IHMC Board of Directors Meeting Minutes

Monday March 9, 2020
8:30 a.m. CST/9:30 a.m. EST Meeting

Roll Call	Chair Bill Dalton
Chair's Greetings	Chair Bill Dalton

Action Items

1.	Approval of December 9, 2019 Minutes	Chair Bill Dalton
2.	Discussion and Approval of IHMC Audited Financials	Chair Finance Dick Baker
3.	Review and Approval of Amendment to IHMC 403 b Tax Deferred Annuity Plan	Chair Bill Dalton

Chief Executive Officer's Report

1.	Research Update	Dr. Ken Ford
2.	State and 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, Hal Hudson, Jon Mills, Mort O'Sullivan, Jay Patel, Jim Reeves, and Martha Saunders. Also, in attendance were Ken Ford, Pam Dana, Ronnie Armstrong, Todd Norell, Katy Hendry, Ryan Tilley, Alan Ordway, and Julie Sheppard

Chair Dalton welcomed and thanked everyone who was there that morning both in person and to those who dialed in to the call. Chair Dalton then moved directly into the meeting explaining that there were three items to discuss this morning followed by Dr. Ford's report. He announced Action Item 1. The approval of the December 9, 2019 minutes. Director Carlan moved approval seconded by Director O'Sullivan. Hearing no objections, the motion carried unanimously.

Chair Dalton then turned to Agenda Item 2, the discussion of the IHMC Financials. He asked Director Baker, IHMC Chair of Finance and Audit to discuss the current IHMC financials. Director Baker thanked Chair Dalton and briefly discussed the IHMC financials noting revenues and expenses and comparing these to last years numbers. He remarked that he was extremely pleased with the financials and asked for questions. Hearing none he informed Chair Dalton that he had finished his report. Chair Dalton thanked Director Baker.

Chair Dalton then introduced Agenda Item Number 3 and explained that he would like to walk everyone through this item, the review and discussion of amendments to IHMC's 403b Tax

Deferred Annuity Plan. He explained that there were several key bullet points regarding the proposed retirement plan changes including a change that addressed the joint-hire of IHMC and UWF or other affiliated organization employees. He stated that this change allowed for the joint-hires to participate in IHMC's 403b direct contribution plan when the employees otherwise would not qualify due to FTE. Chair Dalton reminded the Board that these changes were prompted by the Joint hires with UWF in Cyber (Greg Hall) and the Ph.D. Director (Brent Venable) and that IHMC promptly addressed these joint hires to insure our plans were up to date and to allow these employees to fully participate.

Chair Dalton continued by explaining that an additional change was required brought by new IRS Guidance that all 403b plans be restated by March 31, 2020. He added that these plan amendments if approved today would bring the IHMC plan current with the March restatement.

Chair Dalton also explained that an additional change would allow all IHMC employees, regardless of FTE, to be able to voluntarily contribute to the 403b plan. He added that we believe that allowing even part time employees to voluntarily contribute is both a recruitment and retention tool and can be financially beneficial to potential applicants who may wish to join IHMC on a part time basis or for current IHMC employees who wish to reduce time below .75% FTE. He added that this covers everything about the plan and its changes.

Chair Dalton explained that these changes have been fully vetted with IHMC's retirement counsel, DJ Simonetti, and added that both Julie or Ronnie can answer other questions from the Board members. He then asked the Board if there were any questions or if any aspect of these plan amendments required additional information. Hearing no questions, a motion was made and seconded to approve the plan amendments and this motion carried unanimously.

Chair Dalton then thanked the Board and asked Dr. Ford to provide his report. Dr. Ford thanked Chair Dalton for the opportunity to provide his report and began by discussing activity on the federal front. He explained that the White House had recently unveiled the budget blueprint for fiscal year 2021 on February 10th. He explained that a schedule for markups by the House Defense Appropriations subcommittees and full committee is scheduled for March and April and the full committee is expected to approve the allocations on April 28th. He explained that House Majority Leader Steny Hoyer (D-MD) has indicated that he would like the House to pass the majority of the appropriations bills before the July 4th recess. He added that in general, thus far, this looks like a good year for Federal R&D funding explaining that NASA will receive a significant boost as will AI research across the government. He mentioned that while this appears good news, the possible future effects of the coronavirus and our national response to it are wild cards.

Dr. Ford then turned his discussion to the State Legislative update and stated that, on the State front, the Florida Legislature is also dealing with coronavirus issues. He explained that we continue to be in the Governor's Budget and House and Senate budgets for our recurring line and we continue to try to make up deficits that were lost in recurring line during the lean years. He explained that our expectations are that any progress on that front will not be made until the

final days of the budget but we continue to press hard and we appreciate all of your support for IHMC with Senators and Representatives and the Governor's staffers.

Dr. Ford then turned the discussion to research funding and explained that IHMC continue to be successful with new research funding and remarked that between our December meeting and today, we've been awarded over $7M in new funding. He added that he would describe several of the new projects. Dr. Ford explained that Chief Science Officer, Tim Broderick, will be receiving a new DARPA award via a subcontract with the Wright State Applied Research Corporation titled "Learning through Electrical Augmentation of Plasticity" (LEAP) that includes effort for multiple personnel as well as partnerships with the Air Force Research Lab and the University of Maryland to conduct a new study at the Defense Language Institute. He commented that the goal is to deliver targeted neuroplasticity training for Intelligence, Surveillance, and Reconnaissance (ISR) analysts using precision vagal nerve stimulation (VNS) and that together with cognitive and behavioral measures, coupled with analysis of genetic, epigenetic and other biomarker data, will provide insight of changes in neural plasticity and will enable development of optimized protocols for targeted neuroplasticity training in intelligence analysts. He remarked that in addition, the team will develop an integrated, predictive biomarker profile indicative of those individuals who would likely benefit most.

Dr. Ford also commented that as previously discussed, last year Tim brought in a large DARPA grant titled Peerless Operator Biologic Aptitude or PEERLESS adding that the goal of this program is to raise performance among those serving in specialized DoD roles such as special operations, and empower the warfighter by providing knowledge of their own biology to achieve performance goals. He explained that PEERLESS embodies an internationally recognized team that is uniquely positioned to develop a modular real time in vivo sensor that represents the most advanced intra-oral sensing platform yet devised. He remarked that the program is progressing very well, so much so that DARPA has awarded an additional $3M on the program for specialized hardware and equipment.

Dr. Ford then announced that Dr. Dawn Kernagis had received two new awards, each roughly $1M, since we last met as a Board. He explained that the first is an Office of Naval Research project titled "Human Glymphatic Functions in Extreme Environments" where Dawn and her team will identify how glymphatic function and associated CNS-linked immune response is affected by extreme environmental exposures. He added that the results from this research will provide seminal information on how activities common to Navy divers alter these critical physiological responses. He explained that her second new grant is also an ONR project and is titled "Development of an Underwater Oculometric Assessment Tool". He added that as part of this research, Dr. Kernagis and her team aim to develop a pressure resistant, diver mask fitted oculometric neurologic assessment tool, commenting that this tool will be tested for its ability to capture eye movement patterns associated with hypoxia and hypercapnia.

Dr. Ford also mentioned that in addition to these two new ONR awards, Dr. Kernagis will also be working with NASA to conduct research looking at the effects of exposure to elevated carbon dioxide on brain lymphatic and cognitive function.

Turning to the robotics group, Dr. Ford stated that Dr. Robert Griffin has been awarded funding from the National Science Foundation via Virginia Tech for an effort titled "Learning Environments with Advanced Robotics for Next-generation Emergency Responders" (LEARNER). He explained that the broad objective of this effort is to generate technology-based solutions that can support and augment the performance and safety of emergency response personnel. Dr. Ford announced that the Phase I of this program will significantly advance emergency response operations and training through the development and prototyping of an adaptive, personalized mixed-reality learning platform that enables integrating advanced technologies for human augmentation. In addition, the program will substantially advance the knowledge and state-of-the-art in exoskeleton control, human-robot interaction, and human-computer interaction.

Dr. Ford also commented that as discussed in the last board meeting, we have been approached by the Santa Rosa SWAT team to help them develop a drone program similar to our work with the PPD. He explained that these drones will have a carbon fiber frame to protect it from collisions and will be flyable using first person view (FPV) goggles. He added that IHMC is happy to support the law enforcement community.

Dr. Ford then remarked that Dr. Niranjan Suri has received add-on funding to continue his teams ONR support of the Exchange of Actionable Information at the Tactical Edge (EAITE) Program. He stated that the proposed effort is to take the components developed by IHMC as part of the Adaptive Middleware effort and experiment with those components as part of the Fight the Naval Force Forward (FNFF).

Dr. Ford then turned the discussion to recent Blue Sky meetings informing the Board that the first meeting, held February 25th and 26th in Pensacola was titled "Deep Space Isolation: Crew Challenges". He explained as background, that the current NASA architectures for deep space missions envision a combination of propulsion systems for taking a crew of four from the Earth-Moon system to Mars. He added that even leveraging a hybrid mix of chemical, electric and nuclear propulsion for optimal transit time to and from Mars, these missions are at least two years long, and for much of the time the crew is in the transit mode. He explained that the purpose of this Blue Sky was to better understand potential behavioral problems that might arise during long periods of relative isolation, identify potential mitigation approaches, and discuss ideas of meaningful work during deep space transits. He mentioned that in addition to himself, IHMC employees involved included: Dave Blakely, Dawn Kernagis, Anil Raj, Tom Jones, Bill Shepherd, and Adam Bruce.

Dr. Ford also remarked that a second Blue Sky meeting was held in Pensacola this past week on March 4th and 5th and its focus area was on "Human & Machine Teaming in the Context of Tactical Unmanned Systems". As background, he explained that tactical unmanned systems are an integral part of Special Operations, but are operated at a 1:1 ratio, meaning for every drone the ground force deploys, it has to provide a trained SOF Operator to pilot or observe the system. He added that the goal of the meeting was to identify a path forward toward the human operator

and the machines having a teamwork relationship more akin to that found in a high-performance human team. He explained that in addition to himself, IHMC participants included Anil Raj, Matt Johnson, Bill Shepherd, Tony Patron, and Adam Bruce.

Dr. Ford then turned to new IHMC hires announcing that IHMC had recently hired Dr. Toshiya Miyatsu as a Research Scientist in January. He mentioned that Toshi earned his Ph.D. and M.A. in Psychological and Brain Sciences from Washington University in St. Louis and his B.A. in Psychology from University of California, Los Angeles. He explained that Toshi is interested in enhancing the learning and instruction of cognitive and physical skills through incorporating technological and cognitive tools. At IHMC, Dr. Ford stated that Toshi will be working with Drs. Peter Pirolli and Timothy Broderick on Learning through Electrical Augmentation of Plasticity (LEAP) and Peerless Operator Biological Aptitude (PEERLESS) projects. While originally from Tokyo, Japan, Dr. Ford informed the Board that Toshi came to the US in 2006 and became a US citizen in 2018.

He added that Dr. Mark Evans was recently hired by Dr. Dawn Kernagis' group as a Senior Research Associate. Mark's principal research interests are in the fields of sport nutrition, exercise metabolism and physiology, specifically, on the interplay between nutrition and exercise interventions to optimize performance in team sport and endurance athletes. Dr. Ford explained that Mark's Ph.D. from Dublin City University is from the School of Human Health and Performance where he obtained his Ph.D. in Sports Nutrition and Exercise Metabolism adding that Mark also has completed a Masters in Sports Nutrition and a B.S. in Health and Human Performance Science.

Dr. Ford also announced that Dawn's group also recently hired Mark McClure, a graduate student from Ireland currently studying under Dr. Brendan Egan. He explained that Mark will be working as a Research Associate with Dawn's team adding that Mark received his Masters from Central Washington University in Integrative Human Physiology and he has a B.S. in Kinesiology from Oregon State University.

Continuing on with new hires, Dr. Ford explained that Steven Thorton, a Mechanical Engineer, recently joined IHMC as a Research Associate to work on IHMC's humanoid robot Nadia. He informed the Board that Steven received his B.S. Mechanical Engineering from the University of West Florida in 2019.

Continuing on the administrative side, Dr. Ford stated that he was very pleased to announce that IHMC recently hired Katy Hendry as Assistant Director for Sponsored Grants & Contracts. He informed the Board that Katy was a graduate of USF with a bachelor's degree in Public and Cultural Communications and a graduate of Embry-Riddle University with a master's degree in Leadership. He explained that Katy has 10 years of experience working in Research Administration and has spent the last 14 years working at both public and private universities adding that some of her areas of expertise include: grant proposal development, research administration, program design and management, research integrity, and project management. He concluded by saying how excited IHMC is that Katy is joining the IHMC team.

Dr. Ford then stated that at the more senior level, William (Bill) Shepherd has joined IHMC as a Senior Research Scientist. He explained that Bill has served as a Navy SEAL, NASA Astronaut, and Senior Government Official with NASA and DoD adding that Shepherd flew as a NASA Mission Specialist and Flight Engineer on 3 Space Shuttle flights. He informed the Board that in 1993, Shepherd was selected to serve as Program Manager for the new ISS leading a 16-nation partnership to design and build it and that in 1996, Shepherd was named by V.P. Gore and Russian Premier Chernomyrdin to command the "First Expedition" to the ISS. He explained that Shepherd returned to the Navy in 2001 to serve as technical advisor to the Navy's SEAL headquarters, and later was the first "Science Advisor" for USSOCOM. He commented that Bill received a B.S. in Aerospace Engineering from the Naval Academy, and M.S. in Mechanical and Ocean Engineering from MIT adding that Bill has received NASA's Steve Thorne Aviation Award, the Spirit of St. Louis Medal, and was designated "Honorary Naval Aviator #30" by the CNO. Dr. Ford continued on and mentioned that Bill has also received the Defense Distinguished Service Medal, the National Intelligence Medal, the Gagarin Gold Medal, the Robert H. Goddard Trophy, and the Congressional Space Medal of Honor and that in 2009, the ISS Program, which Capt. Shepherd led, won the Collier Trophy, recognizing the Nation's greatest achievements in aviation and astronautics. He concluded his comments stating how pleased IHMC is to welcome Bill to the family.

Dr. Ford then turned to education and outreach mentioning that this is the time of the year that we begin hiring student interns for the summer at the undergraduate, masters and Ph.D. level and explaining that he looks forward to introducing the Board to the new IHMC interns at the June meeting.

He then discussed that evening lecture series explaining that there is a great spring 2020 lineup in Pensacola which began on January 30th when Dr. Alex Garbino discussed "Pushing the Limits in Space Medicine". He explained that Alejandro "Alex" Garbino is a part time Research Scientist at IHMC, an Attending Physician in Emergency Medicine at UC Health in Denver, and an EVA Research Scientist at NASA JSC adding that Alex has extensive experience practicing medicine in challenging environments and his work focuses on physiological responses to such environments, including research on dive medicine, oxygen toxicity and space suit injury management.

Dr. Ford remarked that on February 27th, IHMC hosted Dr. Tommy Wood, a UK-trained M.D. with a Ph.D. in physiology and neuroscience adding that Tommy's work has focused on developing therapies for brain injury in new born infants and in his talk, he discussed the development of the brain and provided advice for health aging to a sold-out audience.

Continuing on with Pensacola, Dr. Ford mentioned that on March 12th, IHMC will host Dr. Jennifer Gresham explaining that Jennifer helps people escape unfulfilling careers and discover the work that makes them come alive. He added that she is the founder of the No Regrets Career Academy, and author of the popular career blog, Everyday Bright. Dr. Ford continuing by stating that after graduating from the U.S. Air Force Academy, Jennifer earned her Ph.D. in biochemistry and served as an Air Force officer for 16 years and that now, as a writer and coach, Jennifer inspires thousands of professionals around the world to find the clarity and courage they need to pursue

deeply, meaningful work. He mentioned that her advice has been featured in Forbes as well as on many of the top personal development blogs, including Zen Habits, named by Time Magazine as one of the Top 25 blogs on the Internet in 2010. He stated that Jen's talk will focus on The Modern Mismatch: Why Employers Can't Find Talent and the Talented Can't Find Good Jobs.

Dr. Ford continued by mentioning that in Pensacola on April 2nd, IHMC will host Dr. Robert Grubbs who will discuss "Translating Academic Research into Commercial Products". He explained that Robert Grubbs is the Victor and Elizabeth Atkins Professor of Chemistry at the California Institute of Technology and that he received his B.S. and M.S. in Chemistry from the University of Florida and his Ph.D. from Columbia. Dr. Ford explained that Grubbs' group discovers new catalysts and studies their fundamental chemistry and applications and he has been involved in the translation of technology through the founding of five companies. He mentioned that Dr. Grubbs received the Nobel Prize in Chemistry in 2005 and he has 655+ publications and 160+ patents based on his research.

Dr. Ford then stated that April 23rd in Pensacola will feature a repeat speaker, Dr. William Davis. He explained that Bill is a Milwaukee-based American cardiologist, low-carbohydrate diet advocate and author of health books known for his stance against "modern wheat", which he labels a "perfect, chronic poison." He explained that the Board may recall his popular book, "Wheat Belly" adding that in Bill's April lecture, he will discuss "Bowels Gone Wild: Microbiome Strategies for Age Reversal".

Dr. Ford then remarked that Pensacola concludes its season on May 21st with Dr. Brian Keating explaining that Brian is the Distinguished Professor of Physics at the Center for Astrophysics & Space Sciences in the Department of Physics at University of California, San Diego. He commented that Dr. Keating is the author of the book, "Losing the Nobel Prize".

Turning to the Spring Ocala Evening Lectures, Dr. Ford stated that on January 23rd, Dr. Brendan Egan, who is at IHMC this year on a sabbatical from Dunlin City University, gave a talk to a large Ocala audience on "Muscling in on Healthy Aging". He remarked that Brendan is an Associate Professor of Sport and Exercise Physiology at Dublin City University, and is well known for research that shows resistance training can improve strength, muscle mass, reduce falls in older people, and perhaps even extend lifespans. Dr. Ford stated that in addition to being a first-class researcher, Brendan is also a stand-out player in Ireland's national sport, Gaelic football.

Continuing on, Dr. Ford commented that on February 6th, Jennifer Gresham gave a talk in Ocala on "Learning to Learn - Rethinking Education in an Age of Complexity".

He added that on March 24, 2020, IHMC-Ocala will host Todd White who will discuss "The Dirty Secrets of the Wine Industry". He explained that Todd is a serial entrepreneur and creator since he was age 17. Today, after 15 years in the wine business his life is dedicated to educating and helping people make better choices about food, nutrition, and how they think about consuming alcohol. Dr. Ford informed the Board that Todd is the founder of Dry Farm Wines; a writer, speaker, and a leading authority on healthy organic/natural wines and the importance of micro-

dosing alcohol for health, longevity, and vitality. He explained that Todd's passion is unlocking the best way to enjoy alcohol, how to enjoy the benefits of moderate consumption while avoiding the negative outcomes.

Continuing on, Dr. Ford explained that on April 16th, IHMC-Ocala will feature John Dunn and his lecture "Why is Florida, America's Wettest State, Running Out of Water". He commented that in his new book, "Drying Up, the Fresh Water Crisis in Florida", John offers a wake-up call and a hard look at Florida's water future by noting that drainage projects, runaway sprawl, urbanization, pollution, failing infrastructure, toxic algal blooms, sea level rise, and unsustainable groundwater pumping are all taking a toll. He remarked that drawing on more than one hundred interviews and years of research, John affirms there won't be enough water for humans and the natural world, if "business as usual" prevails and added that John has published over 350 articles in a wide range of periodicals.

Dr. Ford commented that IHMC-Ocala will wrap up its spring lectures on May 19th with Stuart Hoffman explaining that Dr. Hoffman is the point of contact for the VA's Office of R&D on TBI research. Dr. Ford explained that in this role, Dr. Hoffman has oversight for two VA TBI Centers and is the co-chair of the Committee for the VA/DoD Chronic Effects of Neurotrauma Consortium. He continued on noting that Dr. Hoffman is also the VA TBI subject matter expert for the National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families. He mentioned that Dr. Hoffman serves on several intra- and interagency advisory committees for the VA and DoD, including the Congressionally-mandated TBI Advisory Committee for the Veterans Health Administration and that in addition, Dr. Hoffman is the VA representative on the Institute of Medicine's Forum on Neuroscience and Nervous System Disorders.

Dr. Ford remarked that he hoped that many of the Board members would join IHMC at one or more of these spring lectures and that as always please let him know if anyone would like to attend the sponsor's dinner following the lecture.

Turning to Science Saturdays for the Spring, Dr. Ford mentioned that IHMC is well underway in both Ocala and Pensacola. He noted that in Ocala, we have already hosted "Bridges" with Scott Weeks and "Reaction Time" with Dr. Manal Fakhoury and that in Pensacola, January was "Exploring our Watershed" with Ann Laurenzi from the Navarre Beach Marine Station and in February we hosted "Secret Codes" with Doug Stephen, a robotics researcher. He mentioned that approximately 30 students from grades 3 to 6 attended in each time slot.

He explained that the remaining Ocala presentations will be "Electric Circuits" by Dr. Arash Mayari and "Jello Lenses and Lasers "by Dr. Peter Polack and that in Pensacola, we will be offering "Programming Robots" by Dr. Lakshmi Prayaga of UWF, and "Robot Hands" by Dr. Jerry Pratt.

Dr. Ford then turned the topic to STEM-Talk, explaining that this IHMC podcast continues to be a remarkably successful outreach effort with more than 2M listeners adding that IHMC will be

releasing episode 104 shortly and so far, we have exceeded our expectations, winning several major awards for a science podcasting.

Dr. Ford stated that the summer robotics camps are in the planning process and the dates and fliers have been finalized for both locations with registration to begin in late March.

Dr. Ford also mentioned outreach activities and noted that IHMC-Ocala has hosted a number of community non-profit events; including Leadership Ocala and Leadership Florida.

Turning the conversation to facilities, Dr. Ford explained that with regard to Ocala's first-floor water incursion issues, a large industrial grinder pump, provided by the City (a donation of approximately $60k) had been installed and that we were confident that barring catastrophic flooding, we will not have any more issues with the city stormwater sewage. He stated that in Pensacola, we are looking at long overdue renovations to our building at 40 S. Alcaniz St. and that we are currently receiving bids for pressure washing and exterior paint, fence restoration and exterior walkway renovations. He stated that hopefully this spring should see a new exterior shine and then we will look at upgrades to the second floor as it is more than past time for carpeting, painting, acoustic tile replacements in these offices and common areas.

Dr. Ford then wrapped up his report, wishing all of the Board a great spring and thanking all of the Directors for their continued support, guidance, and contributions to IHMC. He informed Chair Dalton that he had concluded his report.

Chair Dalton thanked Dr. Ford for another excellent report and asked the Board if there were any questions or items to come before the Board. Hearing none, he explained that the next Board meeting is our annual June meeting and this is scheduled for dinner Sunday evening, June 14th followed by a half day meeting Monday, June 15th in Pensacola. He explained that we will be in touch with details on dinner locations and accommodations for our out of town Board members as we get closer. He also stated that between now and June we will be in touch with updates from the legislative session.

Dr. Dalton then extended his wishes to the Board for everyone to stay healthy and adjourned the Board meeting at 9:40 am CST.

Respectfully submitted,

Julie Sheppard
Corporate Secretary