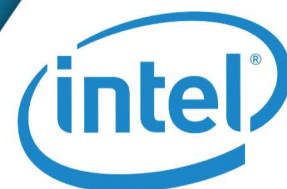# FRONTIERS OF PREDICTIVE ONCOLOGY & COMPUTING II

Biological Applications of Advanced Strategic Computing (BAASiC)

From Pathology to Computation – The Path to Dynamic Models for Cancer

October 17–19, 2017 • Agenda Packet

SUNY Global Center
116 E 55th Street
New York, NY 10022

WiFi
Network: SUNYGuest
Password: suny3485

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From Pathology to Computation – The Path to Dynamic Models for Cancer

October 17-19, 2017
SUNY Global Center, New York, NY
Limited Capacity: Participation by Invitation Only

Primary Goals for the Meeting

- Bring together experts from industry, government, and academia working across the combined frontiers of pathology, radiology (multi-scale imaging), predictive oncology and computing
- Provide insight into existing challenges and efforts to address challenges where multi-scale imaging, predictive oncology and computing share common opportunities
- Provide opportunities to share in discussion of new opportunities arising from new ideas for collaborations, cross-disciplinary education, and shared efforts to accelerate cancer research and clinical application of research advances
- Bring focus to the role of "computational pathology" across multiple time and length scales and areas of application ranging from digital pathology to opportunities in drug discovery and integrated multiscale modeling
- Share future visions from multiple perspectives to develop a common appreciation for the integrated role domain knowledge, technology, and information will play in the future for computationally predictive oncology

Meeting History

The Frontiers of Predictive Oncology and Computing meeting is an annual event tying its origins to the original Biological Applications of Advanced Strategic Computing meetings initiated by Livermore National Laboratory. Bringing a specific focus to the challenges and opportunities for cancer, the first Frontiers of Predictive Oncology and Computing meeting was held July 2016 in Washington DC. At this meeting over 100 thought leaders from industry, government and academia converged to share insights, knowledge and vision for the future of computationally predictive oncology.

This Year's Meeting

The second Frontiers of Predictive Oncology and Computing meeting brings focus to the topic of "computational pathology", discussing the broader application of technology, computation and domain expertise to understand and describe the specifics of cancer as a disease. With origins in digital pathology, extended in recent years to include molecular level signatures through sequencing and other forms of enhanced observation, the concept of "computational pathology" embraces the dynamic range of options from virtual microscopy to molecular to probe cancer and capture observations of disease behaviors across space and time scales. The Frontiers of Predictive Oncology and Computing meeting brings context to these methods of observation, providing insight into the key role the collected information plays in the development of computationally predictive oncology models and methods.

Specific topical areas to be discussed include:

- Longitudinal multi-modal data in predictive oncology - Pre-diagnosis, detection, and post-diagnosis monitoring
- Multiscale data in predictive oncology – From molecular, cellular, and tumor, to organ, tissue, body, and population
- Clinical and commercial applications - Predictive oncology applied (metastasis, treatment decisions, treatment development, etc.)
- Computational frontiers - HPC, sensors, edge computing

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Day One – Tuesday, October 17, 2017

8:00 AM   **Arrival and check-in** at the SUNY Global Reception Center to receive badge

Registration and continental breakfast   Global Classroom

9:00 AM   **Welcome & Introductory Remarks**   Global Classroom

Emily Greenspan, PhD

Program Director, Center for Biomedical Informatics and Information Technology (CBIIT), National Cancer Institute (NCI)

Dimitri Kusnezov, PhD

Chief Scientist & Senior Advisor to the Secretary, National Nuclear Security Administration (NNSA), Department of Energy (DOE)

Joel Saltz, MD, PhD

Cherith Professor and Founding Chair, Department of Biomedical Informatics, Vice President for Clinical Informatics, Stony Brook Medicine, Associate Director, Stony Brook University Cancer Center

Robert Harrison, PhD

Professor in Applied Mathematics and Statistics, Director of the Institute for Advanced Computational Science, State University of New York (SUNY) Stony Brook University Director, Computational Science Center and New York Center for Computational Sciences, Brookhaven National Laboratory

9:15 AM   **Meeting Overview – Computational Pathology and Predictive Oncology**

Joel Saltz, MD, PhD

Cherith Professor and Founding Chair, Department of Biomedical Informatics, Vice President for Clinical Informatics, Stony Brook Medicine, Associate Director, Stony Brook University Cancer Center

9:30 AM   **Keynote – Cancer Moonshot – One Year Later**

Jerry Lee, PhD

Deputy Director, Center for Strategic Scientific Initiative, National Cancer Institute (NCI) Deputy Director, for Cancer Research and Technology, Cancer Moonshot Task Force

10:15 AM   ***Break – networking***

Day One – Tuesday, October 17, 2017 - Continued

10:30 AM **Plenary Session – Drivers for Predictive Oncology Impacting Computational Pathology – Patients, Treatments, and Improving Outcomes**

Moderators: Joel Saltz, MD, PhD

Cherith Professor and Founding Chair, Department of Biomedical Informatics, Vice President for Clinical Informatics, Stony Brook Medicine, Associate Director, Stony Brook University Cancer Center

Janet Eary, MD

Deputy Associate Director, Cancer Imaging Program, National Cancer Institute (NCI)

John Baldoni, PhD

Senior Vice President of R&D, GlaxoSmithKline

Kun Huang, PhD

Assistant Dean for Data Sciences, IUSM PHI Chair for Genomics Data Sciences, Professor of Medicine, Indiana University

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12:00 PM *Lunch* Global Classroom

1:30 PM **Plenary Session – Frontier Technologies to Probe Biology – Unlocking Frontiers of Computational Pathology**

Moderator: Robert Harrison, PhD

Professor in Applied Mathematics and Statistics, Director of the Institute for Advanced Computational Science, State University of New York (SUNY) Stony Brook University, Director, Computational Science Center and New York Center for Computational Sciences, Brookhaven National Laboratory

Fiona Ginty, PhD

Biosciences Technical Operations Leader & Principal Investigator, GE Global Research Center

John Condeelis, PhD

Professor & Co-Chair of Anatomy & Structural Biology, The Judith and Burton P. Resnick Chair in Translational Research, Co-Director, Gruss Lipper Biophotonics Center, Co-Director, Integrated Imaging Program, Director, Tumor Microenvironment and Metastasis Program, Scientific Director, Analytical Imaging Facility, Albert Einstein Cancer Center

Maja Oktay, MD, PhD

Professor, Department of Pathology, Department of Anatomy & Structural Biology, Albert Einstein Cancer Center

Vesteinn Thorsson, PhD

Senior Research Scientist, Institute for Systems Biology

Day One – Tuesday, October 17, 2017 - Continued

3:00 PM   *Break – networking*

3:30 PM   **Panel Session – Exploring the Frontiers of Computing and the Future of Computational Pathology**

Moderator: Mark Seager, PhD
Intel Fellow, Chief Technology Officer for the High Performance Computing (HPC) Ecosystem, Intel Corporation

Tahsin Kurc, PhD
Vice Chair and Research Associate Professor, Department of Biomedical Informatics, Stonybrook University

Scott Hammond, MD
Director of Strategy, Outlier Initiative / Smarter Health, CDHI Expert in Residence, University of California, San Francisco

Fred Streitz, PhD
Chief Computational Scientist, Physical and Life Sciences Directorate, Director, High Performance Computing Innovation Center (HPCIC), Lawrence Livermore National Laboratory

Warren Kibbe, PhD
Chief of Translational Biomedical Informatics, Department of Biostatistics and Bioinformatics, Chief Data Officer, Duke University School of Medicine

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5:00 PM   **Adjourn - Social Networking Opportunity**

Evening on own – dinner on own

Day Two – Wednesday, October 18, 2017

8:00 AM **Arrival and check-in** at the SUNY Global Reception Center to receive badge

Registration and continental breakfast Global Classroom

8:45 AM **Welcome & Recap** Global Classroom

Emily Greenspan, PhD
Program Director, Center for Biomedical Informatics and Information Technology (CBIIT), National Cancer Institute (NCI)

Dimitri Kusnezov, PhD
Chief Scientist & Senior Advisor to the Secretary, National Nuclear Security Administration (NNSA), Department of Energy (DOE)

Joel Saltz, MD, PhD
Cherith Professor and Founding Chair, Department of Biomedical Informatics, Vice President for Clinical Informatics, Stony Brook Medicine, Associate Director, Stony Brook University Cancer Center

Robert Harrison, PhD
Professor in Applied Mathematics and Statistics, Director of the Institute for Advanced Computational Science, State University of New York (SUNY) Stony Brook University Director, Computational Science Center and New York Center for Computational Sciences, Brookhaven National Laboratory

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9:00 AM **Keynote – Towards a Digital Pathology Commons**

Michael Becich, MD, PhD
Associate Vice-Chancellor for Informatics in the Health Sciences, Chairman and Distinguished University Professor, Department of Biomedical Informatics, Associate Director, University of Pittsburgh Medical Center (UPMC) Hillman Cancer Center

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10:00 AM ***Break – networking***

Day Two – Wednesday, October 18, 2017 - Continued

10:15 AM　　**Plenary Session – Joint Design of Advanced Computing Solutions for Cancer (JDACS4C): Frontier Collaborations in Predictive Oncology and Computing**

Moderators: Amy Gryshuk, PhD

Director, Strategic Engagements & Alliance Management, Physical & Life Sciences Directorate (PLS), Biosciences & Biotechnology Division (BBTD), Lawrence Livermore National Laboratory

Eric Stahlberg, PhD

Director, Strategic and Data Science Initiatives, Data Science and Information Technology Program, Frederick National Laboratory / Leidos Biomedical Research, Inc.

Molecular Scale Predictive Oncology

Dwight Nissley, PhD

Director, Cancer Research Technology Program, Frederick National Laboratory / Leidos Biomedical Research, Inc.

Fred Streitz, PhD

Chief Computational Scientist, Physical and Life Sciences Directorate, Director, High Performance Computing Innovation Center, Lawrence Livermore National Laboratory

Pre-clinical Scale Predictive Oncology

Yvonne Evrard, PhD

Operations Manager, NCI Patient-Derived Models Repository Frederick National Laboratory / Leidos Biomedical Research, Inc.

Rick Stevens, PhD

Associate Laboratory Director - Computing, Environment and Life Sciences, Argonne National Laboratory

Population Scale Predictive Oncology

Paul Fearn, PhD MBA

Chief, Division of Cancer Control and Population Sciences, Surveillance Informatics Branch, National Cancer Institute (NCI)

Georgia Tourassi, PhD

Director, Health Data Sciences Institute, Oak Ridge National Laboratory

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12:00 PM　　*Lunch*

Day Two – Wednesday, October 18, 2017 - Continued

1:00 PM   **Computing Frontiers: JDACS4C Cross-cutting Technologies**

Uncertainty Quantification
Tanmoy Bhattacharya, PhD
External Professor and Scientist, Los Alamos National Laboratory

CANDLE – CANcer Distributed Learning Environment
Rick Stevens, PhD
Associate Laboratory Director - Computing, Environment and Life Sciences, Argonne National Laboratory

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1:45 PM   ***Break***

2:00 PM   **Panel Session – Longitudinal and Multiscale Data: Challenges and Opportunities for Computational Pathology**

Moderators: Rachael Calcutt, MD, MSPH
Associate Professor of Surgery, Trauma, Critical Care & General Surgery, University of California, San Francisco

Scott Hammond, MD
Director of Strategy, Outlier Initiative / Smarter Health, CDHI Expert in Residence, University of California, San Francisco

Carlos Cordon-Cardo, MD, PhD
Professor and Chairman, Department of Pathology, Professor, Departments of Genetics and Genomic Sciences and Oncological Sciences, Icahn School of Medicine at Mount Sinai

Chakra Chennubhotla, PhD
Associate Professor, Department of Computational and Systems Biology, University of Pittsburgh Medical Center

John Gilbertson, MD
Associate Professor, Harvard Medical School
Associate Chief of Pathology, Director of Pathology Informatics, Massachusetts General Hospital

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3:00 PM   ***Break – networking (Global Classroom to be reset for Breakout Sessions)***

Biological Applications of Advanced Strategic Computing (BAASiC) Meeting

Day Two – Wednesday, October 18, 2017 - Continued

3:15 PM   **Breakout Sessions**

	Session Name	Room Location
Session I	Informing Cancer Treatments with Computational Predictive Oncology	Global Classroom, Side 1
Session II	Predictive Oncology Algorithms and Software – Challenges, Opportunities and Paths Forward	Global Classroom, Side 2
Session III	Evolving Role of Pathology, Tissue and Biospecimen Data in Predictive Oncology and Analytics	Multipurpose Room – 2nd Floor

4:45 PM   ***Break – networking (Global Classroom to be reset for Wrap-up Session)***

5:00 PM   **Wrap-Up & Social Event Information**   Global Classroom

5:15 PM   **Adjourn**

Social Event

7:00 PM   **Meeting Dinner, *Angus Club Steakhouse,* 135 E 55 Street, Manhattan, NY 10022**
                    Reservation under 'FPOC'. Business casual attire. Open seating format. Cash bar.

Day Three – Thursday, October 19, 2017

8:00 AM   **Arrival and check-in** at the SUNY Global Reception Center to receive badge

   Registration and continental breakfast   Global Classroom

8:45 AM   **Welcome & Introductory Remarks**   Global Classroom

   Emily Greenspan, PhD
   Program Director, Center for Biomedical Informatics and Information Technology (CBIIT), National Cancer Institute (NCI)

   Dimitri Kusnezov, PhD
   Chief Scientist & Senior Advisor to the Secretary, National Nuclear Security Administration (NNSA), Department of Energy (DOE)

   Joel Saltz, MD, PhD
   Cherith Professor and Founding Chair, Department of Biomedical Informatics, Vice President for Clinical Informatics, Stony Brook Medicine, Associate Director, Stony Brook University Cancer Center

   Robert Harrison, PhD
   Professor in Applied Mathematics and Statistics, Director of the Institute for Advanced Computational Science, State University of New York (SUNY) Stony Brook University Director, Computational Science Center and New York Center for Computational Sciences, Brookhaven National Laboratory

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9:00 AM   **Keynote – Learning from Industry Challenges in Multiscale Analytics and Relevance to Cancer Research and Imaging**

   Michael Idelchik
   Vice President, Advanced Technology Programs, General Electric

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9:30 AM   ***Break – networking (Global Classroom to be reset for Breakout Sessions)***

Biological Applications of Advanced Strategic Computing (BAASiC) Meeting

Day Three – Thursday, October 19, 2017

9:45 AM   **Individual Breakout Session Conclusion and Preparation**

10:15 AM   *Break – networking (Global Classroom to be reset for Facilitated Discussion)*

10:30 AM   **Facilitated Discussion on Breakouts**

   Moderator: Mike Gann
   Director, Global Healthcare, Intel Corporation

11:30 AM   **Next Steps and Meeting Wrap-up**

   Emily Greenspan, PhD
   Program Director, Center for Biomedical Informatics and Information Technology (CBIIT), National Cancer Institute (NCI)

   Dimitri Kusnezov, PhD
   Chief Scientist & Senior Advisor to the Secretary, National Nuclear Security Administration (NNSA), Department of Energy (DOE)

   Joel Saltz, MD, PhD
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   Robert Harrison, PhD
   Professor in Applied Mathematics and Statistics, Director of the Institute for Advanced Computational Science, State University of New York (SUNY) Stony Brook University Director, Computational Science Center and New York Center for Computational Sciences, Brookhaven National Laboratory

12:00 PM   **Meeting Adjournment**