

IHMC Board of Directors
Teleconference Meeting Minutes
Monday, March 7, 2022
8:30 a.m. CST/9:30 a.m. EST
Call in Number 850-202-4498
Meeting 957-161-2688#
Passcode 533600#

Roll Call
Chair's Greetings

Chair Bill Dalton
Chair Bill Dalton

Action Items

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| 1. | Approval of December 13, 2021 Minutes | Chair Bill Dalton |
| 2. | Discussion of IHMC Financials | Director Dick Baker |
| 3. | Update on IHMC Financing Approved December 13, 2021 | Chair Bill Dalton |

Chief Executive Officer's Report

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| 1. | Research Update | Dr. Ken Ford |
| 2. | State & Federal Legislative Update | Dr. Ken Ford |

Adjournment

IHMC Chair Bill Dalton called the meeting to order at 8:30 a.m. CST. Directors in attendance included: Dick Baker, Carol Carlan, Bill Dalton, Ron Ewers, Eugene Franklin, Jon Mills, Eric Nickelsen, Mort O'Sullivan, Jay Patel, Jim Reeves, Martha Saunders, Gordon Sprague, and Glenn Sturm. Also in attendance were Ken Ford, Morley Stone, Ryan Tilley, Ronnie Armstrong, Alan Ordway, Katy Hendry and Julie Sheppard.

Chair Dalton welcomed everyone both in person and on the phone. We have two items to discuss and an update on the financing followed by Dr. Ford's report.

Chair Dalton introduced Agenda Item 1 asking for approval of the December 13, 2021 meeting minutes. Director Sprague moved approval followed by a second from Director O'Sullivan. The motion carried unanimously with no amendments.

Chair Dalton then asked Director Baker to provide an update on the IHMC Financials. Director Baker, IHMC Chair of Finance and Audit, then informed the Board that in comparing the first 7 months of the fiscal year to the previous 7 months of 2021, that IHMC's net assets had grown as had research revenues. He described the financials as both healthy and liquid. Chair Dalton thanked Director Baker for his report.

Chair Dalton then provided a quick update on the financing package proposed by SmartBank. He reminded the Board that the banking proposal from SmartBank consists of a \$30M financing package and term sheet to consolidate existing debt of approximately \$6M to pay off the existing balance owed on the Alcaniz/Levin property and another \$1.7M to pay off the balance owed on the Garden Street property and provide approximately \$22M in funding for a new IHMC human

performance research and office facility to be designed and constructed. He explained that at the current time, Escambia County does not have an easy or expedited way to do a tax-exempt bond issue so we are currently on the agenda for the Florida Development Finance Corporation (FDFC), a state entity, that provides this service statewide as the issuer and then the bonds are sold directly to SmartBank. He remarked that the required TEFRA public hearing for this is being noted for March and via an interlocal agreement the item will also be placed on Escambia's County's docket. He reminded the Board that as always with any financing there are small issues that arise to be worked out and that staff would keep everyone posted as this progresses forward.

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

Dr. Ford thanked Chair Dalton for the opportunity to provide his report and welcomed the Board members.

He began by addressing the State Legislative Update commenting that the Legislative Session is scheduled to end Friday, March 11th and adding that it has been an unusual Session with much more disagreement over the redistricting maps than anticipated. He also explained that there have also been a host of social issues with heavy debate, slowing the progress of other legislation. He remarked that the budget conference begins this week after protracted debate over the allocated top line funding amounts and that while initially there were projections that the Legislature might extend a few days beyond March 11th, at this point it appears everything will finish on time. He explained that this session IHMC's legislative priorities have been:

- Protecting the \$4.1 million recurring line item
- Request for \$1.3 million for HVAC repairs to 40 S. Alcaniz
- Request for \$1.4 million in cooperation with UWF for SCIF

Dr. Ford commented that hopefully IHMC is reaping the benefits of many years of groundwork and education and that the legislators are in a supportive posture toward IHMC. He remarked that both House and Senate are in agreement on our \$4.1 million line item at this point in the budget conference adding that this is the first time in several years that both legislative bodies have supported us at the identical level. He explained that while it is always possible for something to change between now and final passage of the budget, we appear to be in a strong position.

Dr. Ford commented that deferred maintenance funding is still being worked out in the Budget Conference process and that non-recurring monies are also in flux and are unlikely to be dealt with until later this week, after the subcommittee budgets are closed out and the Appropriations Chairs and Presiding Officers complete the budget. He explained that everything will move quickly in the next few days and through the weekend with the final deadline for the budget to be completed being tomorrow Tuesday, March 8th, so that the 72-hour cooling off deadline can be met and allow for final passage on March 11th.

Dr. Ford commented that Senator Doug Broxson has been the key legislative champion for IHMC, and we are very fortunate that IHMC's hometown Senator has a position of leadership for Senate President Simpson and will enjoy even more clout and authority under incoming Senate President Passidomo. Dr Ford asked all board members to please thank Senator Broxson on behalf of IHMC.

Dr. Ford then turned to the federal legislative front, commenting that for fiscal year (FY) 2022, IHMC anticipates continued strong bipartisan support for research. He mentioned that some of IHMC's new starts are currently tied up in the continuing resolution (CR) set to expire March 11th and adding that it is hard to predict the outcome at this time as this CR is the third that has been enacted to extend government funding as congressional appropriators continue working on a funding agreement for FY 2022, which began on October 1, 2021. He remarked that the House had passed the most recent CR on February 17th leaving three weeks to work out an agreement. Dr. Ford continued the discussion explaining that Appropriators have been locked in a months-long stalemate over an FY22 funding agreement, with Democrats pushing for significant increases to social spending programs and Republicans insisting that spending be divided equally between defense and non-defense programs. He commented that Appropriations leaders in the House and Senate reportedly reached an agreement on February 9th on a "framework" for the FY22 appropriations bill, but details of the agreement have yet to be released, even as negotiations continue and that we have fingers crossed for a resolution soon.

Dr. Ford then turned the discussion to new teammates mentioning that we have several new postings up on the web for full time positions and expect to have additional full-time new hires at our next meeting. He explained that it is also that time of year when we begin recruiting summer interns and every day we are receiving new inquiries so we expect this summer we will have numerous interesting students from high school to post-doctoral levels to tell you about.

He informed the Board that Timothy Nall has joined IHMC as a new research associate explaining that Timothy earned a bachelor's degree in Engineering Physics from the University of Oklahoma and that before joining IHMC, he worked for Boeing as an aerospace system engineer on a variety of Department of Defense platforms. Dr. Ford explained that while there, Timothy volunteered as a mentor to a FIRST Robotics team helping them reach the Championships in his second year on the team and that in his spare time, Timothy enjoys West Coast Swing Dancing and frequently travels to events and competitions and is into exotic cars and F1 racing.

Dr. Ford also mentioned that IHMC was very excited that one of our scientists working remotely from California, Toshi Miyatsu, will be relocating to Pensacola this summer with his wife. He explained that Toshi's research focuses on cognitive and technological tools that can enhance human learning, instruction, performance, and assessment and that at IHMC, Toshi is working with Drs. Peter Pirolli and Timothy Broderick on LEAP and Peerless both of which are funded by DARPA. In LEAP, he commented that Toshi serves as an onsite person in charge of experiments examining the efficacy of non-invasive brain stimulation on foreign-language acquisition and that in PEERLESS, he plays an important role on the cognitive behavioral team that conducts cutting-edge assessments for elite operator selection incorporating cognitive testing, speech and natural language processing, and machine learning-based EEG analyses.

Dr. Ford also informed the Board that the meeting of IHMC's Science Advisory Council (SAC) will occur over March 20th and 21st and adding that the SAC will be welcoming new members Jon Mogford from Texas A&M, Robbie Mandelbaum from Lockheed Martin, and Katharina McFarland, a former senior executive from the Defense and Intelligence communities. He commented that IHMC is greatly looking forward to hosting this group of prominent science and technology leaders, especially since the group did not meet in '20 due to COVID. He explained

that in addition to some of our well-established scientists and engineers, IHMC is also looking forward to showcasing impressive young new members of our technical staff including Gwen Bryan and Kaleen Lavin, presenting their work in robotics and human performance, respectively.

Dr. Ford also updated the Board on the Triumph funding stating that this funding continues to provide valuable resources to our growing Human Healthspan, Resilience, and Performance research. He informed the Board that since receiving final grant approval in late March of last year, IHMC has utilized approximately \$1.8M to purchase state-of-the-art equipment and hire new research team members. He mentioned that in addition to the cutting-edge research equipment being purchased, IHMC is also driving further interdisciplinary collaboration between human performance and powered exoskeleton research via the purchasing of new equipment for our machine shop. He explained that this new machine shop equipment will allow IHMC to make modifications, repairs, and fabrications in-house as human performance research inputs provide valuable physiological insight to the exoskeleton team.

Dr. Ford then began his research update stating that he was happy to present that we continue to be successful with new research funding and between our December meeting and today, we have been contracted for over \$7.2M in new research funding and have approximately \$2M of sponsored research projects pending or in the negotiation phase. He informed the Board that he would mention several of the new funded projects.

He began by mentioning Dr. Mark Williams, a recent hire with a background in cognitive psychology and expertise studies, who has recently been awarded \$635,037 titled Combat Marksmanship in Extremely Cold Environments: Assessing Impacts on Cognitive Functions and Developing Data-Driven Countermeasures funded by the Naval Health Research Center. Dr. Ford explained that few researchers have attempted to identify the mechanisms underpinning reduced cognitive function in cold environments. But, most if not all, military operational skills demand high levels of cognitive function and that without a better understanding of how extreme cold impacts cognitive function, a clear identification of which functions are most vulnerable to cold exposure, and deeper insights into the neural mechanisms underlying declines in performance, it is impossible to develop effective strategies to maintain optimal performance.

He stated that Dr. Morley Stone recently was awarded a \$3.6M study from USSOCOM for Strategies to Augment Ketosis — Assessment of Prophylactic Ketone Administration on Concussive Injury in the US Army Basic Airborne Course. He mentioned that as we have discussed in the past, warfighters face significant risk of mild traumatic brain injury (mTBI) from acute and repetitive impact and blast exposure and such events occur during combat-related and routine training activities (e.g., parachute jumping). He mentioned that it is now recognized that mTBI is associated with neuroinflammation and can have persistent long-term debilitating effects in many individuals and that even mild neurotrauma can lead to cognitive decline and behavioral changes and if left untreated increases risk for neuronal atrophy and acceleration of age-related neurodegeneration. He stated that there is an urgent need to develop safe and deployable treatments that attenuate mTBI in warfighters. The overarching goal of this project is to reduce the deficits induced by closed head injuries and that to meet this goal, we will test the central hypothesis that a metabolically supported ketone-fueled brain may benefit from enhanced protection from neurotrauma. He explained that IHMC will conduct a novel trial designed to assess the efficacy of

ketone ester supplementation during Army Basic Airborne Course as a prophylactic against detrimental cognitive outcomes following mTBI and this objective will be examined through three specific aims. Aim 1 is examining the pre-jump prophylactic potential of KETONE supplementation to attenuate closed head injury-induced changes in cognitive performance. Aim 2 is exploring the potential of KETONE to alter blood and urine-based protein, molecular, metabolic and lipid profiles impacted by closed head injury during jump training. And Aim 3 (Option) is developing a multidimensional predictive model of mTBI risk among BAC participants. He explained that IHMC will leverage leading-edge machine learning advanced by our team to integrate phenotypic, multiomic, and head impact data across the full cohort of BAC participants and generate a signature predictive of mTBI risk adding that this approach builds on our experience in establishing predictive models of key outcomes across multiple human subject research projects supported by SOCOM, ONR, DARPA, NIH, and VA.

Dr. Ford then discussed another recent IHMC scientist hire, Dr. Kaleen Lavin, stating that she has also received an award of \$300,000 from USSOCOM for a project called, Enhancement of Pathway-Level Information Extractor for 'Omics Data Interpretation (EPLIER). He commented that this new award builds upon PLIER, an innovative and powerful bioinformatics tool, to address several key limitations adding that the proposed solutions will reduce bias, enhance scientific rigor, and increase opportunities for validation. He mentioned that Multi-Modal PLIER will use these automated approaches while strengthening detection of differential patterns between conditions, with obvious implications for categorial comparisons including repeated measures study designs and the goal is that these enhancements will improve the ability to represent the biological and physiological relevance of gene expression-based discoveries in an efficient, unbiased, and informed manner.

Dr. Ford informed the Board that Dr. Robert Griffin has a second phase project from an Electric Car Company for \$504,170 Optimus Project V2 that will continue the work begun in the last year by further supporting humanoid robot efforts by modeling design variants of the Optimus V2 robot, simulating those models through various maneuvers of interest, improving walking algorithm robustness, and supporting the V2 robot platform. He added that Robert also has received a National Science Foundation collaborative research project with Clemson University for \$161,902, for Occupational Exoskeletons and the Human-Technology Partnership with the emphasis on Achieving Scale and Integration into the Future of Work explaining that in this effort, IHMC will be participating as a subcontractor to Clemson University, focusing on the development of an exoskeleton emulator to allow the rapid evaluation and exploration of different assistive profiles for upper-body exoskeletons, particularly focusing on the shoulder, elbow, and back. Dr. Ford also stated that Dr. Griffin has a third project funded at \$2M, as part of our collaboration with DOE's Sandia National Laboratories adding that this is a continuation of our Wearable Robotics to Enhance Worker Safety project.

Dr. Ford also stated that he was happy to discuss a project led by Peter Pirolli which has been selected for funding and is currently in negotiations with USSOCOM at roughly \$2M. He explained that as everyone can appreciate, objective and continuous measurement of cognitive readiness is important for service members, particularly in populations where traumatic brain injury (TBI) is common and under-reported, such as in special operations forces adding that service members face significant risk of mTBI from acute impacts that occur both in combat (e.g. blast

exposure) and training (e.g., parachute jumping). He mentioned a need for neurocognitive measurement tools that are efficient and engaging, given the lengthy list of cognitive and motor factors affected by TBIs and how monotonous current tests are for each factor. He added that it is also important that assessment and diagnostic instruments measure cognitive abilities and other biomarkers that are ecologically valid for the specialized demands of military operations, that may include measurements of cognitive resilience to stress or behavior in teamwork situations and that to address these challenges, IHMC will create and validate a novel game- and communication-based assessment platform called the Virtual Integrated Social Task (VISTA) system. VISTA builds upon IHMC's innovative research platform for measuring cognitive, behavioral, and teamwork aptitudes for elite warfighter selection. He explained that VISTA collects motor, speech, and cognitive data simultaneously through an engaging team-based shooting task and enabled by these rich data, VISTA technology will provide a highly accurate, one-stop assessment of operationally relevant cognitive abilities (e.g., memory, fluid intelligence, reaction time, inhibition, reasoning, etc.) that can serve in the assessment of neurocognitive and mission readiness abilities and that is responsive to mTBI-related declines. He commented that to test VISTA as a feasible tool for assessing mTBI, IHMC will evaluate the validity of VISTA against a current gold standard mTBI assessment instrument.

Dr. Ford then turned to a discussion of the Pensacola Facilities Update and Renovation Update explaining that construction is almost complete in the lower north wing of 40 S. Alcaniz St. with ceilings, casework, flooring, tile for the new shower areas, and final HVAC connections in the process of installation. He stated that final installation of freezers and fume hood should be completed early next week. He commented that this project has been more challenging and taken longer than envisioned and hopefully we are in the newly renovated space just in time for some crucial deadlines for an existing human performance research project.

Dr. Ford also mentioned that in the newly rented Reus Street warehouse, the resistance pool (Endless swim pool) has been installed, adding that there is one remaining issue with the factory control settings, and this is being resolved by the installation representative and electrician. He commented that the "cold pool" is installed and functional with decking and enclosure and that minor work is ongoing to clean up corridors for safety and esthetic reasons. He stated that the use of the additional space in the Reus Street location is being discussed and will require permitting and design professionals to provide additional lighting, additional HVAC, exhaust fans for chlorine fumes, and possibly opening of structural walls to provide adequate spans for environmental chamber and equipment located at the Andrews Institute. He explained that the feasibility of relocating this equipment will be a topic of discussion when more information has been provided and costs analyzed.

Finishing up his discussion on renovations, Dr. Ford commented that we are nearly complete in renovations at the former executive office suite on the second floor of 40 S. Alcaniz St. explaining that this space will now be used more efficiently and provide offices for many researchers and staff. He suggested that in person Board members should feel free to tour after this meeting along with the lower north renovations at building 40 adding that he thought everyone would be pleasantly surprised by the transition from the old executive suite where we used to hold our Board meetings.

Turning to the new construction update, Dr. Ford stated that IHMC had advertised for architect engineering services for the proposed new facility and that eight firms responded and 4 firms were shortlisted for presentations to the selection committee. He mentioned that those firms shortlisted included, Caldwell and Associates, DAG architects, Quina Grundhoefer Architects and Williams Blackstock Architects all came in person Friday, February 25th and made 90-minute presentations stating that those presentations included information on partners that had biomedical lab experience. He mentioned that the Selection Committee unanimously selected DAG Architects based on their excellent team and presentation commenting that DAG has partnered with Cooper Carry Science and Technology Group with national experience in designing laboratory buildings around the country. He explained that DAG and Cooper Carry have already hit the ground running and are already working with Phil Turner and Marcos Bamman on a quick turnaround floor design for an upcoming NIH research lab funding grant which is a long shot but worth submitting. He explained that the next major task will be scheduling design charettes with the IHMC building user community and the design team and we are scheduling these in the next few weeks.

Dr. Ford stated that IHMC will also be putting out a Construction Manager at Risk Request for Qualifications to quickly add a construction firm to the IHMC/DAG team to insure that the design criteria for materials are those that can be obtained in the construction period time frame such as brick, steel, concrete etc. He further explained that we are also engaged in the necessary environmental, engineering, and topographical surveys needed as the project begins to take shape adding that he believed we will have lots to report at the upcoming June meeting.

Dr. Ford mentioned that in Ocala, we have restarted the lecture series, on March 3rd with IHMC's Mark Williams and continuing through April and May we plan to host live lectures. He added that to prepare for this change, we have been "rebooting" all our media connections and sponsors, as well as making appointments with new potential sponsors for the remainder of the evening lectures for spring and fall of 2022. He mentioned that the Ocala public sculpture project with Ocala Electric Utility is now complete and in April will be the focus of the First Friday Art Walk and that Science Saturdays are also back in full swing and have had large waiting lists. Also in Ocala, he noted that these past several weeks IHMC has hosted two town hall meetings for the city regarding the proposed second downtown parking garage commenting that both meetings were very well attended, and it is nice to see people in our facility again. He stated that the Ocala facility is up to date on all maintenance, and everything is running smoothly with one air conditioning unit being replaced in early March.

Dr. Ford also commented that the Spring 2022 season of Science Saturdays is underway and events in Ocala include Engineering for Extreme Winds, Computer Game Design, Dolphins - Brainiacs of the Sea, and Sphero Robots. In Pensacola, he mentioned that the four sessions are Balloon Cars, Electric Circuits, Computer Game Sprites, and Monarch Butterflies. Computer Game Sprites and Monarch Butterflies are new topics for Pensacola this year. He stated that attendance at both locations is starting to pick up adding that we are back to having waiting lists, especially in the 9 a.m. sessions. He stated that planning for robotics camp is going well and we are ready to start registration as parents have already been inquiring and that this year, instead of having one session for rising 7th and 8th graders, and a second session for rising 8th and 9th graders, we are going to try one session for rising 8th graders and the second for rising 9th and 10th graders. He stated that Stem-Talk continues to be very successful adding that we have had well over 3 million downloads

of the 133 STEM-Talk episodes.

Dr. Ford also mentioned that the Evening lecture series has restarted at both locations and that as noted earlier, Mark Williams lectured last week at our Ocala facility and will speak here in Pensacola on March 24, 2022 at 4 p.m. discussing “expertise” and what makes one an expert.

In conclusion, Dr. Ford thanked the Board for their continued support of IHMC and stated that his report was concluded.

Chair Dalton thanked Dr. Ford for an excellent report and asked the Board if there were additional items to discuss and hearing none, he stated that the next Board meeting would be June 12th and is our annual in person with a dinner Sunday evening, June 12th followed by a one-half day meeting on Monday, June 13th. He commented that he looked forward to seeing all of you in person. He wished everyone a fabulous remainder of the week and adjourned the meeting at 9:34 a..m cst.

Respectfully submitted,
Julie Sheppard, Corporate Secretary