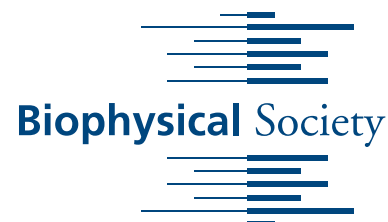


# Genome Biophysics:

Integrating Genomics and Biophysics to Understand Structural and Functional Aspects of Genomes

.....  
Santa Cruz, California | August 19–24, 2018



## Organizing Committee

Sarah Harris, University of Leeds, United Kingdom  
Stephen Levene, University of Texas at Dallas, USA  
Julia Salzman, Stanford University, USA  
Massa Shoura, Stanford University, USA

Scientific sessions will be held in the Santa Cruz Room and poster sessions will be held in the New Brighton Room, unless otherwise noted.

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## Sunday, August 19, 2018

15:00 – 18:00	<b>Registration/Information</b> .....	<b>Santa Cruz Room</b>
18:00 – 19:00	<b>Welcome Reception</b> .....	<b>Courtyard Terrace</b>
19:00 – 20:00	<b>Dinner</b> .....	<b>Sunset Restaurant</b>

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## Monday, August 20, 2018

8:30 – 17:00	<b>Registration/Information</b> .....	<b>Santa Cruz Room</b>
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### Session I

#### **Junk or Not Junk: Structure and Sequence of Coding and Noncoding DNA**

Sarah Harris, University of Leeds, United Kingdom, Chair

9:00 – 9:45	Sergei Mirkin, Tufts University, USA <b><i>RNA-DNA Hybrids Promote the Expansion of Friedreich's Ataxia (GAA)<sub>n</sub> Repeats via Break-induced Replication</i></b>	
9:45 – 10:30	David Levens, NIH, USA <b><i>The Regulatory Roles of DNA Topology and Conformation in Mammalian Gene Expression</i></b>	
10:30 – 10:50	<b>Coffee Break</b> .....	<b>Seacliff Lounge &amp; Terrace</b>
10:50 – 11:10	Anton Goloborodko, MIT, USA* <b><i>A Pathway for Mitotic Chromosome Formation</i></b>	
11:10 – 11:55	Charles Dorman, Trinity College, Ireland <b><i>Bacterial Decision-making Operating Through Tuneable Binary Genetic Switches</i></b>	
12:00 – 14:00	<b>Lunch</b> .....	<b>Sunset Restaurant</b>

### Session II

#### **Biophysical Approaches to Understanding Chromatin Structure**

Stephen Levene, University of Texas at Dallas, USA, Chair

14:00 – 14:45	Wilma Olson, Rutgers University, USA <b><i>Contributions of DNA Sequence in 3D Genomic Architectures</i></b>	
14:45 – 15:30	Tamar Schlick, New York University, USA <b><i>Modeling Gene Elements at Nucleosome Resolution</i></b>	
15:30 – 15:50	<b>Coffee Break</b> .....	<b>Seacliff Lounge &amp; Terrace</b>
15:50 – 16:35	Andrzej Stasiak, University of Lausanne, Switzerland <b><i>Transcription-induced Supercoiling and TADs Formation</i></b>	
16:35 – 17:20	Karsten Rippe, Heidelberg University, Germany <b><i>Establishing Chromatin Subcompartments That Are Both Stable and Plastic</i></b>	
17:20 – 18:00	<b>Nature Hike</b> .....	<b>Chaminade Red &amp; Blue Trails</b>
18:00 – 20:00	<b>Dinner</b> .....	<b>Sunset Restaurant</b>

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## Tuesday, August 21, 2018

8:30 – 17:00	<b>Registration/Information</b> .....	<b>Santa Cruz Room</b>
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### Session III

#### **Exploring the Physical Genome I**

Wilma Olson, Rutgers University, USA, Chair

9:00 – 9:45	Javier Arsuaga, University of California, Davis, USA <b><i>Biophysical Models of DNA Organization inside Viral Capsids</i></b>	
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9:45 – 10:30	Shinichi Morishita, University of Tokyo, Japan <b>Understanding Tandem Repeats and Methylation with Long-read Sequencing</b>	
10:30 – 10:50	<b>Coffee Break</b> .....	Seacliff Lounge & Terrace
10:50 – 11:10	Thomas Bishop, Louisiana Tech University, USA* <b>G-Dash: A Genomics Dashboard that Unites Physics and Informatics Studies of Chromatin</b>	
11:10 – 11:55	Alexandra Zidovska, New York University, USA <b>The “Self-stirred” Genome: Bulk and Surface Dynamics of the Chromatin Globule</b>	
12:00 – 14:00	<b>Lunch</b> .....	Sunset Restaurant

#### Session IV

#### Exploring the Physical Genome II

Stephen Levene, University of Texas at Dallas, USA, Chair

14:00 – 14:45	Xaiver Darzacq, University of California, Berkeley <b>Nuclear Organization and Transcription Regulation Mechanisms Studied by Live Cell Imaging</b>	
14:45 – 15:30	Martin Depken, Delft University of Technology, The Netherlands <b>Bottom-up Physical Modelling for CRISPR/Cas Target Prediction</b>	
15:30 – 15:50	<b>Coffee Break</b> .....	Seacliff Lounge & Terrace
15:50 – 16:35	Laura Landweber, Columbia University, USA <b>RNA-programmed Genome Rearrangement in the Ciliate Oxytricha</b>	
16:35 – 16:55	Katerina Kraft, Stanford University, USA* <b>Genomic Rearrangement Induced Gene Activation by Architectural Stripes</b>	
17:00 – 18:00	David Schwartz, University of Wisconsin, USA <b>From Big DNA Molecules to Big Data</b> Keynote Speaker	
18:00 – 20:00	<b>Dinner</b> .....	Sunset Restaurant

## Wednesday, August 22, 2018

8:30 – 17:00	<b>Registration/Information</b> .....	Santa Cruz Room
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#### Session V

#### Fundamental Limits of Sequencing Accuracy, Sensitivity, and Uniqueness: What Do, and What Don't, We Know?

Marc Salit, NIST, USA, Chair

9:00 – 9:45	Marc Salit, NIST, USA <b>Metrology of Genome-scale Measurements: Standards and Systematics to Get Comparability and Confidence</b>	
9:45 – 10:05	Miten Jain, University of California, Santa Cruz, USA* <b>A Reference Human Transcriptome Based on Native RNA Sequencing</b>	
10:05 – 10:25	Idan Gabdank, Stanford University, USA* <b>Portable and Reproducible Computational Analyses</b>	
10:25 – 10:50	<b>Coffee Break</b> .....	Seacliff Lounge & Terrace
10:50 – 11:10	Stephen Lincoln, Invitae, USA* <b>Complex Genetic Variants: Implications for Clinical Sequencing Methods and Validation Approaches</b>	
11:10 – 12:00	<b>Formal Discussions</b>	
12:00 – 14:00	<b>Lunch</b> .....	Sunset Restaurant

#### Session VI

#### Single-cell Genomics and Single-Molecule Sequencing

Tim J. Stevens, MRC Laboratory of Molecular Biology, United Kingdom, Chair

14:00 – 14:45	Tim J. Stevens, MRC Laboratory of Molecular Biology, United Kingdom <b>Capturing the 3D Folds of Whole Mammalian Genomes in Single Cells</b>	
14:45 – 15:30	Bo Wang, Stanford University, USA <b>Self-assembling Manifolds in Single-Cell RNA Sequencing Data</b>	
15:30 – 16:15	Cristian Micheletti, SISSA Trieste, Italy <b>Nanopore Translocation of Knotted DNA</b>	
16:15 – 18:00	<b>Poster Session</b>	

18:00 – 20:00	Dinner .....	Sunset Restaurant
20:00	Pool Night.....	Resort Pool

## Thursday, August 23, 2018

8:30 – 17:00	Registration/Information .....	Santa Cruz Room
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### Session VII

#### The RNA World: Structure, Dynamics, and Interaction

Andrew Fire, Stanford University, USA, Chair

9:00 – 9:45	Andrew Fire, Stanford University, USA <i>Long-term RNA-based Transmission of Biological States</i>	
9:45 – 10:30	Alan Lambowitz, University of Texas at Austin, USA <i>Thermostable Group II Intron Reverse Transcriptases (TGIRTs) and Their Use in RNA-seq</i>	
10:30 – 10:50	Coffee Break.....	Seacliff Lounge & Terrace
10:50 – 11:10	Priscilla L. Boon, National University of Singapore* <i>How Dengue Capsid Protein Assists in Organizing Dengue Virus Genomic RNA</i>	
11:10 – 11:55	Sarah Woodson, Johns Hopkins University, USA <i>Sequential Folding of RNA</i>	
12:00 – 14:00	Lunch .....	Sunset Restaurant

### Session VIII

#### Genomics of Gene Regulation

Massa Shoura, Stanford University, USA, Chair

14:00 – 14:45	Nadav Ahituv, University of California, San Francisco, USA <i>Functional Characterization of Gene Regulatory Elements</i>	
14:45 – 15:30	Polly Fordyce, Stanford University, USA <i>Quantitative Mapping of Transcription Factor Binding Energy Landscapes</i>	
15:30 – 15:50	Coffee Break.....	Seacliff Lounge & Terrace
15:50 – 16:35	Zeba Wunderlich, University of California, Irvine, USA <i>Noise in the Shadows</i>	
16:35 – 16:55	Ariel Afek, Duke University, USA* <i>Mismatched Base-pairs Locally Distort DNA Structure and Can Induce Increased DNA-binding by Transcription Factor Proteins</i>	
16:55 – 17:15	Alexander Wood, Newcastle University, United Kingdom* <i>What Gene Expression Noise Tells about the Spatiotemporal Organization of Gene Regulatory Networks</i>	
17:15 – 18:00	illumina Workshop	
18:00 – 20:00	Dinner .....	Sunset Restaurant

## Friday, August 24, 2018

8:30 – 12:00	Registration/Information .....	Santa Cruz Room
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### Session IX

#### Extreme Genomes

Massa Shoura, Stanford University, USA, Chair

9:00 – 9:45	Ami Bhatt, Stanford University, USA <i>Culture-free Microbial Genome Assembly and Tracking in Hospitalized Patients</i>	
9:45 – 10:05	Jason DeRouchey, University of Kentucky, USA* <i>DNA in Tight Spaces: Linking Structure, Stability, and Protection in Sperm Chromatin</i>	
10:05 – 10:50	Joanna Kelley, Washington State University, USA <i>Eukaryotic Genome Evolution in Extreme Environments</i>	
10:50 – 11:20	Closing Remarks Co-Organizers: Sarah Harris, Stephen Levene, Massa Shoura	
12:00 – 14:00	Lunch .....	Sunset Restaurant

# We never stop seeking

We are driven to know more—to relentlessly search for the answers that will advance the understanding of genomics to improve human health. And we realize we can't do it alone. We're counting on the next generation of scientific minds to help us keep up the momentum. As the leading developer of genomic solutions and services, we help accelerate genetic research and its use in the fields of cancer, hereditary disease, reproductive health, infectious disease, and agriculture. Together, we'll realize the promise of personalized medicine.

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