**Dr. Dave Williams**, OC, OOnt, MSc, MD, CM, FCFP, FRCP LLC (Hon), DSc (Hon) is currently the President and CEO at LEAP Biosystems, President and CEO at Exploration Inc., author and a retired CSA astronaut. He was a mission specialist on STS-90 (Columbia) in 1998 and STS-118 (Endeavour) flown to the International Space Station in 2007. The only non-American who held the position of Director of the Space and Life Sciences Directorate at JSC/NASA and Deputy Associate Administrator of the Office of Spaceflight at NASA HQ (1998-2002).

**Dr. Oleg Kotov**, MD is a Deputy Director for Research at Institute for Bio-Medical Problems of Russian Academy of Science (IBMP RAN) and inactive cosmonaut flown on the International Space Station (ISS) program. He was a Flight Engineer (Expedition 15, Expedition 22, Expedition 37) and Commander aboard the ISS (Expedition 23, Expedition 38).

**Dr. Dana Levin**, MD, MPH, FACEP, FASMA is the Systems Engineering and Integration Physician for the Exploration Medical Capability Element of NASA’s Human Research Program and a Flight Surgeon in the Commercial Crew Program. He is also an Assistant Professor of Emergency Medicine at Columbia University Medical Center, and Faculty at the University of Colorado Anschutz Medical Campus where he co-founded a program to cross train physicians and engineers. He has supported research expeditions in the Himalayas, Mount Kilimanjaro, Antarctica, and the Southwest United States, as well as underwater excavations for the Institute for Nautical Archeology, and research vessels for the NSF’s UNOLS Program.

**Dr. Carolyn McGregor**, PhD is the Research Chair in Artificial Intelligence for Health and Wellness and a two-time Canada Research Chair in Health Informatics at Ontario Tech University. She is the Founding Director of the Joint Research Centre in Artificial Intelligence for Health and Wellness between Ontario Tech University and University of Technology, Sydney. She has led pioneering research in Big Data analytics, artificial intelligence, deep learning, internet of things, temporal data mining and cloud computing.

**Dr. Sandeep Gulati**, PhD is currently Founder and CEO of Zyo Inc. focused on non-invasive health sensors in wearable format. 12 years at NASA JPL as the Manager and Principal Scientist of Ultra Computing technologies working on advanced algorithm development for sensor fusion and high-performance computing including machine learning, neural networks and quantum computing.

**Dr. Sonny Kohli**, MD, FRCPC is a Critical Care Physician and Faculty at McMaster University. He is also Co-founder of Cloud DX, the Recipient of the “Bold, Epic, Innovator award” in the Qualcomm Tricorder XPRIZE competition, Faculty at Singularity University, and an ISU alumnus. He also helped deploy the IRIS study on the ISS with Dr. Robert Thirs, and was a top 40 candidate in the 2009 CSA Astronaut recruitment campaign.


Panel Moderator

"We can't resolve problems by using the same kind of thinking we used when we created them." -- Albert Einstein
The Panel Discussion

"We can’t resolve problems by using the same kind of thinking we used when we created them." -- Albert Einstein

1) Bridging the Prognostics and Health Management (PHM) to Human Health and Performance (HH&P) on the ISS program and beyond. Opportunities and constraints to validate the “PHM for Astronauts” concept.

2) The paradigm shift from telemedicine to HH&P autonomy. The HH&P autonomy (both crew-wise and individual-wise) vs conventional space medicine:

   The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health
   The Patient Will See You Now: The Future of Medicine is in Your Hands
   Deep Medicine: How AI can make healthcare human again


   Table 4. "HH&P technology candidates" of NASA Roadmap (April 2012)
   vs
   “Example Technologies” from TX06.3.1-TX06.3.7 of 2020 NASA Technology Taxonomy (page 71-74) and Table 12 of NASA Roadmap (July 2015).
   Comments and suggestions.

4) Bio-Monitor (a.k.a. Astroskin / Hexoskin) wearable:
   An advanced technology or another telemedicine-based replica?