

PRESENTER BIOSKETCHES

ENVISIONING COMPUTATIONAL INNOVATIONS FOR CANCER CHALLENGES: SCOPING MEETING

March 6-7, 2019

Livermore Valley Open Campus
Livermore, California

WELCOME AND ORIENTATION



Name

Emily Greenspan, Ph.D.

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Dr. Greenspan works as a biomedical informatics program director in the Center for Biomedical Informatics and Information Technology (CBIIT) at NCI. Her primary role is NCI program lead for the NCI/Department of Energy collaborations, including the Accelerating Therapeutics for Opportunities in Medicine (ATOM) Consortium and the *Joint Design of Advanced Computing Solutions for Cancer (JDACS4C)* program. Prior to her role at CBIIT, Emily served as a program director for the NCI's Provocative Questions Initiative in the Center for Strategic Scientific Initiatives where she also helped organize and lead several of NCI's cancer technology focused programs. Emily's grad school and postdoctoral research focused on cancer chemoprevention and arachidonic acid metabolism.

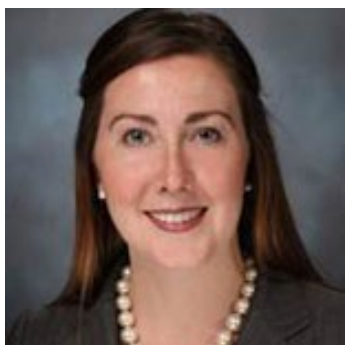
WELCOME AND ORIENTATION



Name **Carolyn Lauzon, Ph.D.**
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Dr. Carolyn Vea Lauzon serves in the Department of Energy, Office of Science, Office of Advanced Scientific Computing Research. Carolyn is the Facilities Program Manager for the NERSC high performance computing facility at Lawrence Berkeley National Laboratory and the DOE Office of Science lead for DOE partnerships with the National Institutes of Health and the Department of Veterans Affairs. Before joining federal service, Carolyn completed her post doctoral fellowship in Computational Medical Image Analysis at Vanderbilt University and received her PhD in Molecular Biophysics from the Johns Hopkins School of Medicine.

WELCOME AND ORIENTATION



Name Amy Gryshuk, Ph.D.
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Amy L. Gryshuk, Ph.D., serves as the Director of Strategic Engagements and Alliance Management for the Physical and Life Sciences Directorate at Lawrence Livermore National Laboratory (LLNL). Since 2011, Dr. Gryshuk has developed and implemented action plans and partnering strategies for multidisciplinary research collaborations and agreements between LLNL investigators and external partners, including collaborators from government, academia, and industry. Dr. Gryshuk has been working to foster the collaboration between the U.S. Department of Energy and the National Cancer Institute and is serving as a co-program manager for *the Joint Design of Advanced Computing Solutions for Cancer (JDACS4C)* research pilots that are focused on extreme-scale computing in cancer applications. Her leadership skills in business management and strategic engagements have also contributed to the launch of the *Accelerating Therapeutics for Opportunities in Medicine (ATOM)* consortium, a public-private partnership focused on integrating high performance computing, diverse biological data, and emerging biotechnologies to create a new pre-competitive platform for drug discovery. Most recently, Dr. Gryshuk is co-leading a new multi-institutional project exploring the challenges and advancements of the Department of Energy's capabilities in cognitive computing – coupling Artificial Intelligence and computing at scale. Prior to joining LLNL, Dr. Gryshuk served as the Director of New Ventures at the National Science Foundation-funded Center for Biophotonics Science & Technology at the University of California, Davis from 2008-2011 under a University of California Office of the President, UC Discovery Fellowship. She also completed her postdoctoral research at the University of California, Davis and Lawrence Livermore National Laboratory from 2005-2008. Dr. Gryshuk received her Ph.D. in Molecular Pharmacology from the State University of New York (SUNY) at Buffalo – Roswell Park Cancer Institute medical branch campus in 2005. Her doctoral work focused on the synthesis and evaluation of new long-wavelength photosensitizing agents (700 nm purpurinimides and 800 nm bacteriopurpurinimides) for the detection and treatment of cancer via photodynamic therapy (PDT).

WELCOME AND ORIENTATION



Name Eric Stahlberg, Ph.D.
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Dr. Stahlberg is the Director of Biomedical Informatics and Data Science (BIDS) at Frederick National Laboratory for Cancer Research (FNLCR). He has been instrumental in establishing the Frederick National Laboratory's high-performance computing initiative and in assembling scientific teams across multiple, complex organizations to advance predictive oncology.

Stahlberg first joined the Frederick National Laboratory in 2011 to form and direct the National Cancer Institute (NCI)'s Center for Cancer Research Bioinformatics Core, which helped build intramural research collaborations between the national laboratory and NCI.

Since then, Stahlberg has played a leadership role in many key partnerships, including a major collaboration between the NCI and the Department of Energy (DOE). Under the *Joint Design of Advanced Computing Systems for Cancer (JDACS4C)*, NCI and DOE are accelerating progress in precision oncology and computing. The collaboration is rooted in three major national initiatives; the Precision Medicine Initiative, the National Strategic Computing Initiative, and the Cancer Moonshot.

Stahlberg has spearheaded the Frederick National Laboratory's contributions to a number of JDACS4C projects, including ATOM and CANDLE. He helped launch and support the annual meeting series, Frontiers in Predictive Oncology and Computing. In 2017, he was recognized as one of FCW's Federal 100. Stahlberg holds a Ph.D. in computational chemistry from The Ohio State University.

WELCOME AND ORIENTATION



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I am the CEO of Knowinnovation. KI is a consulting firm specializing in accelerating scientific innovation.

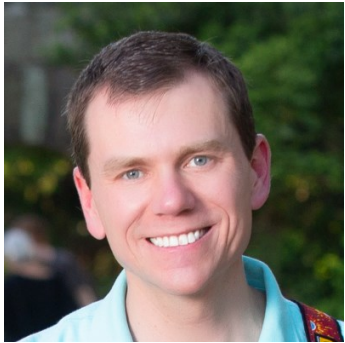
WELCOME AND ORIENTATION



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Stavros has a long Greek surname that nobody can remember, let alone pronounce. Fortunately, his first name is unique and memorable, just like him. A long entrepreneurial journey and a diverse educational foundation give Stavros his individual point of view. From his Bachelor of Professional Studies in Construction Management, to his Master of Science in Creative Studies, to his distressed takeover of the family business and the founding of a chain of eco-friendly dry-cleaners, it seems like Stavros has done it all. Currently he loves his job facilitating and training collaborative creativity, and he also teaches at the University of Southern Florida in St. Pete where he lives with his family. (Apparently, it's impossible for him to do just one thing). He enjoys friends, philosophy and sailing. Jibe Ho!

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Michael Peter Cooke, Ph.D.
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Moderator

Dr. Michael Cooke is the Program Manager for Strategic Planning and Communications in the Office of High Energy Physics at the U.S. Department of Energy's Office of Science. His work includes sharing the excitement of particle physics with audiences from key decision makers to the general public. Michael was a AAAS Science & Technology Policy Fellow at the Department of Energy from 2013 to 2015. Before moving to the D.C. area, Michael worked at Fermi National Accelerator Laboratory in Batavia, IL, where he helped search for the Higgs boson, a particle discovered in 2012. In addition to his research, Michael contributed to many activities to advance STEM education, especially for K-12 students, and earned the 2010 Director's Award for Exceptional Volunteer Service. As part of his outreach efforts, Michael created demonstration equipment and wrote biweekly articles for the general public that summarized recent Fermilab research results. He served as an elected member of the Fermilab Users Executive Committee, through which he helped communicate the important benefits to society that arise from fundamental research. Michael earned his Ph.D. in experimental high-energy particle physics in 2008 from Rice University in Houston, TX, by making precision measurements of the interactions between fundamental particles. He earned a B.S. in physics in 2001 from Carnegie Mellon University in Pittsburgh, PA.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Elizabeth Hsu, Ph.D., MPH
Title	Program Manager
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Moderator

Dr. Elizabeth (Betsy) Hsu is a program manager in the National Cancer Institute's (NCI) Center for Biomedical Informatics and Information Technology (CBIIT). Her work primarily focuses on leading NCI activities related to data sharing in support of the Beau Biden Cancer Moonshot, including facilitating the Enhanced Data Sharing working group of the NCI Blue Ribbon Panel and the implementation of the recommendation from that working group. In addition, she supports the training and outreach efforts of the Informatics Technology for Cancer Research Program and has supported interagency collaborations and projects and public-private partnerships around research data sharing and technology-related activities. Prior to joining CBIIT, Dr. Hsu served on detail to the US Department of Health and Human Services (HHS) Innovation, Design, Entrepreneurship, and Action (IDEA) Lab/Office of the HHS Chief Technology Officer, where she worked on a pilot open data project related to the Health Data Initiative.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Jessica Boten, MPH
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Jessica Boten, MPH, is a communications specialist for the Surveillance Research Program at the National Cancer Institute. Ms. Boten is the lead project manager for the NCI-Department of Energy Collaboration Pilot 3 to advance computing for comprehensive surveillance for population cancer health. She also works on various natural language processing initiatives including the development of the Clinical Document Annotation and Processing Pipeline and the Inter-Agency Machine Learning Collaboration with the CDC, FDA, NIH, and DOE.

Ms. Boten earned her Bachelor of Arts in Public Health and Hispanic Studies at the College of William and Mary. She spent two years at University of Nebraska Medical Center doing research on the effects of smoke, alcohol, and hog dust on lung cells. She graduated with her MPH in Health Behavior at UNC-Chapel Hill. While at UNC, Ms. Boten created a community engagement program to improve information dissemination to older adults in the county. Her professional interests include project management, program operations, and natural language processing.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Yvonne Evrard, Ph.D.
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Yvonne A. Evrard, PhD is the Operations and Program Manager for the NCI Patient-Derived Models Repository (PDMR, pdmr.cancer.gov). She provides scientific oversight for model development, characterization, and preclinical modeling efforts for the PDMR. The PDMR is focused on obtaining clinical specimens from non-hematologic cancers that are underrepresented in the PDX community including rare cancers. Dr. Evrard oversees multiple funding opportunities for acquisition of patient tumor material for model development as well as deposition of patient-derived models from outside researchers into the PDMR. All models are associated with the medical history from consented patients including current and prior therapies and patient response. Using these data as well as NextGen sequencing, Dr. Evrard helps implement preclinical studies for new combination therapies and novel therapeutics. Dr. Evrard oversees daily operations of the PDMR and coordinates the efforts of the interdisciplinary team that are needed for this effort. She has a research background in developmental biology, generation of transgenic mouse models, chromatin biology, and molecular biology.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name Dwight Nissley, Ph.D.
Title Director, Cancer Research Technology Program (CRTP)
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Phone (301) 846-1181

Dr. Nissley is the Director of the Cancer Research Technology Program (CRTP) Directorate at Frederick National Laboratory for Cancer Research (FNLCR). In this role he is responsible for the efforts of 170 scientists working in a broad range of technology, and basic and translational research in the areas of nanotechnology, cryo-EM, oncology and drug discovery. As CRTP head, he is also responsible for the NCI RAS Initiative (<https://www.cancer.gov/research/key-initiatives/ras>), an NCI-funded program that aims to find therapeutic interventions against oncogenic RAS which is a driver in up to a third of all cancers.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Rick Stevens
Title	Professor and Associate Laboratory Director
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Since 1999, Rick Stevens has been a professor at the University of Chicago and since 2004, an Associate Laboratory Director at Argonne National Laboratory. He is internationally known for work in high-performance computing, collaboration and visualization technology, and for building computational tools and web infrastructures to support large-scale genome and metagenome analysis for basic science and infectious disease research. He teaches and supervises students in the areas of computer systems and computational biology. He co-leads the DOE national laboratory group that has been developing the national initiative for Exascale computing.

Stevens is principal investigator for the NIH/NIAID supported PATRIC Bioinformatics Resource Center which is developing comparative analysis tools for infectious disease research and serves a large user community. Stevens is also the PI of The Exascale Deep Learning and Simulation Enabled Precision Medicine for Cancer project through the Exascale Computing Project (ECP), which focuses on building a scalable deep neural network code called the CANcer Distributed Learning Environment (CANDLE) to address three top challenges of the National Cancer Institute. Stevens is also one of the PIs for the DOE-NCI Joint Design of Advanced Computing Solutions for Cancer project, part of the Cancer Moonshot initiative. In this role, he leads a pilot project on pre-clinical screening aimed at building machine learning models for cancer drug response that will integrate data from cell line screens and patient derived xenograft models to improve the range of therapies available to patients.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Frederick H. Streitz, Ph.D.
Title	Chief Computational Scientist
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Fred Streitz is Chief Computational Scientist and Director of the High Performance Computing Innovation Center (HPCIC) at Lawrence Livermore National Laboratory (LLNL). He develops strategies and leads efforts to address the nation's forefront scientific problems through the application of supercomputing and guides LLNL's efforts to form strategic industrial, academic and government collaborations that support and expand HPC capabilities at the Lab.

Fred Serves on advisory boards for Argonne and Oak Ridge National Labs and as a Subject Editor for the International Journal of High-Performance Computing Applications, in addition to participation in the Advanced Computing Round Table at the Council on Competitiveness. He is a Fellow of the American Physical Society and a two-time winner of the IEEE Gordon Bell Prize.

Dr. Streitz received a B.S in Physics from Harvey Mudd College in Claremont, California and a Ph.D. in Physics from the Johns Hopkins University in Baltimore, Maryland.

SESSION 1: WHAT'S POSSIBLE COLLABORATING ACROSS DISCIPLINES AND ORGANIZATIONS



Name	Georgia Tourassi, Ph.D.
Title	Director, Health Data Sciences Institute
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Dr. Georgia Tourassi is the founding Director of the Health Data Sciences Institute and Group Leader of Biomedical Sciences, Engineering and Computing at the Oak Ridge National Laboratory (ORNL). Concurrently, she holds appointments as an adjunct Professor of Radiology at Duke University and the University of Tennessee and as a joint UT-ORNL Professor of Mechanical, Aerospace, and Biomedical Engineering at the University of Tennessee at Knoxville. Her research interests include medical imaging, biomedical informatics, clinical decision support systems and data-driven biomedical discovery. She serves on the FDA Advisory Committee and Review Panel on Computer-Aided Diagnosis Devices and she has been appointed Charter member of two NIH Study sections. Her scholarly work has led to 9 US patents and innovation disclosures and more than 230 peer-reviewed journal articles, conference proceedings articles, and book chapters.

Her research in medical imaging has been featured in numerous high-profile publications such as the MIT Science and Technology Review, Oncology Times and the Economist. Dr. Tourassi has served as Associate Editor of the scientific journals Radiology and Neurocomputing, and as a Guest Associate Editor of Medical Physics. She is elected Fellow of the American Institute of Medical and Biological Engineering (AIMBE), the American Association of Medical Physicists (AAPM) and the International Society for Optics and Photonics (SPIE). For her leadership in the Joint Design of Advanced Computing Solutions for Cancer initiative, she recently received the DOE Secretary's Appreciation Award. Dr. Tourassi holds a B.S. degree in Physics from Aristotle University of Thessaloniki, Greece and a Ph.D. in Biomedical Engineering from Duke University.

KEYNOTE PRESENTATION: DOE SUCCESS STORY: LEADING WITH SCIENCE IN A COMPUTATIONAL CONTEXT



Name Peter Nugent, Ph.D.
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Keynote Speaker

I received BA from Bowdoin College in 1990 followed by a MS and PhD in Physics from the University of Oklahoma in 1997. I came to Berkeley in 1996 to work with the Supernova Cosmology Project in the Physics Division at Lawrence Berkeley National Laboratory (LBNL), where the group made the first measurements of the accelerating universe. I then moved to the Computational Research Division in 2000 as a staff scientist. In 2008, I co-founded the Computational Cosmology Center and became their first group leader. I was promoted to senior staff scientist at LBNL in 2010 and the same year joined the faculty in the Astronomy Department at UC Berkeley. In 2014, I became the division deputy for scientific engagement in the Computational Research Division at LBNL.

Description of work:

My research focuses on the use of high-performance computing to tackle problems spanning data analysis and theoretical simulation in cosmology and astrophysics.

I am the PI of the Type Ia Supernova program in the Palomar Transient Factory as well as a member of the Dark Energy Survey and the Dark Energy Spectroscopic Instrument. In all three experiments, I am involved in processing large amounts of optical digital imaging data (many TBs on a nightly basis) for which we use machine learning algorithms to perform target selection of interesting astrophysical objects for follow-up. On the theoretical side, I am involved with carrying out spectrum synthesis calculations for supernovae as well as studies of the formation of large-scale structures in the universe, like galaxies and clusters of galaxies. For both, we work on creating novel techniques to directly compare these simulations to observations.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name Amy Gryshuk, Ph.D.
Title Director, Strategic Engagements & Alliance Management
Physical & Life Sciences (PLS) Directorate
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Moderator

Amy L. Gryshuk, Ph.D., serves as the Director of Strategic Engagements and Alliance Management for the Physical and Life Sciences Directorate at Lawrence Livermore National Laboratory (LLNL). Since 2011, Dr. Gryshuk has developed and implemented action plans and partnering strategies for multidisciplinary research collaborations and agreements between LLNL investigators and external partners, including collaborators from government, academia, and industry. Dr. Gryshuk has been working to foster the collaboration between the U.S. Department of Energy and the National Cancer Institute and is serving as a co-program manager for *the Joint Design of Advanced Computing Solutions for Cancer (JDACS4C)* research pilots that are focused on extreme-scale computing in cancer applications. Her leadership skills in business management and strategic engagements have also contributed to the launch of the *Accelerating Therapeutics for Opportunities in Medicine (ATOM)* consortium, a public-private partnership focused on integrating high performance computing, diverse biological data, and emerging biotechnologies to create a new pre-competitive platform for drug discovery. Most recently, Dr. Gryshuk is co-leading a new multi-institutional project exploring the challenges and advancements of the Department of Energy's capabilities in cognitive computing – coupling Artificial Intelligence and computing at scale. Prior to joining LLNL, Dr. Gryshuk served as the Director of New Ventures at the National Science Foundation-funded Center for Biophotonics Science & Technology at the University of California, Davis from 2008-2011 under a University of California Office of the President, UC Discovery Fellowship. She also completed her postdoctoral research at the University of California, Davis and Lawrence Livermore National Laboratory from 2005-2008. Dr. Gryshuk received her Ph.D. in Molecular Pharmacology from the State University of New York (SUNY) at Buffalo – Roswell Park Cancer Institute medical branch campus in 2005. Her doctoral work focused on the synthesis and evaluation of new long-wavelength photosensitizing agents (700 nm purpurinimides and 800 nm bacteriopurpurinimides) for the detection and treatment of cancer via photodynamic therapy (PDT).

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name	Roxanne Jensen, Ph.D.
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Moderator

Roxanne E. Jensen, Ph.D. is a Health Services Researcher and Program Director in the Outcomes Research Branch of the Healthcare Delivery Research Program at the National Cancer Institute.

Dr. Jensen's research focuses on measuring patient-reported outcomes during and after cancer treatment, and the integration of patient generated health data into cancer clinical care settings. She has led multiple studies investigating best practices on how to collect, integrate, and report patient-reported outcomes in electronic health records to improve care quality. Dr. Jensen also coordinated the Measuring Your Health (MY-Health) study, a large SEER-linked cancer survivor cohort evaluating the validity and generalizability of using Patient-Reported Outcomes Information System (PROMIS) measures within and across cancer populations. Currently she is a science officer for the Improving Management of Symptoms Across Cancer Treatments (IMPACT) consortium, a Cancer Moonshot Initiative designed to evaluate the implementation of systematic symptom management in cancer care delivery.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name	Gregory Cooper, M.D., Ph.D.
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Research Interests:

- Application of decision theory, probability theory, Bayesian statistics, and artificial intelligence to biomedical informatics research problems
- Causal modeling and discovery from clinical and molecular data
- Personalized clinical outcome prediction
- Machine-learning approaches to improving patient safety
- Biosurveillance of disease outbreaks

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name Tina Hernandez-Boussard,
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Biomedical Data Science, and
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Dr Hernandez-Boussard is an Associate Professor in Medicine (Biomedical Informatics), Biomedical Data Science, and Surgery at the Stanford University School of Medicine. Dr. Hernandez-Boussard's background and expertise is in the field of computational biology, with concentration on accountability measures, population health, and health policy. A key focus of her research is the application of novel methods and tools to large clinical datasets for hypothesis generation, comparative effectiveness research, and the evaluation of quality healthcare delivery.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name	Paul Macklin, Ph.D.
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Paul Macklin is a mathematician, Associate Professor, and Director of Undergraduate studies in the recently-established Department of Intelligent Systems Engineering at Indiana University. His lab works with teams of biologists, modelers, and clinicians to develop and validate sophisticated computer models of multicellular systems, with a focus on cancer, tissue engineering, and synthetic systems. To drive this work, his lab develops open source tools for 3-D multicellular systems biology, including *BioFVM* (multi-substrate diffusive transport; DOI: [10.1093/bioinformatics/btv730](https://doi.org/10.1093/bioinformatics/btv730)) and *PhysiCell* (off-lattice agent-based modeling; DOI: [10.1371/journal.pcbi.1005991](https://doi.org/10.1371/journal.pcbi.1005991)). His lab also develops techniques to ease the use and increase the utility of agent-based modeling, including high-throughput investigations on HPC resources (DOI: [10.1186/s12859-018-2510-x](https://doi.org/10.1186/s12859-018-2510-x)), cloud-hosted interactive simulators (e.g., <https://nanohub.org/tools/pc4cancerbots/>), *ad hoc* small team crowdsourcing, and machine learning-driven model exploration.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name John Quackenbush, Ph.D.
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John Quackenbush is Professor of Computational Biology and Bioinformatics and Chair of the Department of Biostatistics at the Harvard TH Chan School of Public Health and Professor of Biostatistics and Computational Biology at the Dana-Farber Cancer Institute. John's PhD was in Theoretical Physics; in 1992 he received a fellowship from the National Institutes of Health to work on the Human Genome Project, which led him from the Salk Institute to Stanford University to The Institute for Genomic Research (TIGR) before moving to Harvard in 2005. John's research uses massive data from DNA sequencing and other assays to model functional networks in human cells. By comparing networks between groups of individuals, he has found new drug targets, explored chemotherapy resistance, and investigated differences between the sexes. He has made pioneering discoveries about how the genetic variants work together to determine our traits. John has published more than 280 papers; his work has been cited more than 65,000 times. He has received numerous awards for his work, including recognition in 2013 as a White House Open Science Champion of Change. He is also the co-founder of Genospace, a precision medicine software company that was purchased by the Hospital Corporation of America in 2017.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name	Amanda Randles, Ph.D.
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Amanda Randles is the Alfred Winborne Mordecai and Victoria Stover Mordecai Assistant Professor of Biomedical Engineering at Duke University. She has courtesy appointments in the departments of Mechanical Engineering and Material Science, Computer Science and Mathematics, and is a member of the Duke Cancer Institute. Amongst other recognitions, she has received the ACM Grace Murray Hopper Award, IEEE-CS Technical Consortium on High Performance Computing (TCHPC) Award, the NIH Director's Early Independence Award, the LLNL Lawrence Fellowship, and the ACM/IEEE George Michael Memorial High Performance Computing Fellowship. She was also named to the World Economic Forum Young Scientist List and the MIT Technology Review World's Top 35 Innovators under the Age of 35 list. Amanda received her Ph.D. in Applied Physics from Harvard University as a DOE Computational Graduate Fellow and NSF Fellow. Before that, she received her master's degree in Computer Science from Harvard University and her bachelor's degree in Computer Science and Physics from Duke University. Prior to graduate school, she worked as a software engineer at IBM on the Blue Gene supercomputing team. She has contributed over 40 peer-reviewed papers, over 100 granted US patents, and had over 100 pending patent applications.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name **William G. Richards, Ph.D.**
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Although Dr. Richards' particular research focus concerns the molecular prognosis, classification and staging of lung cancer and mesothelioma, he has broad experience bridging basic and clinical human subjects cancer research and has been an active participant in the development of biospecimen science. He has implemented and analyzed a patient specimen and data registry for the International Mesothelioma Program at Brigham and Women's, resulting in comprehensive evaluation of genomic, prognostic and staging criteria for this rare disease. Serving on the Surgery, Pathology, Respiratory and Translational Research committees of the Alliance for Clinical Trials in Oncology (formerly CALGB), he led a CALGB protocol that resulted in a prospective multi-institutional lung cancer specimen and data bank. Hosted in an institutional biorepository core that Dr. Richards directs at Brigham and Women's, the lung bank represents one of the NCI's National Clinical Trial Network Biospecimen Banks. Dr. Richards has long served on the Steering Committee and chairs the Best Practices and Operations subcommittee for the NCTN Banks, and in this capacity has led an effort to create a digital pathology network across the NCTN to make annotated whole slide images from NCTN trial specimens available to the cancer community for correlative research.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name	Ilya Shmulevich, Ph.D.
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Ilya Shmulevich received his Ph.D. in Electrical and Computer Engineering from Purdue University, West Lafayette, IN, in 1997. From 1997-1998, he was a postdoctoral researcher at the Nijmegen Institute for Cognition and Information at the University of Nijmegen and National Research Institute for Mathematics and Computer Science at the University of Amsterdam in The Netherlands, where he studied computational models of music perception and recognition. In 1998-2000, he worked as a senior researcher at the Tampere International Center for Signal Processing at the Signal Processing Laboratory in Tampere University of Technology, Tampere, Finland. From 2001-2005, he was an Assistant Professor at the Cancer Genomics Laboratory in the Department of Pathology at The University of Texas M. D. Anderson Cancer Center and an Adjunct Professor in the Department of Statistics in Rice University.

Presently, he is a Professor at The Institute for Systems Biology, where he has directed a Genome Data Analysis Center as part of The Cancer Genome Atlas (TCGA) project. He is an Affiliate Professor in the Departments of Bioengineering and Electrical Engineering at the University of Washington, Department of Signal Processing in Tampere University of Technology, Finland, and Department of Electronic and Electrical Engineering in Strathclyde University, Glasgow, UK. His current main research area is multiscale modeling for cancer therapy.

SESSION 2: CHALLENGE AREAS IN CANCER RESEARCH



Name Amber Simpson, Ph.D.
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The objective of my work is to develop robust quantitative imaging techniques (called radiomics) for patients with liver and pancreas cancer, for which we have promising preliminary results. The development of robust imaging markers is a key step in our long-term goal of quantitative imaging to inform cancer treatment and prognosis, so this proposal fits well with my current work. Our quantitative imaging work started when I was a Visiting Professor from Vanderbilt University. I developed quantitative imaging methods for predicting liver dysfunction from preoperative CT imaging, which stimulated significant interest at Memorial Sloan Kettering. As a result, I was recruited to join the faculty as the first PhD-only in the Department of Surgery. Many other quantitative imaging projects followed: prediction of hepatic recurrence, prediction of response to neoadjuvant/adjuvant chemotherapy, radiogenomics of cholangiocarcinoma, pancreatic ductal adenocarcinoma survival prediction, and others.

SESSION 3: DOE CAPABILITIES AND RESEARCH



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Moderator

Dr. Carolyn Vea Lauzon serves in the Department of Energy, Office of Science, Office of Advanced Scientific Computing Research. Carolyn is the Facilities Program Manager for the NERSC high performance computing facility at Lawrence Berkeley National Laboratory and the DOE Office of Science lead for DOE partnerships with the National Institutes of Health and the Department of Veterans Affairs. Before joining federal service, Carolyn completed her post-doctoral fellowship in Computational Medical Image Analysis at Vanderbilt University and received her PhD in Molecular Biophysics from the Johns Hopkins School of Medicine.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name Eric Stahlberg, Ph.D.
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Moderator

Dr. Stahlberg is the Director of Biomedical Informatics and Data Science (BIDS) at Frederick National Laboratory for Cancer Research (FNLCR). He has been instrumental in establishing the Frederick National Laboratory's high-performance computing initiative and in assembling scientific teams across multiple, complex organizations to advance predictive oncology.

Stahlberg first joined the Frederick National Laboratory in 2011 to form and direct the National Cancer Institute (NCI)'s Center for Cancer Research Bioinformatics Core, which helped build intramural research collaborations between the national laboratory and NCI.

Since then, Stahlberg has played a leadership role in many key partnerships, including a major collaboration between the NCI and the Department of Energy (DOE). Under the *Joint Design of Advanced Computing Systems for Cancer (JDACS4C)*, NCI and DOE are accelerating progress in precision oncology and computing. The collaboration is rooted in three major national initiatives; the Precision Medicine Initiative, the National Strategic Computing Initiative, and the Cancer Moonshot.

Stahlberg has spearheaded the Frederick National Laboratory's contributions to a number of JDACS4C projects, including ATOM and CANDLE. He helped launch and support the annual meeting series, Frontiers in Predictive Oncology and Computing. In 2017, he was recognized as one of FCW's Federal 100. Stahlberg holds a Ph.D. in computational chemistry from The Ohio State University.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name Francis J. Alexander,
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Frank Alexander is the Deputy Director of the Computational Science Initiative at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory. Prior to that Frank was at Los Alamos National Laboratory, where he was the acting division leader of the Computer, Computational, and Statistical Sciences (CCS) Division. During his more than 20 years at Los Alamos, he held several leadership roles, including as deputy leader of the CCS Division's Information Sciences Group and leader of the Information Science and Technology Institute. Alexander first joined Los Alamos in 1991 as a postdoctoral researcher at the Center for Nonlinear Studies. He returned to Los Alamos in 1998 after doing postdoctoral work at the Institute for Scientific Computing Research at DOE's Lawrence Livermore National Laboratory and serving as a research assistant professor at Boston University's Center for Computational Science. Frank's current research interests include optimal design of experiments, computational physics, and nonequilibrium statistical mechanics. Frank has a PhD in Physics from Rutgers University and a B.S. degree in physics and mathematics from The Ohio State University. He has led many research projects and has published more than 50 papers in peer reviewed journals.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name	Silvia Crivelli, Ph.D.
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For the past 20 years I have conducted research at the intersection of structural biology, high-performance computing, human-computer interaction, and applied math. More recently, I have been working on the design and implementation of deep learning methods to advance protein scoring and QA in the context of protein structure prediction and drug design and plan to apply these methods in the context of RAS oncoprotein research. Also, I am the LBL technical lead of a DOE-VA Million Veterans Program project to integrate structured and unstructured data from electronic health records as well as genomic data from hundreds of thousand veterans to develop patient-specific diagnostic strategies to improve health care for veterans, with emphasis on suicide prevention, cardio vascular disease and prostate cancer.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name John Feddema, Ph.D.
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Dr. John Feddema is the Senior Manager of Sandia National Laboratories' Enhanced Decision Making Group. His organization is responsible for scalable analysis and visualization, machine intelligence, optimization and uncertainty quantification, discrete math and optimization, and scalable algorithms. Prior to this position, John was the manager of the Data Analysis and Exploitation Department in Sandia's Space Mission business area. His responsibilities included being the program manager of the Advanced System Program Ground System Research portfolio, which focused on the development of new signal and image processing capabilities for current and future satellite ground systems. Prior to 2008, John was the manager of the Intelligent Systems Control Department from 2003 to 2008, and he was a Distinguished Member of Technical Staff from 1998 to 2003. John has over 80 publications in journals, conference proceedings, and book chapters. He has eight patents in sway-control of cranes, hopping robots, and distributed autonomous robot control. John Feddema received his Ph.D. degree in Electrical Engineering from Purdue University in 1989.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name	Sarah Michalak, Ph.D.
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Dr. Sarah Michalak is a statistician with the Statistical Sciences Group at Los Alamos National Laboratory.

During her tenure at the laboratory, Dr. Michalak has successfully led multi-disciplinary research projects focused on emerging computer hardware reliability issues and on the interaction of computer engineering, computer science, and statistics to enable real-time/near-real-time processing. She has further been an energetic contributor to cross-disciplinary research teams in areas including probabilistic computing, the efficient use of high-performance computing platforms, large-scale epidemic modeling, and bio-surveillance.

Dr. Michalak's current research focuses on predictive oncology and novel computing paradigms. She earned her Ph.D. in Statistics from Harvard University and her B.A. in Mathematics from Yale University.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name	Ana Paula de Oliveira Sales, Ph.D.
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Dr. Sales is a research scientist in the Applied Statistics Group at LLNL. She is currently leading two research efforts at LLNL on modeling population-level cancer patient data: she is the LLNL lead on the NCI-DOE “Population Information, Integration, Analysis and Modeling” pilot project, and the PI on a project in partnership with the Cancer Registry of Norway developing multitask learning models for predictive oncology. She is also the data modeling lead on a highly interdisciplinary team developing a “brain-on-a-chip.”

Dr. Sales obtained her master’s degree in Statistical Science and Ph.D. in Computational Biology in 2011 from Duke University. She subsequently joined LLNL as a postdoctoral fellow and is now a member of the technical staff. During her tenure at LLNL, Dr. Sales has led and contributed to several projects, developing statistical and machine learning models for diverse biomedical applications.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name **Robert Rallo, Ph.D.**
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Dr. Robert Rallo leads the Data Sciences Group in the Advanced Computing, Mathematics, and Data Division at Pacific Northwest National Laboratory. Prior to joining PNNL, he was an Associate Professor in Computer Science and Artificial Intelligence and Director of the Advanced Technology Innovation Center (ATIC) at the Universitat Rovira i Virgili in Catalonia. Dr. Rallo served as chair for the Modeling WG in the EU NanoSafety Cluster (2013-2016) and as the EU co-chair of the US-EU Nano-Dialogue Community of Research on Predictive Modeling and Health (2013-2015). He served also as reviewer for research organizations such as the European Research Council, Horizon2020, COST and the NWO Research Council for Earth and Life Sciences (ALW). Dr. Rallo's research interests are in data-driven analysis and modelling of complex systems of relevance for DOE mission.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name	Rick Stevens
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Since 1999, Rick Stevens has been a professor at the University of Chicago and since 2004, an Associate Laboratory Director at Argonne National Laboratory. He is internationally known for work in high-performance computing, collaboration and visualization technology, and for building computational tools and web infrastructures to support large-scale genome and metagenome analysis for basic science and infectious disease research. He teaches and supervises students in the areas of computer systems and computational biology. He co-leads the DOE national laboratory group that has been developing the national initiative for Exascale computing.

Stevens is principal investigator for the NIH/NIAID supported PATRIC Bioinformatics Resource Center which is developing comparative analysis tools for infectious disease research and serves a large user community. Stevens is also the PI of The Exascale Deep Learning and Simulation Enabled Precision Medicine for Cancer project through the Exascale Computing Project (ECP), which focuses on building a scalable deep neural network code called the CANcer Distributed Learning Environment (CANDLE) to address three top challenges of the National Cancer Institute. Stevens is also one of the PIs for the DOE-NCI Joint Design of Advanced Computing Solutions for Cancer project, part of the Cancer Moonshot initiative. In this role, he leads a pilot project on pre-clinical screening aimed at building machine learning models for cancer drug response that will integrate data from cell line screens and patient derived xenograft models to improve the range of therapies available to patients.

SESSION 3: DOE CAPABILITIES AND RESEARCH



Name	Georgia Tourassi, Ph.D.
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Dr. Georgia Tourassi is the founding Director of the Health Data Sciences Institute and Group Leader of Biomedical Sciences, Engineering and Computing at the Oak Ridge National Laboratory (ORNL). Concurrently, she holds appointments as an adjunct Professor of Radiology at Duke University and the University of Tennessee and as a joint UT-ORNL Professor of Mechanical, Aerospace, and Biomedical Engineering at the University of Tennessee at Knoxville. Her research interests include medical imaging, biomedical informatics, clinical decision support systems and data-driven biomedical discovery. She serves on the FDA Advisory Committee and Review Panel on Computer-Aided Diagnosis Devices and she has been appointed Charter member of two NIH Study sections. Her scholarly work has led to 9 US patents and innovation disclosures and more than 230 peer-reviewed journal articles, conference proceedings articles, and book chapters.

Her research in medical imaging has been featured in numerous high-profile publications such as the MIT Science and Technology Review, Oncology Times and the Economist. Dr. Tourassi has served as Associate Editor of the scientific journals Radiology and Neurocomputing, and as a Guest Associate Editor of Medical Physics. She is elected Fellow of the American Institute of Medical and Biological Engineering (AIMBE), the American Association of Medical Physicists (AAPM) and the International Society for Optics and Photonics (SPIE). For her leadership in the Joint Design of Advanced Computing Solutions for Cancer initiative, she recently received the DOE Secretary's Appreciation Award. Dr. Tourassi holds a B.S. degree in Physics from Aristotle University of Thessaloniki, Greece and a Ph.D. in Biomedical Engineering from Duke University.

KEYNOTE PRESENTATION: BLUE SKY POSSIBILITIES AT THE INTERSECTION OF ONCOLOGY AND COMPUTING



Name

Warren Alden Kibbe, Ph.D.

Title

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Keynote Speaker

Warren A. Kibbe, PhD, is chief for Translational Biomedical Informatics in the Department of Biostatistics and Bioinformatics and Chief Data Officer for the Duke Cancer Institute. He joined the Duke University School of Medicine in August after serving as the acting deputy director of the National Cancer Institute (NCI) and director of the NCI's Center for Biomedical Informatics and Information Technology where he oversaw 60 federal employees and more than 600 contractors and served as an acting Deputy Director for NCI. As an acting Deputy Director, Dr. Kibbe was involved in the myriad of activities that NCI oversees as a research organization, as a convening body for cancer research, and as a major funder of cancer research, funding nearly \$4B US annually in cancer research throughout the United States.

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