

DNA22 PROGRAM

Sunday, September 4, 2016		
Start Time	Activity	
12:00 Noon	Registration / Check-in open until 6pm	
Tutorials - open for all participants		
2:30 PM	Tutorial 1 - Nadrian Seeman. Controlling Structure and Motion in Multiple Dimensions with DNA Information	
3:30 PM	Break	
3:45 PM	Tutorial 2 - Paul W.K. Rothemund. On the Use of DNA Origami to Align Molecular Devices	
4:45 PM	Break	
5:00 PM	Tutorial 3 - Thomas Ouldridge. The Importance of Thermodynamics for Molecular Systems, and the Importance of Molecular Systems for Thermodynamics	
6:00 PM	Walk to Beergarden for Mentoring Talks	
Monday, September 5, 2016		
Start Time	Activity	Chair
8:00 AM	Registration / Check-in open until 6pm	
9:00 AM	Opening Remarks	
9:15 AM	Plenary Talk 1 - Matthew Cook. Computing Without Random Access Memory: Cyclic Tag Systems for Proofs and Interpretation	Erik Winfree
10:15 AM	Break	
Chemical Reaction Networks 1		
10:45 AM	Robert Brijder, David Doty and David Soloveichik. Robustness of Expressivity in Chemical Reaction Networks	Erik Winfree
11:10 AM	Anu Thubagere, Chris Thachuk, Joseph Berleant, Robert Johnson, Diana Ardelean and Lulu Qian. Compiler-aided systematic construction of large-scale DNA strand displacement circuits using unpurified components	Erik Winfree
11:35 AM	Luca Cardelli, Marta Kwiatkowska and Max Whitby. Chemical Reaction Network Designs for Asynchronous Logic Circuits	Erik Winfree
12:00 Noon	Lunch	
1:45 PM	Robert F. Johnson, Qing Dong and Erik Winfree. Verifying Chemical Reaction Network Implementations: A Bisimulation Approach	Matthew Patitz
2:10 PM	Luca Cardelli, Marta Kwiatkowska and Luca Laurenti. Programming Discrete Distributions with Chemical Reaction Networks	Matthew Patitz
2:35 PM	Ibuki Kawamata, Shota Kawakami, Yu-chin Chen, Shogo Hiratsuka, Sho Aradachi, Daisuke Tamatsuki, Hayato Yuuki, Takuto Takahashi, Eiki Ishihara, Shunsuke Imai, Hayato Otaka, Yuto Otaki, Kenta Suzuki, Taiki Watanabe, Ken Komiya, Fumi Takabatake, Shin-ichiro M. Nomura and Satoshi Murata. Autonomous and Programmable Strand Generator Implemented as DNA Chemical Reaction Network	Matthew Patitz
3:00 PM	Break	
DNA Biophysics		
3:45 PM	Stefan Badelt, Christoph Flamm and Ivo L. Hofacker. Energy landscapes and folding kinetics of pairwise interacting RNAs	Aleksei Aksimentiev
4:10 PM	Cameron P. Gallivan, Cade B. Markegard, Darrell D. Cheng and Hung D. Nguyen. Elucidating DNA Hybridization Mechanisms in Structural and Dynamic DNA Nanotechnology via Molecular Dynamics Simulations	Aleksei Aksimentiev
4:35 PM	Group Photo	
5:30 PM	Reception - Chinesischer Turm	

Tuesday, September 6, 2016		
Start Time	Activity	Chair
8:00 AM	Registration / Check-in open until 9am	
9:00 AM	Plenary Talk 2 - Bernard Yurke. Can Excitonic Quantum Computers be Constructed by DNA Assembly of Chromophore Networks?	Ralf Jungmann
10:00 AM	Niranjn Srinivas, James Parkin, Georg Seelig, Erik Winfree and David Soloveichik. Enzyme-free nucleic acid dynamical systems	Ralf Jungmann
10:25 AM	Break	
Applications in Biochemistry & Biophysics		
10:55 AM	Jonas J. Funke, Philip Ketterer, Corinna Lieleg, Philipp Korber and Hendrik Dietz. Uncovering the forces between nucleosomes using DNA origami	Ralf Jungmann
11:20 AM	Toma E. Tomov, Roman Tsukanov, Yair Glick, Yaron Berger, Miran Liber, Dorit Avrahami, Doron Gerber and Eyal Nir. A User Interface for Communicating with Synthetic DNA Machines and DNA Computers	Ralf Jungmann
11:45 AM	Jessica S. Lorenz, Jörg Schnauß, Martin Glaser, Martin Sajfutdinow, Carsten Schuldt, Ines Neundorff, Joseph A. Käs and David M. Smith. Synthetic cross-linkers modulate mechanical properties and dynamics of actin structures	Ralf Jungmann
12:10 PM	Lunch on your own	
2:00 PM	Plenary Talk 3 - Rebecca Schulman. From One, Many: Programmably Reconfigurable, Multiscale Materials Built with DNA	Ebbe Andersen
3:00 PM	Vahid Mardanlou, Leopold N. Green, Hari K.K. Subramanian, Rizal F. Hariadi, Jongmin Kim and Elisa Franco. A Coarse-Grained Model of DNA Nanotube Population Growth	Ebbe Andersen
3:25 PM	Break	
Patterns & Materials		
4:10 PM	Anton S. Zadorin, Guillaume Ginés, Jean-Christophe Galas and André Estevez-Torres. Synthesis of a reaction-diffusion French Flag pattern	Ebbe Andersen
4:35 PM	Matthias Morasch, Dieter Braun and Christof B. Mast. Heat flow driven oligonucleotide gelation separates single base differences	Ebbe Andersen
5:00 PM	Poster Session with Fingerfood	
7:30 PM	City Tour @ Odeonsplatz	

Wednesday, September 7, 2016		
Start Time	Activity	Chair
8:00 AM	Registration / Check-in open until 9am	
9:00 AM	Plenary Talk 4 - Pekka Orponen. Algorithms, Designs and Tools for 3D Wireframe DNA Origami	Andre Estevez-Torres
10:00 AM	Florian Praetorius and Hendrik Dietz. Genetically encoded DNA-protein hybrid origami	Andre Estevez-Torres
10:25 AM	Break	
Self-Assembly		
10:55 AM	Matthew J. Patitz, Trent A. Rogers, Robert T. Schweller, Scott M. Summers and Andrew Winslow. Resiliency to Multiple Nucleation in Temperature-1 Self-Assembly	Andre Estevez-Torres
11:20 AM	Jaimie Marie Stewart, Hari K. Subramanian and Elisa Franco. Self-assembly of multi-stranded RNA motifs into lattices and tubular structures	Andre Estevez-Torres
11:45 AM	Yo-Sub Han, Hwee Kim, Makoto Ota and Shinnosuke Seki. Nondeterministic Seedless Oritatami Systems and Hardness of Testing Their Equivalence	Andre Estevez-Torres
12:10 PM	Lunch on your own	
	Free Time	
5:00 PM	Plenary Talk 5 - Yan Liu. DNA Nanotechnology: From Structural Design to Functionality	Hendrik Dietz
6:00 PM	Simona Ranallo, Kevin W. Plaxco, Alexis Vallée-Bélisle and Francesco Ricci. Antibody-powered DNA-based nanodevices for diagnostic and drug-delivery applications	Hendrik Dietz
6:25 PM	Break	
Applications in Sensing and Actuation		
7:00 PM	Guido Grossi, Jørgen Kjems and Ebbe Sloth Andersen. A DNA origami vault to control single enzyme activity	Hendrik Dietz
7:25 PM	Jonathan R. Burns, Astrid Seifert, Niels Fertig and Stefan Howorka. Membrane-Spanning DNA Nanopores: Biomimetic Structures that Act as Molecular Valves	Hendrik Dietz
7:50 PM	Chen-Yu Li, Jejoong Yoo, Kerstin Gopfrich, Iwona Mames, Satya Prathyusha Bhamidimarri, Maria Ricci, Adam Mames, Alexander Ohmann, Mathias Winterhalter, Eugen Stulz, Ulrich F. Keyser and Aleksei Aksimentiev. Making sense of DNA membrane channels	Hendrik Dietz
8:15 PM	Poster Session with Fingerfood	

Thursday, September 8, 2016		
Start Time	Activity	Chair
8:00 AM	Registration / Check-in open until 9am	
9:00 AM	Plenary Talk 6 - Monika Heiner. From Petri Nets to Partial Differential Equations: a Petri Net Perspective on Systems and Synthetic Biology	Pekka Orponen
10:00 AM	Kevin M. Cherry and Lulu Qian. Scaling up molecular pattern recognition with DNA-based winner-take-all neural networks	Pekka Orponen
10:25 AM	Break	
Chemical Reaction Networks 2		
10:55 AM	Randolph Lopez and Georg Seelig. A Molecular Classifier for Gene Expression Diagnostics	Pekka Orponen
11:20 AM	Nicholas Schiefer and Erik Winfree. Time Complexity of Computation and Construction in the Chemical Reaction Network-Controlled Tile Assembly Model	Pekka Orponen
11:45 AM	Jacob Hendricks, Meagan Olsen, Matthew J. Patitz, Trent A. Rogers and Hadley Thomas. Hierarchical Self-Assembly of Fractals with Signal-Passing Tiles	Pekka Orponen
12:10 PM	Lunch	
Theory of molecular Computation		
1:45 PM	Zahra Derakhshandeh, Robert Gmyr, Alexandra Porter, Andréa W. Richa, Christian Scheideler and Thim Strothmann. On the Runtime of Universal Coating for Programmable Matter	Friedrich C. Simmel
2:10 PM	Manoj Gopalkrishnan. A Scheme for Molecular Computation of Maximum Likelihood Estimators for Log-Linear Models	Friedrich C. Simmel
3:00 PM	Tour to Wendelstein	
	Banquet / RNA Welcome Dinner @ Wendelstein	

Friday, September 9, 2016 - RNA Day		
Start Time	Activity	Chair
8:00 AM	Registration / Check-in open until 9am	
9:00 AM	Opening Remarks	
9:10 AM	Ebbe Andersen, Aarhus University. Cotranscriptional Folding of RNA Nanostructures	Kurt Gothelf
10:00 AM	Kirill Afonin, University of North Carolina/Charlotte. Functionally-interdependent RNA and DNA nanoparticles	Kurt Gothelf
10:50 AM	Break	
11:20 AM	Beatrix Süß, TU Darmstadt. RNA aptamers as genetic control devices - the potential of riboswitches as synthetic elements for regulating gene expression	Kirill Afonin
12:10 PM	Kai Papenfort, LMU München. Bacterial small RNAs: From strings of nucleotides to RNA networks	Kirill Afonin
13:00 PM	Lunch	
2:30 PM	Andrew Ellington, University of Texas/Austin. Proteins that integrate the RNA world with the DNA world	Friedrich C. Simmel
3:20 PM	Jongmin Kim, Harvard University: Ribocomputing devices for sophisticated in vivo logic computation	Friedrich C. Simmel
4:10 PM	UNACS student presentations	
4:40 PM	Conclusion	