



FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

# ihhmc

VOLUME 9 ISSUE 2

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Dear Friends:

When IHMC's research facility in Ocala opened in 2010, we celebrated it in this newsletter as a "highly anticipated milestone" that would do much for our institute's future. That future was predicated on success in recruiting important researchers, expanding our research footprint in Florida and enhancing "our ability to support customers such as NASA and the Department of Defense."

I can report to you that Ocala's potential is being fulfilled.

In this issue we focus on an important three-year grant from the Air Force Office of Scientific Research, in the exploding field of autonomous systems, that puts IHMC at the forefront of research into autonomous machines. Senior Research Scientist David Atkinson will lead a team seeking to develop a sophisticated understanding of how humans and robotic systems can work together in a way that mirrors human social interaction. Robotic systems are becoming so smart that they don't only work for us, but also with us.

Ocala's potential is also being fulfilled in attracting researchers. In this issue we'll introduce you to two featured newcomers: Micah Clark, who at the age of 35 is a veteran of 15 years at Jet Propulsion Lab, and joins IHMC in the field of Artificial Intelligence (AI); and Adam Dalton, 31, who brings expertise in complex computer systems from a career at Kennedy Space Center.

Another featured newcomer is Dr. Brent Venable, from the University of Padova in Italy. She will apply her strong mathematics and linguistic skills to research on how preferences influence the reasoning processes of intelligent systems.

We'll also take a detour from the world of Artificial Intelligence to focus on an effort that eschews the artificial: the organic community garden at IHMC Pensacola. It provides a unique employee benefit: fresh, seasonal fruits and vegetables for employees, grown without synthetic agricultural chemicals.

We hope this newsletter will convey our continued excitement about how our growing Ocala facility is fulfilling its promise.

And who knows—maybe IHMC's future includes a robotic organic gardener who talks about how everything was better in the old days, when young robots showed their elders more respect.

Best Wishes,



Kenneth M. Ford, Director



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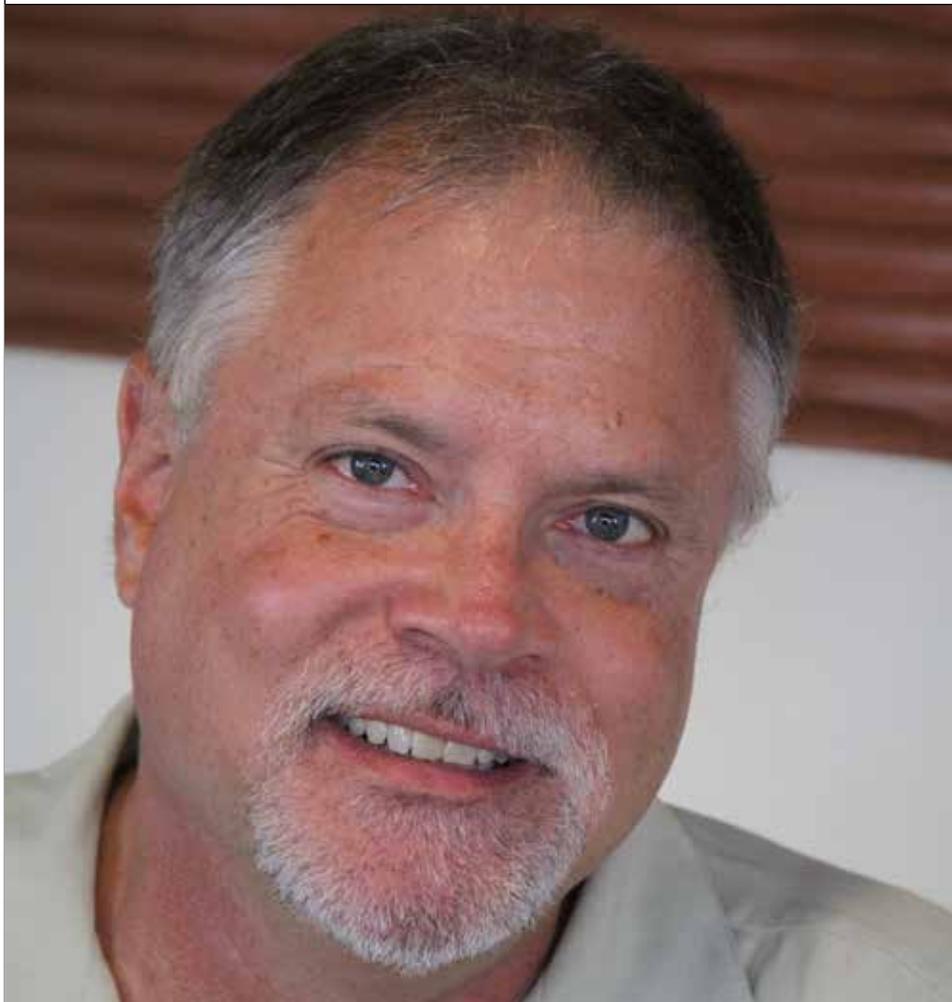
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# Robot: 'Trust me'; Human: 'Why?'



David Atkinson, senior research scientist.

*"I am putting myself to the fullest possible use, which is all I think that any conscious entity can ever hope to do" — Hal 9000, "2001: A Space Odyssey."*

Machines are getting smarter, and in the near future they could get very intelligent, very fast as machine learning improves. But can we trust such machines to perform challenging tasks that might require them to use their own judgment?

IHMC is among the world leaders in researching this question. At the institute's Ocala facility, Senior Research Scientist David Atkinson is leading a

team aimed at understanding whether the ways humans come to trust each other, through social interaction and mutual experience, can also help us judge the trustworthiness of autonomous machines.

"Can we use human ways of social interaction to work more effectively with machines?" Dr. Atkinson asks. "We interact socially with co-workers, but today we think of machines as tools, not partners."

In the future, he says, autonomous

robots might come to know us as well as our parents, our spouses or our friends. We'll socialize with them.

"As they constantly optimize their ways of interacting with us, this personalization could become very significant," he says. "They might know us better than anyone. Are you eager, or hesitant? Do you like small talk?"

This question has huge implications for developing trust in human-machine interaction across almost unlimited fields. The applications could include surgical robots, drone aircraft, computerized financial investment programs, "hands-off" automobiles, even baby-sitting robots.

Granted, this vision of socialized human-machine interaction—think astronaut Dave Bowman and the Hal 9000 from "2001: A Space Odyssey"—seems a long way off. But Dr. Atkinson has helped put IHMC at the forefront of research into autonomous machines with a three-year grant from the Air Force Office of Scientific Research, titled, "The Role of Benevolence in Trust of Autonomous Systems."

## A computer partner

Boiled down to its essence, we want to know whether computers and robotic systems, designed to think for themselves, are trustworthy—and more importantly, how will we know?

If they share our goals and we believe they are competent, this will help us trust them the way we trust other people, says Dr. Atkinson.

"At the end of the day, the primary point of importance is whether we can achieve human-machine partnership," he says.

**continued »**

**FEATURED NEWS**

“The human has to be able to rely on the machine appropriately; that is, to use it to the extent of its capabilities. So a pilot knows when to take control of the aircraft from the computer, and when to let it fly the plane.

“But (the computer) also has to know what it is capable of. Systems are most brittle at the edge of their competence; they don’t know their limits.”

**Benevolent computers?**

Dr. Atkinson says the Air Force asked him to look specifically at the question of benevolence, addressing issues such as: “Will a human attribute benevolence to an intelligent machine? How can we fine-tune the interaction based on this belief in the trustworthiness of the machine? Will people believe that the machine has a choice, or not?”

At the same time, he jokes, “I hope we don’t have to get to the point where we have to persuade machines to be helpful.”

People know how to trust other people, Dr. Atkinson says. It’s based on our beliefs about each other, on our understanding of our “social language,” including body language, and on our ability to predict how people will act and react. We trust people who we believe will act in ways we can easily anticipate.

“There are whole fields of study devoted to human trust,” he says. “But now we’re getting these increasingly smart machines that we need to interact with. We have to figure out whether these beliefs will carry over from human-human to human-machine.”

Doing so in large part means figuring out what it is the machine needs to show to humans, through language and behavior, including physical gestures, to assure them that it understands, and is capable of doing, what is required of it.

“We would like to know if a machine



David Atkinson

is confident in doing a task,” he says. “Humans give out all sorts of signs (social cues) that indicate confidence or lack of it. If the human becomes confident that the machine can do the job, he will delegate to the machine.”

So if you believe that the machine can take care of your 4-year-old child, you might be more likely to let it, just as a surgeon must be confident in the competence of the nurses and doctors who assist in an operation.

Dr. Atkinson says that today’s complex AI (artificial intelligence) machines are not certifiable by existing test methodologies. “So if you are going to use it, you are going to put it into situations where there are many unknowns. That’s not just a problem for the military. We need new ways to build trust in such systems before we can use them to full advantage.”

Meanwhile, he says, as the machines become more complex, they “will behave

in ways that we can’t predict. They are going to become very capable of deciding what to do on their own.”

Dr. Atkinson, a leading researcher on autonomous systems, says the study is an outgrowth of a meeting he convened for the Air Force Office of Scientific Research at IHMC to bring a divergent group of researchers together on the issue of trust in machines. “I realized we were all talking about the same thing, but we weren’t talking to each other.”

The study will include a survey to determine people’s attitudes and beliefs regarding trust in machines. Atkinson says it will lead to an experimental design to test how best to portray the information needed to allow people to develop a belief in machine benevolence.

“This is where it all becomes very difficult,” he says. “We have to express the machine’s internal state in a meaningful way: ‘Will it help me?’ ” 

# PROFILES Featured Researchers



## Micah Clark

**Hometown:** Pasadena, California.

**Education:** Ph.D. in cognitive science from Rensselaer Polytechnic Institute (RPI) in Troy, N.Y.; B.S. in computer science and philosophy from RPI.

**Joined IHMC:** March 2012.

“Arch criminal.” That’s Micah’s response when asked what he might have been if not a computer scientist. Why? “It’s the idea of defeating a system of rules.”

A good thing for science that he followed his better angels.

At 19, still a sophomore, Micah took a co-op position at Jet Propulsion Lab, where he stayed for the next 15 years. His work included high-profile projects like Deep Space I and Deep Impact.

That gave him roots he didn’t have as a child. He was born in Washington state, but followed his minister father (now corporate counsel for an international church denomination) to Florida, North Carolina and California. “We were pretty poor, but we didn’t know it because everyone around us was, too,” he said.

Introduced to computers by a neighbor with an Atari game console, “I was fascinated,” he

said. That led to computer games and chess against a computer that “killed me. I began wishing I could teach it to ease up, to compete at my level.”

Today, at 35, he’s driven by “the grand dream of AI and cognitive science: computers as people. AI components have been divorced from humanity; we’re trying to build ultimately rational machines that never make a mistake, machine gods that always make the most rational decisions. Of course, that’s not like people at all. I’m trying to make machines smarter in how they deal with people.”

Married to Janelle since January, he’s a diplomat as well as a scientist. For relaxation around Ocala, he said, “I want to do whatever my wife wants to do.” He also likes to cook and read.

But, he said, “I’m one of those lucky people for whom what I do for a living is also my hobby.”



## Adam Dalton

**Hometown:** Tucson, Arizona.

**Education:** Master’s in modeling and simulation from the University of Central Florida; Bachelor of science in Honours Computer Science from McGill University in Montreal.

**Joined IHMC:** May 2012.

Adam, 31, launched his professional career at Kennedy Space Center, developing workforce models for the transition away from the Shuttle program. That brought him into close contact with the engineering side, and he moved into the launch control group, working on synchronization of complex systems.

“When systems get complex enough,” he said, “you need a system to make sure it all works.”

Already looking to his future, he reached out to IHMC Director /CEO Ken Ford for career advice. “Through those conversations I determined that IHMC might be a good match,” he said.

It was. Five months later, Adam was working at IHMC Ocala. He said he likes the institute’s focus on “cutting edge” technology.

“At NASA, there’s a lot of problem-solving,” Adam said. “That’s great, but eventually you think that if you could build better tools for solving problems, that would be great, too. That’s what IHMC does.”

In Ocala he said he will focus on two main areas: cyber security, and natural language understanding.

The security project will focus on protecting mission critical systems with high visibility, such as rocket launch control or nuclear power plants, and that are vulnerable to hackers. A goal is to optimize the strengths of humans and machines in a cooperative security system.

The language project is aimed at understanding how to make the metaphors inherent in human language comprehensible to machines, again to facilitate human-machine teamwork.

He said he’s looking forward to exploring Ocala’s restaurants and the surrounding countryside with his wife, Larissa, and their newborn son, Sam.

While he hopes soon to get back to activities like reading science fiction, he doesn’t mind being consumed by work he says is fun. “It is one of the best jobs to get because we get to play at work all day.”

# High-tech eats: IHMC's garden

Employees at IHMC enjoy one of the most unique fringe benefits offered by any employer in Pensacola: a community vegetable garden.

With the Northwest Florida growing "season" extending year-round, institute employees can wander into IHMC's grassy, open back lawn almost daily to pick fruits and vegetables as they ripen, or wait to harvest the bounty after it is gathered and laid out for them in the kitchen.

And it's all organic.

"The garden is not an industrial farm—we are growing food for our own consumption and see no reason to use synthetic pesticides and chemical fertilizers," says IHMC Director/CEO Ken Ford. "The garden does beautifully without them, so why use them?"

Commercial gardener Wayne Harding does most of the work. From planting to weeding to feeding the plants with organic fertilizer and locally made compost, Harding is committed to a non-chemical approach. Water comes from an efficient drip system.

"It just seems that when we started using all these chemicals we started losing our children, with allergies, autism, all the other problems," Harding says about his commitment to organics. "They are having problems they didn't use to have."

Harding, 53, a Pennsylvania native, came to the Pensacola area in 1985 with an industrial construction firm to work on the paper mill in Cantonment. "It was a two-year job," he says. "I'm a big fisherman, and when I saw the quality of the water here, I said this is it. I brought my wife and sons, and we've been here ever since."

After the project ended, he took on similar work that left him worried "it



IHMC gardener Wayne Harding

was going to put me in an early grave." He turned to gardening, determined to embrace a healthy lifestyle.

Harding saw an opportunity to get into commercial gardening when he maintained the garden of a friend's father when the man was incapacitated by cancer. That led to Growing Gardens, a company Harding and his wife now run. "His son didn't know what to do, so I showed him. I realized there were lots of other people like him."

Several years ago, Ford's wife, Nancy, hired Harding to put in a garden in the Fords' community space in the Aragon neighborhood. That led her to suggest a garden for IHMC.

"I've never heard of anyone doing that for their employees," Harding says. "It's pretty unique."

Today employees and IHMC's chef pluck fresh, organic fruits, vegetables and herbs during the respective growing seasons. That includes tomatoes, cucumbers, squash, eggplant, peppers, broccoli, sweet potatoes, collards, kale, rosemary, potatoes, cabbage and, in the newest bed, blueberries and strawberries.

"I can pick as little or as much as I want," says IHMC chef Pat Caruso, who targets the fresh herbs and veggies for IHMC lunches and dinners. "There's no waste. And because you don't harvest everything year-round, we eat what's in season. I'm a big Swiss chard and kale person. If something I need isn't there, I notify the front desk to ask the gardener to plant it."

"The favorites here at IHMC are tomatoes in the summer and broccoli in winter," says Mike James, assistant director of IHMC. James works with Harding to decide what to plant, and oversees the harvesting of the crops.

He says the garden started with an emphasis on employees gardening in their own beds, but active travel schedules make it difficult for many. And, he says, "it sort of waned when people found out it was hot and a lot of work." Now they eagerly await James' harvesting forays.

It is hard work. Without chemical herbicides or pesticides, Harding puts in a lot of manual labor weeding with hand tools and getting rid of pests.

But it's worth it.

"I just love gardening in Florida," he says. "If you don't use chemicals it is a lot more work than you'd think. But while I'm cleaning the garden, it's cleaning me. It's pretty cool." ☆

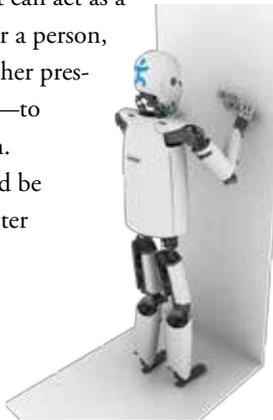


Crudité tray of vegetables from the garden and arranged by IHMC chef Pat Caruso.

## NASA delivers robotics grant

An IHMC team led by Research Scientist Dr. Jerry Pratt and Research Associate Matt Johnson has won a \$5.78 million research grant aimed at pushing the boundaries of cooperative interaction between humans and robots.

The five-year grant from NASA will focus on developing a humanoid avatar robot system that can act as a physical proxy for a person, projecting his or her presence—and skills—to a remote location. Such robots could be deployed to disaster recovery sites or even explore the surface of another planet.



The grant is one of eight advanced robotics projects awarded to researchers around the country, aimed at enhancing future NASA missions and supporting the National Robotics Initiative, a multi-agency U.S. government initiative.

IHMC's expertise and experience were key factors in winning the award. The project will push the boundaries of what humanoid robots can do, both in cooperation with human counterparts and in terms of increased autonomy.

"This project will be extremely difficult," Pratt said. "But we've been advocating exactly this type of project for over 10 years, have been thinking about what it would take, and have been working on various pieces of a solution through our other research over the years. So we were really ready when this came along."

IHMC's team will include at least 12 members, with a wide range of experience in key robotics technology. ✨

# IN RESIDENCE

## Brent Venable joins Ocala

Dr. Kristen Brent Venable, joining IHMC in Ocala as a research scientist, brings a strong linguistic background to her research in artificial intelligence (AI). She knows Italian, Latin and Ancient Greek as well as English.

She comes to IHMC from the Department of Pure and Applied Mathematics at the University of Padova in Italy, where she was a tenured assistant professor of computer science.

Brent earned a Ph.D. in computer science from the University of Padova, where she also earned a Laurea Magna cum Laude in mathematics.

In 2002, the Italian Association for Artificial Intelligence granted her its national award for "Best Thesis on Artificial Intelligence." At the university, her teaching activity has focused on fundamentals of computer science, programming languages, algorithms, data bases and AI. She also acted as a liaison between the university and NASA for research on rotorcraft.

Her research has been dedicated to providing a solid framework for the design and deployment of intelligent systems able to reason about preferences. At IHMC, Brent plans to entertain a lively collaboration with groups in different areas to develop a better understanding of the role that preferences can play in different contexts. She will also continue her



Brent Venable

collaboration inside IHMC in the context of the joint NASA project for the minimization of noise in landing trajectories for rotorcrafts.

Her long-term goal is to develop surrogates—intelligent agents—with a sophisticated understanding of an individual's preferences to be able to actually represent a person in certain tasks. For example, it could handle on-line shopping for a gift, or participate in scheduling meetings or social events. The second goal is to enable autonomous interaction among these surrogates.

Brent grew up in Dallas and Asolo, Italy. She is married and has a son.

She will hold a joint appointment with Tulane University in New Orleans as an associate professor.

# Science Advisory Council meets in Pensacola



The IHMC Science Advisory Council at the Robotics Lab in Pensacola. From left, back row: Dr. William Mularie; VADM Al Harms Jr., USN (Ret.); Dr. Scott Hubbard; Dr. Larry Lemanski; Front row: Dr. T. Dwayne McCay; Dr. Raj Reddy; Dr. Alexander Levis; Dr. Alain Rappaport.

Members of IHMC's Science Advisory Council received a wide-ranging overview of institute programs and research during a two-day meeting in Pensacola on Sept. 16 and 17. The group last met in Ocala in February 2010.

The prestigious body includes leading figures in science and technology from academia, business, government and the military. At this meeting, the Council paid tribute to Dr. David Waltz, an inaugural and remarkable member of the Council who died this past year.



David Waltz

#### *Those in attendance:*

- **Vice Admiral Al Harms Jr., USN (Ret.):** Former commander of the Naval Education and Training Command and director of naval education and training for the Chief of Naval Operations.
- **Dr. Scott Hubbard:** Professor in the Department of Aeronautics and Astronautics at Stanford University, with a focus on technology and planetary explo-

ration missions; former director of NASA Ames Research Center.

- **Dr. Larry Lemanski:** Provost and vice president for academic affairs at Texas A&M University; former vice president for research at Temple University. His background includes biomedical sciences, biology and chemistry.
- **Dr. Alexander Levis:** A professor and head of the System Architectures Laboratory of the C3I Center at George Mason University; former Chief Scientist of the U.S. Air Force.
- **Dr. T. Dwayne McCay:** Provost, chief academic officer and executive vice president at the Florida Institute of Technology, and professor of physics and space sciences.

- **Dr. William Mularie:** CEO of the nonprofit Telerwork Consortium, Inc.; former deputy director of the National Imagery and Mapping Agency for Systems and Technology, and director of the Information Systems Office, at DARPA.
- **Dr. Alain Rappaport:** Co-founder and CEO of Nudgit, Inc., an Internet company focused on intelligent choice. Former executive with the Bing Group

and Health Solutions Group with Microsoft, which acquired Medstory Inc., which Rappaport founded.

- **Dr. Raj Reddy:** Herbert Simon professor of Computer Science at Carnegie Mellon University. He was founding director of the Robotics Institute, dean of the School of Computer Science, and founding director of CMU West in Silicon Valley. Former co-chair of the President's Information Technology Advisory Committee under President Clinton and President George W. Bush.

Director/CEO Ken Ford gave an update on the institute's work, followed by a series of research briefings by IHMC researchers, including demonstrations in the Robotics Lab of the Mina lower-body exoskeleton and the FastRunner robot, led by Research Scientist Dr. Peter Neuhaus. It was followed by a "Human Interfaces to Unmanned Systems" project report, including a UAV flight demonstration, by Research Associate Matt Johnson.

The Council got a cyber security research briefing from Senior Research Scientist Jeff Bradshaw. He told the group that IHMC was "getting visibility at high levels" in the cyber security community.

Associate Director and Senior Research Scientist James Allen provided an update titled "Learning Linguistic and Commonsense Knowledge," and Research Scientist Dr. Anil Raj, MD, spoke on "Anthro-Centric Multi-Sensory Interfaces."

Council members met newly hired Research Scientists Dr. Micah Clark and Dr. Brent Venable, who both work in the IHMC Ocala facility.

Dr. Ford hosted two dinners for the group, an opening dinner Sunday evening at the Fish House restaurant and a closing dinner at the Lee House, a bed and breakfast in the Seville Historic District. ✧

# HAPPENINGS

NEWS OF IHMC

## ‘Dynamic Walking 2012’ at IHMC



IHMC Pensacola hosted 165 scientists, professors and students from across the United States and 15 other countries on May 21-24 at an annual international robotics conference.

Director/CEO Ken Ford said the conference “attracted some of the most notable robotics thinkers from all over the world.”

“Dynamic Walking 2012” was held at the Hilton on Pensacola Beach. In its seventh year, the conference provides insight into current research on the design of legged robots. Last year’s conference was in Germany; in 2010 it was held at the Massachusetts Institute of Technology.

The topics covered a broad range of robotics research, including successes and failures. It also featured a well-attended

“Having the conference on Pensacola Beach kept up the tradition of hosting it in a unique place.”

public demonstration of an international assortment of 14 robots, of varied sizes, shapes and functions, at IHMC’s downtown campus.

Conference participants included both students and professors, with a mixture of researchers studying human walking and those designing walking robots.

Dr. Jerry Pratt, a senior robotics scientist at IHMC and primary conference organizer, said the high quality of the working sessions showed in

that “nearly all of the attendees attended all of the talks.”

“Having the conference on Pensacola Beach kept up the tradition of hosting it in a unique place,” Dr. Pratt said. “Last year it was in a castle in Germany, so I was concerned that would be a tough act to follow. But lots of people told me they were glad to have it on the beach.”

The featured lecture, open to the public, was by Dr. Thomas Roberts, associate professor of ecology and evolutionary biology at Brown University. He is a leading researcher on understanding the biomechanics of how animals walk and run. The title of his talk: “The Fleet-Footed Fauna: What Animal Athletes Can Teach Us About Efficiency, Evolution, and How to Build a Better Robot.”

# HAPPENINGS

## NEWS OF IHMC



New IHMC Board Chair Glenn Sturm.

Mills is dean emeritus and professor of law at the University of Florida Frederic G. Levin College of Law, where he served as dean from 1999 to 2003. He is the founder and director of the law school's Center for Governmental Responsibility. He has taught at Cambridge and Oxford universities, and authored books, articles and reports on constitutional law, environmental issues, voting rights and ethics in government.



Alain T. Rappaport, MD.

### Glenn Sturm named chair

At the June 11 IHMC Board of Directors meeting in Pensacola, previous Vice Chair Glenn W. Sturm was named the new chair for a two-year term.

He is replacing outgoing Chair Jim Reeves, a Pensacola lawyer, former city councilman and a former member of the Florida Legislature.

Sturm is a partner in the Atlanta office of Nelson Mullins Riley & Scarborough, where he practices corporate and technology law.

He also practices securities law and focuses on representing investment banks, technology, private equity funds and emerging growth companies.

### Jon Mills joins Board

Former Florida Speaker of the House Jon Mills has joined the IHMC Board of Directors.

"We're obviously pleased to add someone as distinguished as Jon Mills to the IHMC board," said Director/CEO Ken Ford. "His list of accomplishments speaks for itself. I believe it also underscores the importance of the work IHMC is doing."



Jon Mills

An expert on constitutional issues, he has been quoted by national media such as The New York Times, National Public Radio, Fox News, CNN and The Wall Street Journal. He produced an Emmy-winning television report on the Florida Everglades.

Mills has extensive experience in state and federal courts, including before the Florida Supreme Court. He is currently counsel to Boies, Schiller & Flexner, LLP in Miami.

### Alain Rappaport joins Board

At the Sept. 10 Board of Directors meeting, Alain T. Rappaport, MD., a scientist, and Internet and software entrepreneur, was named to the IHMC

Board. He remains on the institute's Scientific Advisory Council.

Dr. Rappaport, who also holds a Ph.D., is a former Microsoft executive with an extensive, widely varied career in business, science and government. He is deeply familiar with IHMC as a member of the SAC.

"Alain Rappaport brings to IHMC's board an incredible breadth and depth of expertise and insight into some of the most complex problems facing us in computing, Artificial Intelligence and health care," said IHMC Director/CEO Ken Ford. "And his professional career track, encompassing business, academia and NASA, is a real plus."

Dr. Rappaport, who lives and works in Silicon Valley, Calif., is the co-founder and CEO of Nudgit, Inc., an Internet company focused on intelligent choice. He specializes in issues related to robotics, Artificial Intelligence (AI), health care and medicine.

Prior to holding a number of health-related executive positions with Microsoft, he created and managed Medstory, Inc., which Microsoft acquired in 2007. The company focused on

**continued »**

# HAPPENINGS

## NEWS OF IHMC

intelligent search in health and medicine.

Before that he was co-founder, president and chief scientist of Neuron Data Inc., a global leader in AI and other business-critical software.

He recently ended a two-year term on the NASA Advisory Council. He formerly served as senior advisor to the Office of the Director at NASA's Center for Excellence for Information Technology, at the Ames Research Center in Silicon Valley, focusing on Internet computing and other strategic initiatives. And he is a founding member of the Innovative Applications of Artificial Intelligence Conference (IAAI).

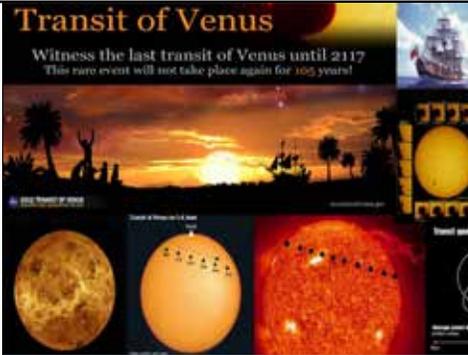
His medical degree is from René Descartes University in Paris, one of France's premier research universities; he also holds a doctorate in molecular pharmacology from the Pierre and Marie Curie University in Paris.

After completing his academic degrees, Dr. Rappaport joined the Robotics Institute at the School of Computer Science at Carnegie Mellon University as a post-doctoral fellow and adjunct member of the faculty.

### Ewers steps up as vice chair

IHMC board member Ronald Ewers was named vice chair at the June 11 Board of Directors meeting.

Ewers is president of Ewers Consulting and a part owner of Encore-Classics Fire, which builds fire-fighting equipment; Oxy Life, an Ocala oxygen supply company; and Fire Programs, a fire reporting software company. He serves on the board of the Ocala/Marion County Economic Development Council.



IHMC poster for transit viewing event.

### Public viewing: Venus

More than 50 people turned out at IHMC Pensacola on June 5 for a close-up view of an extremely rare celestial event: Venus transiting the sun.

IHMC volunteers, led by Robotics Lab Research Associate Johnny Godowski, organized the event and provided equipment, informational posters and analysis for those interested in watching Venus cross the face of the sun. Weather forced the event inside, but a link to NASA allowed viewing of a spectacular live video of the event.

Local amateur astronomer Ray Hayes brought his solar-equipped Celestron telescope, and IHMC staff built and provided a variety of safe-viewing devices that are required in taking any direct look at the sun.

The rare event has been visible only eight times since the telescope was invented in 1609. Captain James Cook's famous South Seas expedition in the late 1760s to Tahiti was primarily intended to observe the Venus transit from the Southern Hemisphere, to help determine the size of the solar system. The last transit occurred in 2004; it recurs on an eight-year cycle, followed by a gap of

more than a century. The next event won't come until 2117.

Hayes, who is also a photographer, captured images of the 2004 sunrise event from Lillian, Ala., where he lives, as the sun rose over Northwest Florida. The photos were hosted on Space.com and viewed around the world. He teaches mathematics and computer science at Virginia College in Pensacola.

## IHMC EVENING LECTURE SERIES

IHMC's Evening Lecture Series is free, open to the public and features experts who are at the top of their fields.

### PENSACOLA

**October 18: Roy Baumeister**  
*Willpower: Self-Control, Decision Fatigue, and Energy Depletion.*

**November 14: Joel Salatin**  
*Family Friendly Farming.*

**December 12: Gary Taubes**  
*Why We Get Fat: And What to Do About It.*

### OCALA

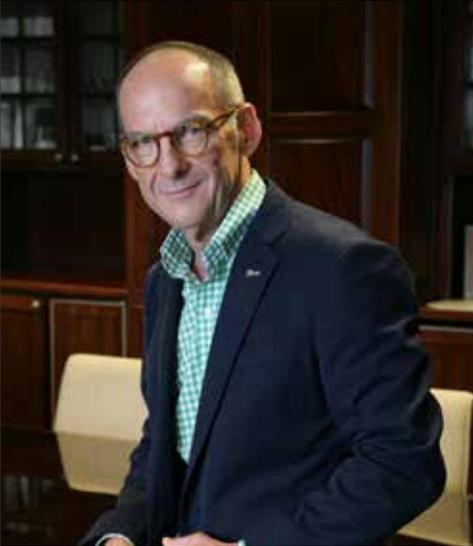
**October 31: Dr. William Davis**  
*Wheat: The UNhealthy Whole Grain.*

**November 27: Charlie Kennel**  
*NASA at mid-life: The future of human space exploration.*

**December 18: Wes Huntress**  
*Roving the Solar System: Looking for Signs of Life.*

# HAPPENINGS

## NEWS OF IHMC



Dr. Ken Ford has been named a Tulane University Outstanding Alumnus.

### Ken Ford: Outstanding Alumnus at Tulane

IHMC co-founder and Director/CEO Ken Ford was named a Tulane University Outstanding Alumnus in April, the highest form of alumni recognition given by the university. It was the Fourth Annual Alumni Awards celebration at Tulane.

Dr. Ford is the editor or co-author of hundreds of scientific papers and six books. Among many other achievements, he was asked by NASA in 1997 to develop and direct its new Center of Excellence in Information Technology at the Ames Research Center in Silicon Valley, and served as its director. In 1999, Dr. Ford was awarded the NASA Outstanding Leadership Medal. That same year, he returned to private life and IHMC.

In 2002 he earned a presidential appointment to the National Science

Board, and in 2004 was named by Florida Trend magazine as one of Florida's four most influential citizens in academia. That was followed by appointments to the Air Force Science Advisory Board; the NASA Advisory Council, where he served as chairman for three years; and in 2012 to the Defense Science Board.

In 2010, Dr. Ford was awarded NASA's highest honor: the Distinguished Public Service Medal.

Morris Marx, president emeritus of the University of West Florida in Pensacola, is himself a distinguished Tulane alumnus, earning a bachelor's, Master's and a Ph.D in mathematics from the university.

"For almost two centuries Tulane University has graduated alumni who have made important contributions to our nation. Certainly Ken Ford is at the top of this list," Marx said. "As a three-time alumnus, I take special satisfaction in this recognition of his distinguished career."

Today Marx, who served as UWF president for 14 years, is a senior research scientist at IHMC focusing on combinatorial mathematics and mathematical statistics. He is also the Trustees Professor at UWF.

Under Dr. Ford's leadership, a Tulane university release said, IHMC has become "one of the country's premier research enterprises dedicated to building technological systems to amplify and extend human cognitive and perceptive capacities."

Dr. Ford, a 1987 Ph.D in computer science from Tulane's School of Science

and Engineering, is a member of the school's advisory board and is critical to the future of computer science at Tulane, according to Nicholas Altiero, dean of the school. He said efforts by alumni experts like Ford will be crucial to the goal of expanding the school's efforts in computer science at both the graduate and undergraduate levels.

**More on Ford's award:** <http://tulane.edu/ssel/alumni/upload/2012-Science-and-Engineering-Alumni-Awards-Program.pdf>

### IHMC supports new museum for children

Midsummer saw IHMC Pensacola sponsoring the TechConnect education program, the third in an annual series, June 25-July 21. This year it focused on training high school students who staffed a downtown science museum for kids, the Pensacola MESS Hall.

The MESS Hall (Math, Engineering, Science and Stuff) was organized by IHMC Science Writer & Educational Outreach Coordinator Megan Pratt. For a small fee (\$5), she said, it provides a different experience than most museums for kids.

Rather than finding exhibits with planned outcomes, visitors to the MESS Hall get to work like real scientists, coming up with their own questions and creating experiments to learn scientific facts and, more importantly, complex reasoning.

More than 700 children visited the Mess Hall in its first month, Pratt said. "And the adults end up playing, too."

**continued »**

# HAPPENINGS

## NEWS OF IHMC



Students at work with their "MESS Kids" at Pensacola MESS Hall.

The TechConnect program provided training for 30 volunteer high school students, who help lead the younger students through the MESS Hall experience. The volunteers come from schools in both Escambia and Santa Rosa counties, including Gulf Breeze High School, West Florida High School, Pensacola High School and Pace High School. The volunteer hours help them meet community service requirements toward graduation.



Both children and adults enjoy the MESS Hall.

The student volunteers were divided into four groups, each overseeing the design, prototyping and testing of three new MESS kits (science experiments). They had four weeks to complete their concepts. They also were assigned to "work the floor" at the MESS Hall, getting hands-on experience with teaching children.

The MESS kits contain the necessary tools and components for kids to complete projects such as building circuits, isolating their own DNA or building a kaleidoscope, helping them uncover for themselves the principles of electronics, chemistry and light

In addition to working at the new museum, the high school volunteers met at IHMC on Monday afternoons to see demonstrations of robots and tour our labs. They had lunch with IHMC researchers with the idea that informal conversation with the scientists would spark a deeper interest in research.

They also participated in a Java class, introducing them to the basic concepts of

object-oriented programming. At the end of the month, they had each programmed the first level of a popular video game.

**More information:**

<http://pensacolamesshall.org/> 

## Science Saturdays

*Science Saturdays is a science enrichment program for kids in grades 3, 4 and 5 and take place at 9 a.m. and 11 a.m.*

**PENSACOLA**

**September 15-** Electronics

**October 27-** Chemistry

**November 10-** Flight

**December 8-** Cardboard Automata

**OCALA**

**September 8-** Flight

**October 6-** Jello Lenses & Lasers

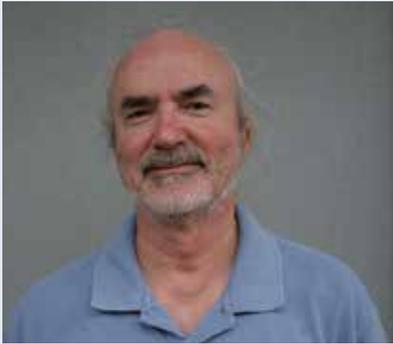
**November 3-** Paper Chromatography

**December 1-** Secret Codes

# HAPPENINGS

## NEWS OF IHMC

### NEW ARRIVALS



#### Carl Wernicke

After a 36-year career in newspaper journalism, Carl Wernicke has joined IHMC as senior writer and communications manager. His primary duty is writing the newsletter, press releases and other communications.

Carl, 59, is a Pensacola native. He worked for the Pensacola News Journal for 33 years as a reporter and editor, spending more than a decade as editorial page editor. He joined a modern journalistic trend by taking a buyout in April of this year, and joined IHMC in May.

"While at the News Journal I had long thought IHMC was an underappreciated economic asset for Pensacola," he said. "It is an amazing place filled with amazing people doing amazing things. I never thought I'd leave journalism, but I'm very happy to be working here."

Carl graduated from Pensacola's Woodham High School (now a middle school) in 1971, and earned a bachelor's in journalism from the University of Florida. He spent three years with the Mobile Press-Register before joining the then-afternoon paper, the Pensacola News, in late 1978.

As a reporter, editor and columnist Carl covered a wide range of area issues, including the Florida Legislature, local government, feature news, politics and the environment, and wrote a Sunday column for many years. He became familiar with IHMC from attending lectures and writing articles on the institute's work and on upcoming speakers in the public lecture series.

He and his wife, Patti, live on Garcon Point where they garden, raise chickens and spend way too much money on wild bird feed.

### Ocala Robotics Camp a hit

IHMC Ocala's first Summer Robotics Camp for middle school students in Marion County was a hit: Each of the three, 20-seat sessions filled quickly, prompting an extensive waiting list.

"We think it met a real need for local students interested in technology," said John "Row" Rogacki, IHMC associate director. "We're already planning next year's sessions."

The camp focused on the STEM curriculum: science, technology, engineering and math. Campers worked on robot assembly and testing, which included setting goals for their creations (such as programming a robot to navigate a maze without hitting a wall), and using STEM skills to reach them.

The sessions were made possible through the generosity of numerous sponsors and local business partners and organizations. They made it possible for 62 local students to advance their understanding of robotics through hands-on experience under the guidance of expert instruction.

The lead agency in bringing the camp to Ocala was the Florida Advanced Technological Education Center (FLATE), a National Science

Foundation-ATE Regional Center of Excellence. FLATE has helped offer summer robotics camps for more than six years in communities across Florida.

The camps have grown in popularity, size and complexity through partnering with organizations such as IHMC. FLATE and its executive director, Dr. Marilyn Barger, helped integrate the Robotics Camp with Ocala IHMC's educational outreach efforts.

The College of Central Florida provided the camp's Lego Mindstorm™ robots, and Workforce Connection provided laptop computers.

Campers also visited the Lockheed Martin Ocala Plant to gain perspective on how their miniature robotics system might work in the "real world."

The camp instructor, nationally recognized teacher Dr. Gregory Cruz, and his top assistant, Florida Tech graduate engineering student Kyle Fontaine, were critical to the campers' progress, as were local high school volunteers who guided and applauded the campers' efforts.

Mackenzie Meiers, a fifth-grade camper, summed it up best in her thank you note to sponsors: "This camp was a once-in-a-lifetime week of learning, building and excitement! It has been the thrill of my summer." ☆



Problem-solving at Ocala Robotics Camp.

# RECENT LECTURES

■■■ IHMC'S EVENING LECTURE SERIES

[www.ihmc.us/evening\\_lecture.php](http://www.ihmc.us/evening_lecture.php)



## Steve A. Mouzon

French Prime Minister Georges Clemenceau, reacting to years of European warfare, reportedly said that, "War is too important to be left to the generals." Steve Mouzon, looking at America's suburbs, argues that development is too important to be left to developers. Case in point: our unsustainable, sprawl-driven development pattern.

In his talk, "Sprawl Recovery: America's greatest place-making challenge," he said the problem with specialization is that "we don't have the authority to tell the specialists it isn't good enough." The development they oversaw created "automobile poverty," forcing us to spend too much on cars to deal with "unwalkable communities." Curing this "sprawl addiction" begins with "lovability: Sustainable buildings must be lovable, so we don't throw them away."

Mouzon, author of "Original Green," founded the New Urban Guild to push for sustainable communities.



## Thomas Roberts

Robotics, Dr. Thomas Roberts said, look to animals "as a model for robot studies." And the best are "celebrity animal athletes" like cheetahs ... and turkeys. Roberts, one of the world's top experts on animal locomotion, trains turkeys to run on treadmills to study their running ability.

"Why study animal locomotion?" Roberts asked in his talk, "The Fleet Footed Fauna: What animal studies can teach us about efficiency, evolution, and how to build a better robot." The answer: "Animal research leads to questions that, when answered, lead to new ideas. It gives us insight and inspiration" for the design of legged robots.

With a bachelor's in biology (University of Chicago) and a Ph.D. from Harvard, Dr. Roberts focuses on integrating our understanding of muscle physiology with modern approaches in functional morphology and biomechanics.



## Brother Guy Consolmagno

To advance science and human understanding, scientists can't be afraid of being wrong, says Brother Guy Consolmagno. As a result, he told an IHMC audience, they are often wrong. In astronomy, many famous pioneers reached for the stars—and almost got it right. That is, they were wrong, Consolmagno said in his lecture, "Discarded Worlds: Astronomical ideas that were almost correct."

Fortunately, there are lessons in failure. "Science makes mistakes," Consolmagno said. "But it does correct them."

Consolmagno, SJ, earned undergraduate and Masters' degrees from MIT, and a Ph.D. in planetary science from the University of Arizona. At the Vatican Observatory since 1993, his research explores connections between meteorites, asteroids and the evolution of small solar system bodies, and he curates the Vatican meteorite collection.

He is the author of a number of popular books including his latest, the new edition of "Turn Left at Orion."



## Hattie Dorsey

Hattie Dorsey told the IHMC audience that sustainable communities are built on an interconnected base of strong schools, diverse jobs, good housing and transportation systems that serve the entire community. Her talk was titled, "Growing for the future: Building a viable and sustainable community using an Equity Agenda."

In the 1970s, she said, the United States led the world in people with a high school degree; today it is 21<sup>st</sup>. But successful education can't be confined to the young, she said, because older workers need re-education to succeed in a changing economy. "I grew up understanding what was expected of me," which was to get an education, she said. But setting expectations works for communities, too.

Dorsey is the founder and former CEO of the Atlanta Neighborhood Development Alliance and former president of the National Coalition of 100 Black Women. She currently sits on the board of Smart Growth America.



## Steve Squyres

An overflow crowd turned out to hear NASA scientist Dr. Steve Squyres give an overview and update on the Mars Rover project: "Roving Mars: Spirit, Opportunity and the Exploration of the Red Planet."

Squyres showed a video of the landing of the latest rover, Curiosity, and included a photo of the Martian landscape just four hours old. The nearly decade-old rover program, he said, has provided "intriguing clues" that Mars' past was "warmer, wetter, more like Earth"—raising hopes that evidence of life might be found.

He reviewed the development and use of the Mars rovers and the excitement involved in guiding them across the surface of the Red Planet from here on Earth. The project has been, he said, "the adventure of a lifetime."

Dr. Squyres is principal investigator of the Mars Exploration Rover Mission (MER). He is the recipient of the 2004 Carl Sagan Memorial Award and the 2009 Carl Sagan Medal for Excellence in Communication in Planetary Science.



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