on which he is a named inventor number greater than 250. He is currently Chief Science & Strategy Officer at electroCore.



WILL HANCOCK, RESEARCH SCIENTIST

Will joined IHMC as a Research Scientist in January 2025 working with Ian Perera and human-machine communications and language processing team. He was drawn to IHMC by the institute's approach to artificial intelligence, its applications, and its philosophy. He says he has been greatly influenced by Senior Research Scientists Emeritus Dr. Pat Hayes and Dr. James Allen.

Will studies knowledge representation and learning, though he is particularly interested in studying episodic memory in people and using this knowledge to build better AI systems.

He earned his Ph.D. in computer science at Northwestern University in Evanston, Ill. He earned a master's and bachelor's degree in computer science from the Georgia Institute of Technology.

In his free time, he enjoys spending time with his wife and children and loves the outdoors. He is a guitar player and amateur bicycle mechanic who loves travelling on his bike, having ridden through Scotland, Japan, and in 2013 from Atlanta to Los Angeles.

NICOLE RENDOS, RESEARCH SCIENTIST

Nicole joined IHMC in February 2025 as a Research Scientist working with the healthspan, resilience, and performance team. She comes to IHMC from Emory University, School of Medicine, where she was director of the Gait, Exercise, and Rehabilitation (GEAR) Lab.

Her academic training includes the fields of biomechanics, motor control, rehabilitation, and exercise physiology. Her research interests have included projects using real-time gait biofeedback as an intervention for diabetic neuropathy, and muscle use and activation patterns in runners.

Her appointment is in collaboration with the University of West Florida, where she is a faculty member of the Usha Kundu MD College of Health.

She earned a bachelor's degree in athletic training from West Virginia University. She earned a master's degree from the University of Virginia and Ph.D. in exercise physiology from the University of Miami. She serves on multiple standing committees through the American College of Sports Medicine and American Society of Biomechanics and was most recently elected President-Elect of the American College of Sports Medicine Southeast Chapter.

In her free time, she enjoys the outdoors and spending time with her husband and two young sons. She is also a marathoner and Ironman triathlete who is getting back to long-distance training.

ANDREW BROOK, RESEARCH ASSOCIATE

Andrew joined IHMC in November 2024 as a Research Associate working with John Carff and the robotics group.

His work as a software developer and game designer includes a focus on leveraging his skills in gameplay programming, design, and problem solving to contribute to the development of cutting-edge interactive experiences. He was drawn to IHMC as an advocate for the use of virtual/augmented reality to push advancement in fields where it can truly help people, especially in science and academics. He earned a bachelor's degree in game design and development from the Rochester Institute of Technology.

TIMOTHY NALL, RESEARCH ASSOCIATE

Timothy joined IHMC as a Research Associate in October 2024 working with Larry Bunch and his team on the TEDO-MDO project. He had previously worked at IHMC and is an aerospace systems engineer. He earned an ABET accredited bachelor's degree in Engineering Physics from the University of Oklahoma and he completed postgraduate coursework at California State University.

Before joining IHMC, he worked for The Boeing Company as a systems engineer on a variety of U.S. Department of Defense platforms. While there, he volunteered as a mentor to a FIRST Robotics team helping them reach the Championships in his second year on the team.

In his spare time, he enjoys West Coast Swing Dancing and frequently travels to events and competitions. He is also into exotic cars and F1 racing.

BRITTNEY CLARK, PROJECT MANAGER

Brittney joined IHMC in January 2025 as a project manager with the robotics team. She comes to IHMC after more than a decade of experience with Intel in the semiconductor industry, where her background includes software development, software optimization, and program management.

Her career interest lies within execution of engineering tasks in alignment with business objectives with internal and external partners through facilitating collaborative environments and celebrating team success.

She is a graduate of Arizona State University, where she earned a bachelor's degree in computer systems engineering in 2015 and a Master of Business Administration degree in 2022.

She lives with her husband, son (soon-to-be two sons), and their two family dogs. She enjoys CrossFit, watercolor painting, and gardening in her spare time.

PATRICIA MOHAN, EVENTS COORDINATOR

Patricia joined IHMC in February 2025 as events manager. In this role, she will be responsible for managing logistics and coordination for IHMC visitors and guests, the Afternoon Lecture series, school tours and field trips, onsite and offsite conferences in collaboration with research team members, employee social events, outreach events, and other administrative team tasks.

She brings to IHMC a background in events and sales management in the hospitality industry.

She is a member of the board of directors of Pensacola Sports Association, a commerce ambassador for the Pensacola Chamber of Commerce and a volunteer member of the Fiesta Forces of Fiesta Pensacola.

STEM-Talk wins Signal Award recognizing podcasts that help define culture

STEM-Talk, IHMC's podcast, recently garnered another accolade, winning the bronze award in the third Annual Signal Awards for best General Health and Wellness podcast.

The episode included in the Signal Awards Winners Gallery features Dr. Marc Hamilton, who has published pioneering work on the soleus push-up, a potent physiological method with the ability to elevate metabolism for hours, even while sitting. Hamilton is well-known for a string of papers beginning in early 2000's that found excessive sitting should be viewed as a serious hazard to health and well-being.

Hamilton is an international expert in muscle physiology his research has focused on solving some of the most difficult scientific problems about metabolism and biochemistry. This includes determining the effects of sustaining a higher metabolic rate, by oxidative muscle metabolism, for hours throughout the day (not minutes). His laboratory at the University of Houston has conducted both basic science research in animal models and translational work in humans to develop and test biomedical strategies for disease prevention across the whole lifespan.

Listeners can hear more about how the study of the soleus muscle and its function evolved in Hamilton's lab what proper activation of the soleus muscle looks like, and what the impacts of proper activation of this muscle can be.

"STEM-Talk made an impression on the judges," said Jemma Brown, General Manager of The Signal Awards. "This award is a testament to the skill, ingenuity, and vision of its creators."

Dr. Ken Ford, IHMC's CEO emeritus, co-hosts STEM-Talk with colleagues from IHMC, including Drs. Dawn Kernagis, Marcas Bamman, and Tommy Wood. The STEM-Talk team also includes Randy Hammer, William Howell, Jordan Accardo, and Shannon Nickinson.

"We began STEM-Talk to create a venue for thoughtful and insightful conversations with scientists, researchers, and experts of the highest caliber," Ford says. "Awards such as the Signal Award are a gratifying recognition of our continuing efforts."

The podcast has been downloaded by more than 4.3 million people across the world since its launch in 2016. In 2019 and 2017, STEM-Talk won first place in the Science and Medicine category of the annual People's Choice Podcast Awards. In 2020, STEM-Talk was nominated for a Webby Award in Science and Education.

The full STEM-Talk library, which includes more than 175 episodes is available on IHMC's website and major podcast platforms.

The Signal Awards set a standard for editorial excellence by honoring the organizations, artists, mavericks and brands who are shaping the podcast industry, and the storytelling medium. Entrants are reviewed by The Signal Awards Judging Academy, an esteemed collective made up of the architects, instigators and trailblazers of the podcasting medium.

Each year, The Signal Awards present Gold, Silver and Bronze Award Winners, and the listening public votes for their favorite Finalists to take home the additional honor of Listener's Choice Award in each category.

STEM-Talk co-hosts Dr. Ken Ford and Dr. Dawn Kernagis lead conversations on the award-winning podcast.

IHMC is a not-for-profit research institute of the Florida University System where researchers pioneer science and technology aimed at leveraging and extending human capabilities. IHMC researchers and staff collaborate extensively with the government, industry, and academia to conduct ground-breaking science and develop breakthrough technologies. IHMC research partners have included: DARPA, the National Science Foundation, NASA, Army, Navy, Air Force, National Institutes of Health, IBM, Microsoft, Honda, Boeing, Lockheed, and many others.

STEM-Talk features experts in inflammation, Alzheimer's, hormone replacement therapy, and more.

STEM-Talk, with more than 170 episodes, features conversations with some of the most interesting people in the world of science and has been downloaded by more than 4.3 million people across the world since its launch in 2016. In 2024, it won the bronze award in the third Annual Signal Awards for best General Health and Wellness podcast. In 2019 and 2017, STEM-Talk won first place in the Science and Medicine category of the annual People's Choice Podcast Awards. In 2020, STEM-Talk was nominated for a Webby Award in Science and Education.

Host Dr. Ken Ford and his cast of co-hosts have meaningful and compelling conversations with thought leaders, scientists, and experts in multiple disciplines. Subscribe to STEM-Talk on your favorite podcast platform, follow us on our YouTube channel, or browse the full library of episodes on our website, https://www.ihmc.us/stemtalks/

DR. KEVIN TRACEY, EPISODE 172

Few people know as much about inflammation and neuroscience as Dr. Kevin Tracey does. So how does he explain what inflammation — whose identification can be traced back to Galen of Pergamon, a second century Roman physician — means to human health? "Every year, 60 million people die on Earth," he says. "Two-thirds of them — 40 million people — die of a disease caused or made worse by inflammation." In this episode, we learn much from Tracey, a neurosurgeon, a pioneer in bioelectrical medicine and president and CEO of the Feinstein Institutes for Medical Research in Manhasset, N.Y. Tracey was the first to identify the inflammatory reflex, a physiological mechanism that regulates the body's immune response to injury and invasion. He sees inflammation as "the single major threat to long healthspan because it contributes to the major killers and major unsolved diseases on the planet."

DR. ANURAG SINGH, EPISODE 173

Dr. Anurag Singh has spent his career using research to unlock a better treatment path for the chronic diseases that dominated his early medical practice. "I felt I was blindly treating the symptomology of these chronic diseases (cancer, diabetes), and it gave rise to the question, 'What if we could intervene earlier?'" Singh says. Singh, now chief medical officer at a Swiss life science company, is known for his research into the gut metabolite urolithin-A, which has been shown to improve muscle quality, protect immune systems, and optimize mitochondrial efficiency. This compound is produced by gut bacteria from metabolizing ellagitannins and ellagic acid, which are found in foods such as pomegranates, raspberries and blackberries, walnuts, pecans. In this conversation, Singh shares how his desire to put "hard biology" at the root of nutritional approaches to healthspan is having groundbreaking impact.

DR. RUDY TANZI, EPISODE 174

Dr. Rudy Tanzi is known for co-discovering all three familial early onset Alzheimer's genes, expanding what we know about the disease, how we might counter its effects, and the speed with which drug therapies can be brought to market. He has co-written two books with Deepak Chopra and is one of the top 50 most cited neuroscientists in the world. "If you ask what leads to cognitive decline with age, or in a more serious way, what determines the degree of dementia once Alzheimer's Disease begins, the answer is the same — the loss of synapses," Tanzi says. "Inevitably as you age, synapses get lost. It's our job to build synaptic reserves because the more synapses you make, the more you can lose before you get into trouble. The way you build synapses is simple: You learn new things."

DR. HANS VAN DONGEN, EPISODE 175

Dr. Hans Van Dongen joins STEM-Talk to explore his research on sleep deprivation, shift work, fatigue risk management, and more. He also explores the interplay among the body's circadian system and its homeostatic system — a system that aims to correct our circadian balance when it is off. The conversation covers many of the psychological, cognitive, and physical effects of sleep deprivation he has discovered in his research. "When people are sleep-deprived, the salience of information that says what you are trying to do is not helpful is dampened," he says. "You can recognize there is a problem and you can't remediate it." Van Dongen is the director of the Sleep and Performance Research Center at Washington State University.

DR. JOANN MANSON, EPISODE 176

Dr. JoAnn Manson is an endocrinologist, epidemiologist, and principal investigator of several research studies, including the landmark Nurses' Health Study and the Women's Health Initiative, which continues to yield information important to women's health. Her mother's death from ovarian cancer was just one of the factors that fueled her research interests and she has spent her career shedding light on women's health and public health overall. She was featured in the National Library of Medicine's exhibition, History of American Women Physicians. Her work has focused on trials of nutritional and lifestyle factors related to heart disease, diabetes, and cancer and the role of endogenous and exogenous estrogens as determinants of chronic disease.

DR. FRANK BUTLER, EPISODE 177

Frank Butler has saved countless lives due in large part to something he saw as a college sophomore. Inspired by a demonstration by the Navy SEAL Team he saw in 1969 while on a ROTC scholarship, Butler served as a SEAL platoon commander before he went to medical school. These twin tracks led Butler, an ophthalmologist and retired Navy Undersea Medical Officer, down a path that ultimately changed the way battlefield medicine is conducted. On Jan. 2, 2025, he received the Presidential Citizens Medal from President Joe Biden for introducing Tactical Combat Casualty Care in 1996 to battlefield trauma care, setting new standards for tourniquet use for injuries in war and in civilian life. Butler says prior to TCCC, pre-hospital battlefield trauma care had remained largely unchanged for nearly 130 years after the Civil War. "(That lack of innovation) was a stunning thing to realize," Butler says.

DR. KARL HERRUP, EPISODE 178

Dr. Karl Herrup has made a career of trying to unravel the underlying cause of Alzheimer's disease. For decades, the leading theory has been that abnormal amyloid plaques in the brain are the central cause of the disease. Herrup says this hypothesis is not only flawed, but also could be holding back research for a cure. "At root, the problem stems from trying to make a complicated disease simple," Herrup says. "At a more practical level, the problem goes back to the very first description of the disease itself by the guy whose name is on the disease." The history of assumptions made about the disease, and the impacts those assumptions have had since is just part of our conversation with Herrup, an author and professor of neurobiology and an investigator in the Alzheimer's Disease Research Center at the University of Pittsburgh School of Medicine.

IHMC's Evening Lectures covered exploration of Mars, ketamine therapies, and much more

Dr. Pascal Lee had led more than 30 expeditions to the Arctic and Antarctic to gain knowledge that might be helpful for a greater adventure — Mars.

Lee, a planetary scientist with the SETI Institute, the Mars Institute, and NASA Ames Research Center, brought his vision for reaching this next, lofty goal to the first Pensacola Evening Lecture of 2025 hosted by the Florida Institute for Human and Machine Cognition (IHMC).

The Ocala Lecture Series' saw Dr. Johnathan Edwards in January speak on "Ketamine: From Anesthetic to Healer." Edwards, a past guest on IHMC's STEM-Talk podcast, shared ketamine's potential as a mental health treatment, its ability to stop suicidal ideation, and its efficacy in treating depression and PTSD.

Lee's January talk was "Moon to Mars: Our Amazing Human Exploration Future Ahead," and examined current plans to return to the Moon and journey on to Mars, the challenges this presents, the wonders that lie ahead, and the choices needed to make this possible.

Dr. Pascal Lee

Dr. Johnathan Edwards

Visit https://www.ihmc.us/life/evening_lectures/pensacola-lecture-series/ for the most updated schedule and to watch video recaps of past lectures.

PENSACOLA LECTURES

Feb 13: Dr. Tim Broderick, IHMC, "Wearable Devices That Extend Human Health, Performance, and Teaming."

March 4: Michael Larson, IHMC, "Sleep - what it is, why we can't do without it, and how IHMC is using technology to aid in deeper more restorative sleep without resorting to drugs."

April 24: Dr. Dave Rabin, Apollo Neuroscience, "The Art and Neuroscience of Self-Healing and Learning."

May 22: Lilianne Mujica-Parodi, Director of the Laboratory for Computational Neurodiagnostics at Stony Brook University.

In Pensacola, the series' Premier Sponsor is The Bear Family Foundation. Season Sponsors are The Orth Family, Clark Partington, and Joanne Bujnoski and Martin Kandes. Lecture Sponsors are Dr. Ed and Judy Galbavy: Carousel House and Dry Farm Wines.

OCALA LECTURES

Feb 11: Dr. Pascal Lee, SETI Institute, the Mars Institute, and NASA Ames Research Center, "Establishing a Moon Base at Clavius Crater."

March 22: Butler Hine, IHMC, Flight Project Manager/Chief Technologist for Engineering at the NASA Ames Research Center, "The Promise of Spacecraft Swarm Missions."

April 10: Dr. Daniel Britt, Pegasus Professor of Astronomy and Planetary Sciences at the University of Central Florida.

May 15: Dr. Brent Venable, IHMC Senior Research Scientist, director of the IHMC-UWF Ph.D. program in Intelligent Systems and Robotics at the University of West Florida.

In Ocala, the Premier Sponsor is Advent Health Ocala; Lecture Co-Host was the College of Central Florida; and Lecture Sponsor was La Casella Catering. Season Sponsors were Rasmussen University, Ocala Electric Utility, Ark Hospitality, Ocala Style, Ocala Gazette, Ocala Fiber Network, and Go52.

Science Saturdays bring lessons in photo editing, roller coasters and much more to young minds.

Science Saturdays are back and ready to heat up young scientific minds in 2025 — and now seventh-graders can join.

These 90-minute educational enrichment sessions are a cornerstone of community outreach at Florida Institute for Human and Machine Cognition (IHMC). Both the Pensacola and Ocala campuses host Science Saturdays, and have long noted the benefits these hands-on sessions bring to students.

In Pensacola, topics for the 2025 season include photo editing, roller coasters, human performance, and more. Ocala sessions include secret codes, optical illusions and environmental science. The sessions are aimed at students in grades 3-7 and are free to attend thanks to the support of community partners.

In the series' many years, nearly 5,600 students have attended and explored their interest in a wide array of science and technology topics, according to Dr. Ursula Schwuttke, director of educational outreach for IHMC.

Schwuttke made it official in 2025 to expand Science Saturdays to include seventh graders, who had previously aged out of the sessions. It was something she considered at the suggestion of parents of longtime attendees.

Students at IHMC's Ocala campus enjoyed learning about chromatography in December 2024.

Students love the hands-on nature of Science Saturdays enrichment sessions.

"At the end of last school year, I was approached by several sixth-grade students and their parents, who told me they were sad that they would no longer to be able to attend Science Saturdays," she says. "Based on their feedback, we opened Science Saturdays to seventh graders on a trial basis."

"It has been rewarding to see that almost a third of the attendees in the second session are in grade 7," she says. "It's also very satisfying that we are able provide continuing opportunity for these enthusiastic science students."

Sponsors for the 2023-2024 series in Pensacola include Premier Sponsor NextEra Energy Foundation/Florida Power & Light and Sponsors Florida Blue Foundation, the Escambia County Sheriff's Office (with Law Enforcement Trust Fund monies), and Cox.

Ocala sponsors are Lockheed Martin, Florida Blue Foundation, Cox, Eleanor and Gary Simons, Ocala Electric Utility.

Science Saturdays

Use this link to stay up to date on dates and topics for these sessions. And share the link with friends with children in grades 3-7 https://www.ihmc.us/life/science_saturdays/

Pensacola Sessions

Jan. 25: William Howell, Photo Editing.

Feb. 22: Dr. Matt Johnson, Roller Coasters.

March 22: Dr. Marcas Bamman, Faster, Stronger, Smarter.

April 19: Dr. Kevin Gluck, Reacting, Responding, and Remembering.

Ocala Sessions

Jan. 11: Mathemagic, Isaac Ishak, Vanguard High School.

Feb. 8: Secret Codes, Dr. Arash Mahyari, IHMC.

March 8: Jell-O Lens and Optics, Dr. Peter Polack, Ocala Eye.

April 5: Water and Erosion, Scott Weeks, Florida Engineering Society.

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