## The COVID-19 HPC Consortium:

## A Model for Advanced Computing in Crisis Response

*By Dr. John Towns & Dr. Jim Brase*

*With High-Level Panel of Leaders in Science, Technology, On-the-Ground Action, and Policy*

Monday, August 2, 2021 | 11 AM to 1 PM EST (2 hours in duration)

### For *Remote Participation*, please register **HERE**

**ABSTRACT:**  The anchor presentation of this webinar will focus on the establishment and operation of the COVID-19 HPC Consortium.  This effort has been an unprecedented public-private partnership spanning academia, government and the corporate sector.  The Consortium has enabled over 100 research teams in responding the COVID-19 pandemic and produced scores of publications, models, data collections, tools, and other resources. The Consortium has both supported and informed the national and international response to the COVID-19 pandemic.  The experience suggests a model for domestic and global collaboration in response to crises.  We will also explore broader issues that this experience points to that could be taken up to improve the efficiency and effectiveness of the national research complex in responding to natural and man-made crises as well as to address the need to enable innovation and high-risk, high reward research. Co-chaired by Prof. Laurette Dubé (MCCHE) and Dr. Shawn Brown (PSC), the high-level panel of academic and action leaders that will follow will advance research and action in digital, physical and human collaborative in development in the bio/health/health system and bio/agriculture/food domains through a modular portfolio of projects anchored in open science and innovation, with interfaces with public and private value creation systems

**John Towns** holds two appointments at the University of Illinois at Urbana-Champaign. He is the Executive Associate Director for Engagement at NCSA (the National Center for Supercomputing Applications, http://www.ncsa.illinois.edu), and Deputy CIO for Research IT (http://researchit.illinois.edu) in the Office of the CIO at Illinois.  He is also PI and Project Director for the NSF-funded XSEDE project (the Extreme Science and Engineering Discovery Environment, http://XSEDE.org). Towns provides leadership and direction in the development, deployment and operation of advanced computing resources and services in support of a broad range of research activities. In addition, he is the founding Chair of the Steering Committee of PEARC (Practice and Experience in Advanced Research Computing, http://www.pearc.org). He earned M.S. degrees in Physics and Astronomy from the University of Illinois and a B.S. in Physics from the University of Missouri-Rolla.

**Jim Brase** is the Deputy Associate Director for Computing at Lawrence Livermore National Laboratory (LLNL). He leads LLNL research in the application of high-performance computing, large-scale data science, and simulation to a broad range of national security and science missions. Jim is co-lead of the ATOM Consortium for computational acceleration of drug discovery and on the leadership team of the COVID-19 HPC Consortium. Jim's research interests focus on the intersection of machine learning, simulation, and high-performance computing. He is currently leading efforts large-scale computing for life science, biosecurity and nuclear security applications. In his previous position as LLNL's Deputy Program Director for Intelligence Jim led efforts in intelligence and cybersecurity R&D. He was formerly LLNL's Division Leader for Optical Sciences and led programs in laser and imaging research at LLNL.

**About the series:** The precision convergence series is launched to catalyze unique synergy between, on the one hand, novel partnerships across sciences, sectors and jurisdictions around targeted domains of real-world solutions,  and on the other hand, a next generation convergence of AI with advanced research computing and other data and digital architectures such as PSC's Bridges-2, and supporting data sharing frameworks such as HuBMAP, informing in a real time as possible the design, deployment and monitoring of solutions for adaptive real-world behavior and context.

**The McGill Centre for the Convergence of Health and Economics (MCCHE)**  is a virtual world network of scientist, action and policy leaders promoting the weaving of digital-powered interdisciplinary science into person-centered  domain-specific solutions at scale to global challenges faced by traditional and modern economy and society worldwide. The MCCHE stimulates lasting collaborations that bridge the many divides in the market, economy, and society that are at the root of these most pressing modern challenges through collaborative of modular convergence innovation platforms.

**The Pittsburgh Supercomputing Center** is a joint computational research center between Carnegie Mellon University and the University of Pittsburgh. Established in 1986, PSC is supported by several federal agencies, the Commonwealth of Pennsylvania and private industry. PSC provides university, government, and industrial researchers with access to several of the most powerful systems for high-performance computing, communications, and data-handling available to scientists and engineers nationwide for unclassified research. PSC advances the state-of-the-art in high-performance computing, communications and informatics and offers a flexible environment for solving the largest and most challenging problems in computational science.

## Co-Chairs:

**Laurette Dubé, PhD** is the founding Chair and Scientific Director of the McGill Centre for the Convergence of Health Economics. She holds the James McGill Chair of Consumer and Lifestyle Psychology and Marketing. Her work has been published in top disciplinary journals in Psychology, Management and Medicine as well as in multidisciplinary journals. She holds an MBA in finance, and a PhD in behavioural decision making and consumer psychology. During her 2020-2021 sabbatical, she is a visiting scholar at the National Research Council of Canada and at the Pittsburgh Supercomputing Center, Carnegie Mellon, USA. https://thefutureeconomy.ca/interviews/laurette-dube

**Shawn Brown, PhD** is Vice Chancellor for Research Computing at the University of Pittsburgh and the Director of Pittsburgh Supercomputing Center at the Carnegie Mellon University/University of Pittsburgh and. Prior to his appointment, Dr. Brown served as the Associate Director of Research Software Development at the McGill Centre of Integrative Neuroscience at the McGill Neurological Institute. Dr. Brown is an expert on high - performance computing and computational simulation. He has over 25 years of experience in developing software to support the use of high-performance computing for research in areas such as chemistry, bioinformatics, and public health. his research interests are ALSO in how agent-based modeling and other computational techniques can be used to provide decision support in public health and chronic disease.

## Panelists:

**Michael Rosenfield, PhD** is Vice President of Strategic Partnerships at the IBM Research Division in Yorktown Heights, NY. Previously, he was Vice President of Data Centric Solutions. His current focus areas include future computing architectures, accelerated discovery, and developing new collaborations such as the COVID-19 High Performance Computing Consortium and the Hartree National Centre for Digital Innovation. Prior work in Data Centric Solutions included current and future system and processor architecture and design including CORAL and Exascale systems, system software, workflow performance analysis, the convergence of Big Data, AI, Analytics, Modeling, and Simulation, and the use of these advanced systems to solve real-world problems as part of the collaboration with the Science and Technology Facility Council's Hartree Centre in the UK. Mike has held several other Executive level positions in IBM Research including Director Smarter Energy, Director of VLSI Systems, and Director of the IBM Austin Research Lab. He started his career at IBM working on electron-beam lithography modeling and proximity correction techniques. He has a BS in Physics from the University of Vermont and a MS and Ph.D from the University of California, Berkeley.

**David Sarley** is a Senior Program Officer and impact investor with the BMGF. He works on innovations to strengthen primary health care including boosting vaccines coverage and equity. He is supporting Covid-19 work at the global and local level. He manages Grand Challenges Exploration for Vaccines Delivery and the Global Delivery Program (GDP). Some of the key investments he manages include Zipline, Macro-Eyes, Kasha and the African Resource Center for Supply Chain. He was part of the Gavi Alliance Vaccine Product Innovation Strategy execution support and was Chair of WHO's Immunization Agenda 2030 Innovation Working Group. Prior to the Foundation worked in public health supply chain consulting with John Snow Inc. and economics policy modeling with Maxwell Stamp. He has worked in over 80 countries, managing and implementing long and short term investment, supply chain and economic development projects in Philanthropy, NGO, private consulting, manufacturing and for Government. Currently volunteering and a Board member with Restart Partners supporting US communities manage their COVID-19 response.

**Ertharin Cousin** is a graduate from the University of Illinois at Chicago and the University of Georgia Law School. She has more than 25 years of national and international non-profit, government and corporate leadership experience focusing on hunger, food and resilience strategies. Cousin served as White House Liaison to the State Department, and concurrently, appointed to the Board for International Food and Agricultural Development, and Executive Vice-President and Chief Operating Officer, Feeding America. 2009, nominated and confirmed as the US Ambassador to the UN Agencies for Food and Agriculture, and head of the US Mission in Rome. From 2012 to 2017, she served as the twelfth Executive Director, United Nations World Food Programme, guiding it in meeting urgent food needs while championing longer-term solutions to food insecurity and hunger. Ambassador Ertharin Cousin currently directs the Food Systems for the Future enterprise and is a Payne Distinguished Lecturer, Spogli Institute for the Study of International Relations and Distinguished Fellow, Center on Food Security and the Environment, at Stanford University. Cousin ravels extensively to raise awareness of food insecurity and chronic malnutrition.

**Imed Gallouzi, PhD** is a Professor in Molecular and Cellular Biology and Associate Chair (education) Biochemistry Department, Faculty of Medicine and Health Sciences, McGill University, Montreal, Canada. He is also a full member of McGill Goodman Cancer Center. He recently took the Associate Director position of the Smart-Health Initiative at KAUST (King Abdullah University of Sciences and Technology), Thuwal, Saudi Arabia. He received his Ph.D. in 1998 in Molecular Biology from University Montpellier II, France. He did his postdoctoral training from 1998 to 2001 at Yale University under the supervision of Prof. Joan Steitz. During his tenure at McGill University, Prof. Gallouzi provided valuable service to the academic community, by holding several key administrative positions locally and internationally. He chaired the Graduate Advisory Committee of the Biochemistry Department at McGill University from 2008 to 2014. In 2019 he was appointed as the associate chair of the Biochemistry Department and was appointed as the academic coordinator for the establishment of a new Pre-Med program in French, that McGill University was tasked to implement by the Quebec Government. He is a full panel member of several national and international funding agencies such as CIHR, CCSRI, FRSQ and NIH. Prof. Gallouzi's research on mRNA biology and its impact on cellular adaptation to stressful and pathological conditions has led to several key contributions in the field. Recently, he made significant contributions to the field of cancer cachexia-mediated muscle wasting by uncovering novel ways to treat and interfere with this deadly syndrome. Prof. Gallouzi is also interested delineating the role of mRNA regulatory mechanisms in aging.

**Christopher Ragan, PhD** is the founding Director of McGill University's Max Bell School of Public Policy and is an Associate Professor in McGill's Department of Economics. Ragan was the Chair of Canada's Ecofiscal Commission, which launched in November 2014 with a 5-year horizon to identify policy options to improve environmental and economic performance in Canada. He was also a member of the federal finance minister's Advisory Council on Economic Growth. Chris Ragan's published research focuses mostly on the conduct of macroeconomic policy. His 2004 book, co-edited with William Watson, is called *Is the Debt War Over?* In 2007 he published *A Canadian Priorities Agenda*, co-edited with Jeremy Leonard and France St-Hilaire from the Institute for Research on Public Policy. The Ecofiscal Commission's *The Way Forward* (2015) was awarded the prestigious Doug Purvis Memorial Prize for the best work in Canadian economic policy. Ragan is an enthusiastic teacher and public communicator. In 2007 he was awarded the Noel Fieldhouse teaching prize at McGill. He is the author of *Economics* (formerly co-authored with Richard Lipsey), which after sixteen editions is still the most widely used introductory economics textbook in Canada. Ragan also writes frequent columns for newspapers, most often in *The Globe and Mail*. He teaches in several MBA and Executive MBA programs, including at McGill, EDHEC in France, and in special courses offered by McKinsey & Company. He gives dozens of public speeches every year. Ragan received his B.A. (Honours) in economics in 1984 from the University of Victoria and his M.A. in economics from Queen's University in 1985. He then moved to Cambridge, Massachusetts where he completed his Ph.D. in economics at M.I.T. in 1989. See his McGill website for downloads of his published research as well as his op-ed columns: https://mcgill.ca/economics/christopher-t-s-ragan.

**Jan Bjaalie, MD, PhD**, is professor and leader of the Neural Systemslaboratory at the Institute of Basic Medical Sciences, University of Oslo,and Head of the Norwegian Neuroinformatics Node. In the EU HumanBrain Project (HBP), he has been Leader of the NeuroinformaticsPlatform (2017 - 2020), Infrastructure Director (2018 - ), and EBRAINSData services leader (2020 -). He is also Vice-Chair of the HBPScience and Infrastructure Board. Jan Bjaalie served as Head of theInstitute of Basic Medical Sciences, University of Oslo (2009-2016),founding Executive Director of the International NeuroinformaticsCoordinating Facility – INCF (2006-2008), Chair of the INCF GoverningBoard (2013-2016), and co-Chair (2019-2020) and Chair (2021) of theInternational Brain Initiative. His research group has studied sensorymap transformations and wiring patterns in the brain and developed data systems for organizing andmanaging neuroscience research data with the use of a new generation of digital brain atlases. The groupdevelops software and workflows for data analysis, integration of heterogeneous data in atlases, and toolsand workflows for data sharing through the EBRAINS Data services.
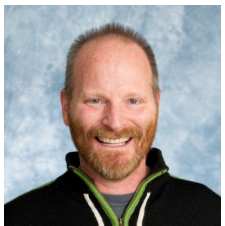
**Steve Simske, PhD** is a Professor of Systems Engineering at Colorado State University since 2018. Steve was formerly at HP and HP Inc from 1994-2018, and was an HP Fellow, Vice President, and Director in HP Labs. He is the author of roughly 500 publications and more than 200 US patents. He is an IS&T Fellow, and its immediate past President (2017-2019). Steve is the Steering Committee Chair for the ACM DocEng Symposium, which meets annually. Dr. Simske was a member of the World Economic Forum Global Agenda Councils from 2010-2016, including Illicit Trade, Illicit Economy and the Future of Electronics. In his 20+ years in industry, Steve directed teams in research on 3D printing, education and learning, life sciences, sensing, authentication, packaging, analytics, imaging and manufacturing. His books "Meta-Algorithmics," "Meta-Analytics," and "Functional Applications of Text Analytics Systems" address intelligent systems. He is currently co-authoring books on Industrial Inkjet Printing (Wiley, 2nd ed., 2021) and Composition (2022). At CSU, Steve has a cadre of on-campus students in Systems, Mechanical, and Biomedical Engineering, along with a larger contingent of on-line/remote graduate students researching in a wide variety of disciplines, from GAN-driven imaging to the history of science. His information is available at https://www.engr.colostate.edu/se/steve-simske/.