

financials commenting that he had reviewed 7 months of financials for the fiscal year and that all was in good shape with a 10% overall increase in new assets.

Chair Dalton thanked Director Baker and began a discussion to update the Board on the new construction. He explained that IHMC had a very well attended groundbreaking ceremony on February 3, 2023, and that while it was a chilly and windy morning, we estimate about 150 people attended. He stated that Dr. Pam Dana emceed and Dr. Ford, himself, Senator Broxson, Triumph Chair David Bear, Pensacola City Council President Delarian Wiggins, and Space Florida EVP Howard Haug all spoke and that after the ceremonial groundbreaking photo, a lovely reception was held in the classroom at Building 40. He commented that in attendance from the Board included Gene, Martha, Hal, Jim, Mort, Dick, and himself and apologized if he missed anyone. He added that the depth of support and showing from people around the state was great and should bode well for IHMC in the future.

Chair Dalton continued his update explaining that since the groundbreaking, dirt has been moving quickly and that a foundation permit has been received and pilings are being installed and should be completed in approximately ten days. He stated that the final building permit is being processed and should be received very soon. He mentioned that foundation piling caps will be formed and installed following piling completion and that the threshold inspector and materials testing of concrete is ongoing. He commented that to save monies and expedite time delays, Owner Direct Purchase items are being processed for long delivery items, including items such as the electrical switchgear and generator. He also mentioned that shop drawings for detailed items are being processed prior to fabrication adding that overall, we are happy to report that the project is currently on time with no delays identified.

Chair Dalton then asked Dr. Ford to provide his report.

Dr. Ford said good morning to the Board and thanked Chair Dalton for the opportunity to provide his report. He began his remarks discussing the new building commenting that as Chair Dalton mentioned, the groundbreaking ceremony was very nice, and the staff did a great job on its organization and execution adding that Pam Dana was an exceptional emcee as well.

He then discussed the state legislative update saying that he was pleased that we are in the Governor's budget for \$5.2 million in funding adding that we are hopeful that this will get through appropriations under Senator Broxson's leadership. He informed the Board that IHMC requested \$6.2 million and that we appreciate all of the Board's support when you see our Senator. He continued by stating that we have

also requested \$975k for repair and replacement of the 20 plus year-old HVAC units in the 40 S. Alcaniz building. He reminded the Board that this would be a long overdue deferred maintenance initiative that is greatly needed. In addition, he mentioned that the City of Pensacola is assisting IHMC with a \$2 million request for drainage, groundwater assistance and pervious paving for the new building to alleviate water retention and flooding on the Garden and Alcaniz street corridors. He added that we appreciate everyone's support of these requests when you are in Tallahassee or in meetings with our legislative delegation.

Dr. Ford then began a discussion of the federal landscape commenting that despite debt ceiling issues and top-level federal funding uncertainty, IHMC and three FY24 issue papers have been very well received on the Hill this year. He added that on a positive note, we are finally back in person on the Hill for the majority of our meetings. He mentioned that among our DC efforts we have been advocating for increased "human performance" research via the Air Force Office of Sponsored Research in support of Space Force adding that we have also been advocating for funding to the Air Force Research Lab to continue work aimed at developing novel materials and wearable devices that enable assessment and augmentation of warfighters. And he mentioned that last but not least, the IHMC team has advocated that the Office of Naval Research have funding to increase its support of ground robotics research.

Dr. Ford then turned the discussion to new team members at IHMC stating that Kevin Gluck joined IHMC as a Senior Research Scientist last week. He explained that Kevin will take a leadership role in building a basic and applied research program in computational cognitive sciences, and that he will be a contributing faculty member to the Joint UWF-IHMC Intelligent Systems and Robotics Ph.D. program and will play a prominent role in fostering collaborations in these areas with government, industry, and academia. He stated that Kevin earned a bachelor's degree in cognitive psychology from Trinity College and that he earned both a master's and a Ph.D. at Carnegie Mellon University, also in cognitive psychology. While in graduate school at Carnegie Mellon, Dr. Ford added that Kevin was awarded a training fellowship from the Air Force Research Laboratory, marking the start of his tenure as a civilian scientist with AFRL. He explained that over the subsequent 24 years, Kevin has collaborated with an array of government, industry, and academic colleagues on basic and applied research in topics ranging across spatial processing, fatigue effects on cognitive function, robust decision making, personalized learning, and human-machine teaming. He continued on by mentioning that in 2010-2011, Kevin held a visiting scientist position at the Max Planck Institute for Human Development in Berlin, Germany adding that in addition to his work as

a government scientist, Kevin also has nearly four years of private sector research and development experience. He commented that Kevin has authored more than 100 peer-reviewed publications, is an inventor on two U.S. patents, and has had a lead role in the organization and management of 14 international conferences and workshops. He ended his comments stating that Kevin is a Fellow of the Psychonomic Society and served as Chair of the Governing Board for the Cognitive Science Society.

Dr. Ford then informed the Board that Dr. Vladimir Tsukruk joined IHMC in January part-time as a Senior Research Scientist. He explained that Vlad is also the Regents Professor at Georgia Institute of Technology, where he is the director of Microanalysis Center at the School of Materials Science and Engineering. Dr. Ford stated that Vlad's research is in the field of functional nanomaterials, surfaces and interfaces, directed assembly of synthetic/natural polymers, nanostructures, and bioinspired materials and has been recognized by numerous awards, including: Regents Professorship, Sigma Chi Sustained Research Award, Outstanding Research Author Award, Humboldt Research Award, and the National Science Foundation Special Creativity Award, among others. Dr. Ford added that Vlad is an elected Fellow of American Physical Society, Materials Research Society, and American Chemical Society, and Fulbright Fellow. Continuing on, Dr. Ford stated that Vlad has authored about 540 refereed articles in archival journals, which have been cited more than 38,000 times and two books. He added that Vlad has organized 13 professional meetings and has trained about 110 graduate students and post-docs and that currently, he serves on the editorial advisory boards of six scientific journals and as an executive editor at ACS Applied Materials and Interfaces.

Dr. Ford also stated that Francesco Tassi will join IHMC as a Senior Research Associate in May 2023 to work with Dr. Robert Griffin and the robotics team. He explained that Francesco received his BSc and MSc degrees in Mechanical Engineering at Politecnico di Milano, with a focus on Robotics and Mechatronics Engineering adding that Francesco is in the final stages of completing his PhD at Politecnico di Milano, working at Istituto Italiano di Tecnologia (IIT) focused on advanced robotics and control. Dr. Ford added that before starting on his PhD, Francesco worked as a research fellow at Consiglio Nazionale delle Ricerche (CNR) in the automation and robotics division and that he developed his MSc thesis at the Jet Propulsion Laboratory in California, where he worked on the application of Model Predictive Control for the realization of a distributed space-based observatory.

Dr. Ford also stated that Cody Costello joined IHMC as a Research Associate in February 2023 working with Dr. Robert Griffin and other members of the robotics team. He mentioned that Cody has a background in time-critical electronics systems maintenance and management including comprehensive hands-on and academic expertise in complex troubleshooting, maintenance, repair, and training/supervision of team members. He added that Cody was a member of the U.S. Marine Corps with the 8th Communications Battalion, Camp Lejeune NC (26th MEU).

In addition to these permanent new colleagues, Dr. Ford informed the Board that 10 interns have started this Spring and we expect to announce many more summer interns by the June meeting.

Turning the discussion to Triumph, Dr. Ford commented that funding continues to provide valuable resources to our growing Healthspan, Resilience, and Performance research program. He explained that since receiving final grant approval, IHMC has utilized approximately \$2.6 million to purchase state of the art equipment and hire new research team members. He explained that the new personnel we are hiring with these funds continue to quickly roll into new funded research projects allowing IHMC to stretch the funds further than anticipated. He added that IHMC is currently in the process of purchasing the new NovaSeq X Plus which will be the largest, in dollars, approximately \$1.5 million, single piece of equipment IHMC has purchased with these funds. He explained that IHMC will be one of the very first labs to have the newest version of this cutting-edge technology adding that this device will allow for next generation sequencing capacity to better understand genetics, genomics, epigenetics, and RNA biology, as well as targeted high-throughput proteomics. Additionally, he explained, the system will allow for complex untargeted analyses of the metabolome, proteome, and phospho-proteome. He explained that the ability to conduct this level of research in-house will also reduce our dependency on other labs, and the associated subcontracting of awarded funding, but will also place IHMC in much higher demand for collaboration on future funded research programs. He commented that we are all very excited to receive this new device and begin tapping into its capabilities.

Dr. Ford then informed the Board that a partnership between Space Florida and the Florida Institute for Human and Machine Cognition has been quietly growing and that recently, Space Florida gave IHMC \$2 million in support of that collaboration, which includes the healthspan, resilience, and performance research pillar. He added that when IHMC's new construction is completed in the summer of 2024, Space Florida will have office space in the new facility — additional evidence of how closely the two entities intend to work together.

Dr. Ford then turned to research stating that the first quarter of each year is usually a busy time for research proposal submittals and since the last meeting we have had 3 letters of intent to submit, 3 white papers submitted, and 11 full proposals submitted for a total of over \$28 million in research funding proposed.

He also added that in addition, we have completed contracting for several research projects between our December meeting and today stating that he would briefly mention several of the newly funded projects.

He began by informing the Board that Robert Griffin had received an Army research project of \$492,100 for a new start titled *Breaching and Accessing Urban Structures with Humanoid Robots*. In this project, Dr. Ford stated that IHMC will research, develop, and demonstrate strategies for bipedal walking robots to gain access to urban structures and that research will extend and improve our humanoid mobility and autonomy algorithms while keeping an eye towards operator interaction. He mentioned that IHMC will initially use our Atlas and Valkyrie robots for this project but will soon migrate to our SquadBot next generation humanoid robot.

Dr. Ford then commented that Tim Broderick has been awarded an Air Force Research Lab project for \$200,941 titled *Assessment and Enhancement of Airman and Teams in Operational Environments*. This project, he explained, will research and develop accurate human models for sensing, assessment, and augmentation, with emphasis on the identification of fundamental mechanisms that drive performance optimization. Dr. Ford continued by explaining that the research will concentrate on identifying, sensing, and characterizing mechanisms/metrics associated with, but not limited to, stress, workload, and operator functional state and providing connections between complex behavioral and neurophysiological measures using neurological, biological, behavioral, physiological, and cognitive parameters. He added that the ability to sense these parameters is expected to also lead to other research efforts involving individual differences, personalized health, real-time biometric sensing, and the development of novel assessment and enhancement capabilities stating the data will also be used to develop, integrate, miniaturize, and validate human-centric multi-sensor suite designs.

Dr. Ford also informed the Board that Dr. Jeff Phillips has received an Air Force award for \$499,998 called *Effects of Exogenous Ketone Esters on Acid Base Homeostasis and Operator Ventilation in Tactical Aviation*. This research, he explained, proposes to validate the claim that the consumption of exogenous ketone bodies prior to a tactical aviation relevant respiration challenge will result in significantly higher ventilation volumes, ventilation rates, blood CO₂

concentrations, lower blood pH, and better cognitive performance in aviators. He mentioned that the use of ketone esters has already been shown to offer protection from hypoxia and hyperoxia, and building off that, this study proposes testing the efficacy of ketone esters at preventing hypocarbia during a tactical aviation respiration challenge in placebo-controlled crossover design.

Dr. Ford mentioned that Dr. Jeff Phillips has received a second Air Force award in the amount of \$370,042 called: *Development of the Cognitive Assessment of Aviation Performance and Evaluation*. He explained that the aim of this research proposal is to use an IHMC software agent to link Cognitive Assessment performance data to an accelerometer and automatically organize human performance data according to high-gravity (G) exposure conditions. He added that currently, performance measures require hours of data processing in which data must be manually matched to profiles, resulting in imprecision that makes it difficult to establish the efficacy of mitigation equipment and maneuvers. This research, he stated, will develop methods to graphically summarize and link performance data with the exposure profile so trainees can be debriefed on how the exposure impacted their performance across the exposure, ultimately giving research and development teams more granularity regarding how psychomotor performance changes across different phases of a high-G profile.

Dr. Ford also commented that Matt Johnson has received an award from Penn State Applied Research Laboratory in the amount of \$209,628. The overarching goal of this funding, he added, is to perform research for the creation of autonomous agents that employ multiple cognitive capabilities, including real-time problem solving, collaboration and cooperation with other agents, real-time response to unanticipated situations including context-dependent responses to operational constraints affecting the selection and performance of tasks, and experience-based learning. He stated that the long-term goal is the autonomous operation of many entities that autonomously collect information, orient their understanding, reason about the situation, and take actions that further their objectives, including communicating information across a network.

Dr. Ford also discussed a small local project with American Magic sailing team that may be of interest stating that as most know, the American Magic sailing team has taken up residence here at the Port of Pensacola. He added that a few weeks ago, IHMC entered into an agreement to support elements of their racing efforts and that while there have been multiple research areas identified where IHMC can provide value, the first effort will be to assess the American Magic Data Display and Interface Design. He explained that Matt Johnson and members of his team will

evaluate the operator needs and available data sources to assess the current system and that once the assessment is complete, the IHMC team will design a more sophisticated interface designed to help operators quickly and accurately process data and make decisions. He explained that future support may include efforts such as virtual reality simulation, controller coupling and automation, and mechatronics adding that we will keep everyone posted on what promises to be very interesting research.

Dr. Ford then turned his discussion to philanthropic efforts stating that on Thursday, January 26, 2023, IHMC held its first informative outreach event coordinated by the philanthropy team led by Carol Carlan. He explained that those invited were current donors, influencers and community leaders from across the region and the purpose was to provide a behind the scenes look at the institute. He commented that 32 participants attended two sessions with individuals as far away as Tallahassee and Atlanta in attendance. The attendees toured the Healthspan, Performance & Resilience Lab guided by Dr. Marcas Bamman, followed by a tour in the Levin Center comprised of demonstrations of IHMC's exoskeleton work led by Dr. Gwen Bryan, Human Machine Teaming by Dr. Matt Johnson, and Legged Robotics by Dr. Robert Griffin and then to complete the experience, Dr. Morley Stone and myself provided an overview of past, current, and future research directions at IHMC. He added that Dr. Brent Venable presented an update on the joint IHMC/UWF PhD program and that the sessions concluded with a lively Q&A session. He added that IHMC has received many positive comments and has had the opportunity to follow up with attendees who wish to support IHMC in areas of sponsorship and support of our expansion of Healthspace, Resilience and Performance research. He added a thank you to several of the Board members who attended including Jim Reeves and Dick Baker.

Turning to Outreach efforts, Dr. Ford commented that Spring 2023 Science Saturdays is underway in both Ocala and Pensacola. He added that we are happy to report that IHMC received a grant of \$7,500 from Florida Power and Light for Pensacola Science Saturdays and that in Ocala, Precision Sidewalk Safety is a new sponsor for Science Saturdays (\$1,500). Dr. Ford explained that this company is owned by the MacMurray family, whose sons attended and volunteered at Science Saturdays and whose older son, Perry was an intern in Pensacola for two summers.

Dr. Ford also mentioned that IHMC will be holding our annual IHMC Open House on Thursday April 6th from 3 to 8 pm in conjunction with National Robotics Week. He added that as with prior years, we will be showcasing IHMC research and expect to have great attendance and this year the focus will include robots, drones, virtual

reality, and human performance research. He added that the tours will start at 40 S. Alcaniz and end at the Levin Center. Dr. Ford also added that Robotics camp dates have been finalized for this summer with the Pensacola dates being held in early June, and the Ocala dates are the last week of June and second week of July commenting that registration will begin in late March.

Dr. Ford also commented that Stem-Talk continues to go strong with millions of downloads, and we have just released episode #149. He asked the Board to subscribe and share with others.

Dr. Ford concluded his report adding that he looks forward to seeing everyone in person at the June meeting and that he would like to take this opportunity to thank the Board for their continued support of IHMC. He then informed Chair Dalton that his report was concluded.

Dr. Dalton thanked Dr. Ford for another great report and asked Board members for any new business. Hearing none, he asked Dr. Ford to convey a warm welcome from the Board to the new employees. He wished all the Board members a wonderful remainder of the week and adjourned the meeting at 9:07 a.m. CST.

Respectfully submitted,

Julie Sheppard, Corporate Secretary