Data in Motion: New Approaches to Advancing Scientific, Engineering and Medical Progress

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Speaker and Moderator Biographical Information

JAMES HENDLER (Planning Committee Chair) is the Director of the Institute for Data Exploration and Applications and the Tetherless World Professor of Computer, Web and Cognitive Sciences at Rensselaer Polytechnic Institute and an affiliate of the Department of Industrial and Systems Engineering. He also serves as a Director of the UK's charitable Web Science Trust and a visiting faculty researcher at Bath Spa University. Dr. Hendler has authored over 400 books, technical papers and articles in the areas of Semantic Web, artificial intelligence, agent-based computing and high performance processing. One of the originators of the "Semantic Web," Dr. Hendler is a Fellow of the American Association for Artificial Intelligence, the British Computer Society, the Institute of Electrical and Electronics Engineers (IEEE) and the American Association for the Advancement of Science (AAAS). He is also the former Chief Scientist of the Information Systems Office at the U.S. Defense Advanced Research Projects Agency (DARPA) and was awarded a U.S. Air Force Exceptional Civilian Service Medal in 2002. He is also the first computer scientist to serve on the Board of Reviewing editors for Science. In 2010, Dr. Hendler was named one of the 20 most innovative professors in America by Playboy magazine and was selected as an "Internet Web Expert" by the US government. In 2012, he was one of the inaugural recipients of the Strata Conference "Big Data" awards for his work on large-scale open government data, and he is a columnist and associate editor of the Big Data journal. In 2013, he was appointed as the Open Data Advisor to New York State and in 2015 appointed a member of the U.S. Homeland Security Science and Technology Advisory Committee. Dr. Hendler received his B.S in Computer Science from Yale University, his M.S. in Cognitive Phycology from Southern Methodist University, and his ScM and Ph.D. in Computer Science from Brown University.

INA ANREITER is a behavioral geneticist working to understand how genes and environmental factors combine to regulate the expression of genes that guide how individuals behave. As a Schmidt Science Fellow working with Dr. Jared Simpson at the Ontario Institute of Cancer Research, she is pivoting into machine learning and aims to develop new methods for studying environmental influences on the regulation of gene expression. Dr. Anreiter's research is uncovering new insights into the age-old debate of nature versus nurture—or more accurately, the differing role of genetics and epigenetics. She has found that the interaction of the two is more important than many people often think. This is important as complex genes are regulated to influence multiple behaviors and therapies targeting one gene can lead to unexpected side effects. Dr. Anreiter plans to use the combination of novel RNA sequencing techniques with the capabilities of the fruit fly as a model organism to develop new computational approaches that could then be applied to the study of genetic mutations in any

organism. She completed her Ph.D. in the Department of Ecology & Evolutionary Biology at University of Toronto.

STEFANO BERTOZZI (NAM) is Dean Emeritus and Professor of Health Policy and Management at the University of California (UC), Berkeley's School of Public Health. Previously, he directed the HIV and tuberculosis programs at the Bill and Melinda Gates Foundation. Dr. Bertozzi worked at the Mexican National Institute of Public Health as director of its Center for Evaluation Research and Surveys. He was the last director of the World Health Organization (WHO) Global Programme on AIDS and has also held positions with the Joint United Nations Programme on HIV and AIDS (UNAIDS), the World Bank and the government of the DRC. He is currently the interim director of the UC systemwide programs with Mexico (UC-MEXUS, the UC-Mexico Initiative and Casa de California). He recently co-edited the Disease Control Priorities (DCP3) volume on HIV/AIDS, Malaria & Tuberculosis. He has served on governance and advisory boards for the East Bay Community Foundation, HopeLab, the United Nations Children's Fund (UNICEF), WHO, UNAIDS, the Global Fund, PEPFAR, the National Institutes of Health (NIH), Duke University, the University of Washington and the American Medical Association (AMA). He has advised non-governmental organizations (NGOs), and ministries of health and social welfare in Asia, Africa and Latin America. He is a member of the National Academy of Medicine (NAM). He holds a bachelor's degree in biology and a Ph.D. in health policy and management from the Massachusetts Institute of Technology. He earned his medical degree at UC San Diego, and trained in internal medicine at UC San Francisco.

ANA BONAKA is Fellow at the Institute for Theory and Computation at Harvard University. Dr. Bonaca studies how the tidal field of the Milky Way galaxy disrupts globular clusters, and what the resulting debris can tell us about the underlying distribution of dark matter. In her work, she uses data from large photometric surveys, as well as high-resolution numerical simulations. Her research interests include tidal disruption of Galactic satellites and buildup of its stellar halo, global mapping of dark matter in the Milky Way and searches for low-mass dark matter subhalos. Dr. Bonaca received her Ph.D. in Astronomy from Yale University in 2016.

AMY BRAND (Planning Committee Member) was named Director of the MIT Press in July 2015. Previously, she served as Vice President of Academic and Research Relations and Vice President of North America at Digital Science. From 2008 to 2013, Dr. Brand worked at Harvard University, first as Program Manager of the Office for Scholarly Communication and then as Assistant Provost for Faculty Appointments and Information. Before moving to Harvard, she held long-term positions as an Executive Editor at the MIT Press and as Director of Business and Product Development at CrossRef. Dr. Brand serves on the Duraspace Board of Directors, was a founding member of the ORCID Board, and regularly advises on key community initiatives in digital scholarship. She holds a B.A. in linguistics from Barnard College and a Ph.D. in cognitive science from Massachusetts Institute of Technology.

ANDREW CONNOLLY is a Professor of Astronomy at the University of Washington, Seattle. He has a long-term interest in machine learning and its application to cosmology and astrophysics. He is the Director of the DIRAC Institute at the University of Washington. He was previously the Computing Coordinator for the Dark Energy Science Collaboration (DESC), a DOE-led

collaboration of over 500 scientists focused on dark energy science with the LSST, led the development of the software for alert generation for the Large Synoptic Survey Telescope (LSST) at the University of Washington, and was the Simulation Scientists for the LSST. He has 25 years of experience in leading and developing statistical and machine learning tools for astronomy, coauthored a book on machine learning for astronomy, "Statistics, Data Mining and Machine Learning in Astronomy: A Practical Python Guide for the Analysis of Survey Data," and has taught numerous summer schools and courses in these areas. While on sabbatical at Google in 2006, he led the development of GoogleSky.

VILAS DHAR is Inaugural President of the Patrick J. McGovern Foundation and Senior Berggruen Fellow. Mr. Dhar is a scholar, entrepreneur, and philanthropist with a lifelong commitment to re-imagining society and its institutions for the betterment of humanity. His current research explores fundamental questions about our preparedness to enter an artificial intelligence enabled age. By critically evaluating social, economic, and technical factors that lead to inequality and injustice in the genesis of new technologies, his work guides our shared response to a great challenge—the creation of resilient institutions that can defend and empower our fundamental conception of what it means to be human in a technology-first world. Mr. Dhar serves as Trustee of the Patrick J. McGovern Foundation, a large philanthropic endowment focused on advancing neuroscience and technology for good, and serves on several public and private sector boards and advisory committees. His career has included founding and serving as Chief Executive Officer of a recognized public interest law firm, investing in and serving as board director of socially conscious companies, and creating one of the world's first nonprofit organization incubators—leveraging private sector expertise for the public good. He has served as the Gleitsman Fellow on Social Change at Harvard University, Practitioner Resident on Artificial Intelligence at the Rockefeller Foundation's Bellagio Center in Lake Como, Italy, and Entrepreneur-in-Residence at the University of Illinois. He holds a J.D. from New York University School of Law, an M.P.A. from the Harvard Kennedy School, and dual Bachelor's degrees in Biomedical Engineering and Computer Science from the University of Illinois.

STUART FELDMAN (Planning Committee Member) is Chief Scientist of Schmidt Futures where he is responsible for the Scientific Knowledge programs, including creating fellowship programs, supporting nascent innovative research projects, and driving new platforms and larger research projects that aim to change the way scientific research is done. Previously, as Google's vice president of engineering, Dr. Feldman was responsible for the health and productivity of Google's engineering offices in the eastern part of the Americas, Asia, and Australia and also had executive responsibility for a number of Google products. Prior to that, Dr. Feldman served as Vice President for Internet Technology and was responsible for IBM strategies, standards, and policies relating to the future of the Internet, and managed a department that created experimental Internet-based applications. Earlier, he was the founding Director of IBM's Institute for Advanced Commerce, which was dedicated to creating intellectual leadership in e-commerce. Dr. Feldman completed his academic work in astrophysics and mathematics and earned his AB at Princeton and his Ph.D. at Massachusetts Institute of Technology. He was awarded an honorary Doctor of Mathematics by the University of Waterloo in 2010. Dr. Feldman is former President of ACM (Association for Computing Machinery) and member of the board of directors of the AACSB (Association to Advanced Collegiate Schools of Business). He is

a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), of the ACM, and of the American Association for the Advancement of Science (AAAS) and serves on a number of government advisory committees.

PETER FOX is a Tetherless World Constellation Chair and Professor of Earth and Environmental Science, Computer Science and Cognitive Science at Rensselaer Polytechnic Institute. Dr. Fox also directs the Insitution-wide interdisciplinary Information Technology and Web Science program. Previously, he was Chief Computational Scientist at the High Altitude Observatory of the National Center for Atmospheric Research and before that a research scientist at Yale University. Dr. Fox has a B.Sc. (hons) and Ph.D. in Applied Mathematics (including physics and computer science) from Monash Univsersity. His research and education agenda covers the fields of data science and analytics, ocean and environmental informatics, computational logic, semantic Web, cognitive bias, semantic data frameworks, and solar and solar-terrestrial physics. The results are applied to large-scale distributed scientific repositories addressing the full life-cycle of data and information within specific science and engineering disciplines as well as among disciplines. Dr. Fox was President of the Federation of Earth Science Information Partners (ESIP 2104-2016). Dr. Fox served as chair of the International Union of Geodesy and Geophysics Union Commission on Data and Information (2007-2015), is past chair of the AGU Special Focus Group on Earth and Space Science Informatics, and Editor-in-Chief of the American Geophysical Union journal Earth and Space Science. Dr. Fox served on the International Council for Science's Strategic Coordinating Committee for Information and Data. Dr. Fox was awarded the 2012 Martha Maiden Lifetime Achievement Award for service to the Earth Science Information community, and the 2012 European Geosciences Union Ian McHarg Medal for significant contributions to Earth and Space Science Informatics. In 2015, Dr. Fox was elected as the first Earth and Space Science Informatics fellow to the American Geophysical Union. In 2018 Dr. Fox was elected as Fellow to the American Association for the Advancement of Science.

SALMAN HABIB (Planning Committee Member) is a Senior Physicist and Computational Scientist for the High Energy Physics and Mathematics and Computer Science Divisions at Argonne National Laboratory, a Senior Member of the Kavli Institute for Cosmological Physics at the University of Chicago, and a Senior Fellow in the Computation Institute, a joint collaboration between Argonne National Laboratory and the University of Chicago. For the last two decades, Dr. Habib has been very interested in the intelligent application of parallel supercomputers to attacking physics problems. This has led to algorithm and code development in a variety of fields and on a variety of platforms, beginning with the Connection Machines in the early 1990's and leading on to the current BG/Q system, Mira, now installed at Argonne. More recently he has become involved in efforts—with cosmology as the primary arena—to apply advanced statistical methods to complex inference problems where the datasets are very large (with small statistical uncertainties) and the forward model predictions involve supercomputer calculations. Dr. Habib is a member of the Dark Energy Survey (DES) and the Large Synoptic Survey Telescope (LSST) projects. Dr. Habib received his Ph.D. from the University of Maryland and did his undergraduate work at the Indian Institute of Technology, Delhi, India. He was a postdoc at the University of British Columbia, and later, a postdoc and

staff member in the Theoretical Division at Los Alamos National Laboratory before moving to Argonne in 2011.

DAVID HAUSSLER (NAS/NAE) is a professor of biomolecular engineering at University of California (UC), Santa Cruz, scientific director of the UC Santa Cruz Genomics Institute, scientific co-director of the California Institute for Quantitative Biosciences, and a consulting professor at Stanford University School of Medicine and the UC San Francisco Biopharmaceutical Sciences Department. Dr. Haussler uses mathematics, computer science, and biology to study the genomes of organisms with the goal of understanding disease and evolution. As part of the Human Genome Project, he led the team that published the first publicly available draft of the human genome sequence. He now heads several large-scale projects, including the Genome 10K Project, the UCSC Cancer Genomics Hub (CGHub), and the Global Alliance for Genomics and Health. The Haussler-Salama Lab has helped revolutionize the field of genomics with the introduction of advanced statistical and algorithmic methods. This work accelerates the understanding of cancer, human development, evolution, and many other areas of active research. Dr. Haussler is the recipient of numerous prestigious awards for his scientific achievements, including the Dan David Prize. He is a member of the National Academy of Engineering (NAE), the National Academy of Sciences (NAS), he serves on the Chan Zuckerberg Initiative (CZI) Scientific Advisory Board, and is a Howard Hughes Medical Institute (HHMI) Investigator. Dr. Haussler received his Ph.D. in computer science from the University of Colorado at Boulder.

HIROAKI KITANO is a President and CEO at Sony Computer Science Laboratories, Inc., Tokyo, a President at The Systems Biology Institute, Tokyo, a Professor at Okinawa Institute of Science and Technology Graduate University, Okinawa, and a Director at Laboratory for Disease Systems Modeling, RIKEN Center for Integrative Medical Sciences, Kanagawa. He received a B.A. in physics from the International Christian University, Tokyo, and a Ph.D. in computer science from Kyoto University. Since 1988, he has been a visiting researcher at the Center for Machine Translation at Carnegie Mellon University. His research career includes a Project Director at Kitano Symbiotic Systems Project, ERATO, Japan Science and Technology Corporation followed by a Project Director at Kitano Symbiotic Systems Project, ERATO-SORST, Japan Science and Technology Agency, a visiting professor of Keio University, a visiting professor of the University of Tokyo, and so on. He is also a Manager of Division of Cancer Systems Biology, Cancer Institute, Japanese Foundation for Cancer Research, a Sir Louis Matheson Distinguished Professor of Australian Regenerative Medicine Institute, Monash University, Australia, a Founding President of The RoboCup Federation, and an Editor-in-Chief of npj Systems Biology and Applications. Kitano received The Computers and Thought Award from the International Joint Conferences on Artificial Intelligence in 1993, Prix Ars Electronica 2000, Design Award 2001(Japan Inter-Design Forum), Good Design Award 2001, and Nature's 2009 Japan Mid-career Award for Creative Mentoring in Science, as well as being an invited artist for Biennale di Venezia 2000 and Museum of Modern Art (MoMA) New York in 2001.

JULIA LANE is a Professor at the New York University (NYU) Wagner Graduate School of Public Service, at the NYU Center for Urban Science and Progress, and a NYU Provostial Fellow for Innovation Analytics. She cofounded the Coleridge Initiative, whose goal is to use data to

transform the way governments access and use data for the social good through training programs, research projects and a secure data facility. The approach is attracting national attention, including the Commission on Evidence Based Policy and the Federal Data Strategy. Previous to this, Dr. Lane was a Senior Managing Economist and Institute Fellow at American Institutes for Research. In this role Dr. Lane co-founded the Institute for Research on Innovation and Science (IRIS) at the University of Michigan. Dr. Lane has held positions at the National Science Foundation, The Urban Institute, The World Bank, American University and NORC at the University at Chicago. Dr. Lane has published over 80 articles in leading economics journals, and authored or edited ten books. She is an elected fellow of the American Association for the Advancement of Science, the International Statistical Institute and a fellow of the American Statistical Association. She has been the recipient of over $70 million in grants from foundations, government agencies in the U.S., U.K., and New Zealand, as well as from international organizations. Dr. Lane is the recipient of the 2014 Julius Shiskin award and the 2014 Roger Herriot award. She is also the recipient of the 2017 Warren E. Miller Award. Dr. Lane received her Ph.D. in Economics and Master's in Statistics from the University of Missouri.

JESSICA POLKA is Executive Director of ASAPbio. She leads initiatives related to peer review and oversees the organization's general administrative and strategic needs. Before becoming a visiting scholar at the Whitehead Institute, Dr. Polka performed postdoctoral research in the department of Systems Biology at Harvard Medical School (2013-2016) following a Ph.D. in Biochemistry from UCSF (2012). She lives and works in Cambridge, MA and enjoys running, cooking, crocheting, recreational microscopy, and ISO 8601. Other activities: Jessica also serves as president of the board of directors of Future of Research, a steering committee member of Rescuing Biomedical Research, and a member of ASCB's public policy committee.

WILLIAM REGLI is Director of the Applied Research Laboratory for Intelligence and Security (ARLIS) at University of Maryland. He is also Professor of Computer Science at the Maryland Robotics Center, an interdisciplinary research center housed in the Institute for Systems Research within the A. James Clark School of Engineering. Dr. Regli is a computer scientist who has focused his career on interdisciplinary and use-inspired problems spanning engineering, artificial intelligence and computational modeling and graphics. His most recent activities have deployed cyber-infrastructure systems to capture and curate engineering and science data in order to ensure long-term sustainability. He was the sixth director of the Institute for Systems Research, from 2018-2019. From 2014 to 2017 Dr. Regli served on the leadership team of the Defense Advanced Research Projects Agency (DARPA), as Deputy Director (9/2014-12/2016) and then Acting Director (1/2017-7/2017) of the Defense Sciences Office (DSO). Dr. Regli's other government service includes as a Scientific Adviser to the U.S. Department of Energy's (DoE) National Nuclear Security Administration (NNSA) in the areas of information technology and manufacturing (2010-2014) and as a National Research Council Postdoctoral Fellow at the National Institute of Standards and Technology (NIST) (1995-1997). For his contributions, Regli received the DARPA Meritorious Public Service Medal (2018). Dr. Regli holds a Ph.D. in Computer Science from the University of Maryland at College Park and Bachelor of Science degree in Mathematics from Saint Joseph's University. He is a member of the American Association for the Advancement of Science (AAAS); an elected senior member of the Association of Computing Machinery (ACM) and of the Association for the Advancement of

Artificial Intelligence (AAAI); and a Fellow of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) for his "contributions to 3D search, design repositories and intelligent manufacturing."

NICHOLAS SCHWARZ is a Computer Scientist at Argonne National Laboratory (ANL). At ANL Dr. Schwarz leads the scientific software and data management effort at the Advanced Photon Source x-ray synchrotron light source user facility. His research interests focus on applying state-of-the-art computational techniques, AI/ML, and infrastructure to solve scientific domain problems. At the Advanced Photon Source, Dr. Schwarz led the development of a facility-wide data management system. He co-authored the common data policy currently being adopted by US-based x-ray facilities. He co-organizes the Workshop on Extreme-scale Experiment-in-the-Loop Computing (XLOOP) at SC and served as the chair of the International Organizing Committee for the New Opportunities for Better User Group Software conference. Currently, he chairs a working group consisting of representatives from the US-based light source user facilities aimed at fostering collaborations and solving pressing issues in the area of data analysis and management.

AMY SHEPHERD is a behavioral neuroscientist interested in improving interventions for sufferers of diseases such as Alzheimer's. During her Ph.D., she developed and characterized a touchscreen-based mouse model to help us better understand and expand the effectiveness of similar assessments and therapies used with human patients. As a Schmidt Science Fellow, Dr. Shepherd plans to study the role of the millions of neurons in the human gut and the link between gastrointestinal symptoms and neurological disease. She believes that understanding the interplay between specific gut-resident nerve cells, the immune system, and the gut could improve our understanding of many brain and gut disorders. Dr. Shepherd received her Ph.D. from University of Melbourne.

MARK ZELINKA is a climate and atmospheric scientist at Lawrence Livermore National Laboratory who researches how much global warming we should expect from increasing greenhouse gases. His work focuses on understanding feedbacks, whereby warming causes changes throughout the climate system that lead to further warming. Mark received his Ph.D. in atmospheric sciences from the University of Washington in 2010. He is a contributing author to the upcoming 6th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), and has authored over 60 publications in the field of climate science.

EVAN ZHAO is a chemical engineer who has utilized timed light to control and then engineer microbes to produce new, valuable chemicals without the need for fossil fuel-based precursors. As a Schmidt Science Fellow, he is now pivoting to work on RNA sensing in cells for medical applications. Dr. Zhao aims to utilize a cell's ability to sense its environment to develop a sensor that could control the production of therapeutic proteins within the cell, tailoring treatment to a patient's specific needs. He completed his engineering Ph.D. from Princeton University.