

# Workshop: Automated Design, Fabrication, and Characterization of DNA-based Nanomaterials

January 17-18, 2023, Center for Functional Nanomaterials (CFN)  
Brookhaven National Laboratory

## Day 1 – Tuesday, January 17<sup>th</sup>

\*Coffee: 9 am - 9:20 am

**Welcome and Introduction: 9:20 am – 9:30 am**

### First topic group – DNA nanostructures

Talk 1: 9:30 am - 9:45 am

**Carlos Castro (Ohio State):** “Design and characterization of nanorobotic devices and assemblies”

Talk 2: 9:45 am – 10:00 am

**Konlin Shen (USCF):** “pScaf2: a helper strain for custom scaffold generation”

Talk 3: 10:00 am – 10:15 am

**Thorsten Schmidt (Kent Univ.):** “OLEA: Oligonucleotide Library Enrichment and Amplification”

\*Coffee break: 10:15 am – 10:30 am

Talk 4: 10:30 am – 10:45 am

**Chenxiang Lin (Yale):** “Building biomimetic structures with DNA nanotechnology”

Talk 5: 10:45 am – 11:00 am

**Fei Zhang (Rutgers):** “Challenges and Opportunities for Design, Assembly and Functionalization of DNA nanostructures”

Talk 6: 11:00 am – 11:15 am

**Ashwin Gopinath (MIT):** “Inorganic DNA origami: Modular tool for solution phase single molecule manipulation”

Talk 7: 11:15 am – 11:30 am

**William Shih (Harvard):** “Multi-micron crisscross structures grown from DNA-origami slats”

Talk 8: 11:30 am - 11:45 am

**Rebecca Taylor (CMU):** “Adventures in cloud laboratory-based production of DNA origami”

**Group discussion: 11:45 am – 12:15 pm**

\*Lunch: 12:15 pm – 1:00 pm

**CFN Tour: 1:00 pm – 1:30 pm**

### Second topic group: Assembly of DNA-based materials

**Introduction to session: 1:40 pm**

Talk 1: 1:45 pm – 2:00 pm

**Yonggang Ke (Emory):** “Scaling up DNA Brick (short DNA) Self-Assembly”

Talk 2: 2:00 pm – 2:15 pm

**Tim Liedl (LMU Munich):** TBD

Talk 3: 2:15 pm – 2:30 pm

**Oleg Gang (Columbia/BNL):** “3D Assembly of Nanoscale Materials”

Talk 4 2:30 pm – 2:45 pm

**Jason Kahn (BNL):** “Moving DNA nanotechnology to the macroscale: practical considerations in automated experimentation”

Talk 5: 2:45 pm – 3:00 pm

**Alexei Tkachenko (BNL):** “Design principles for multi-chromatic self-assembly”

**\*Coffee Break:** 3:00 pm – 3:15 pm

Talk 6: 3:15 pm – 3:30 pm

**Petr Sulc (ASU):** “Design tools and multiscale simulations for modeling DNA nanotechnology”

Talk 7: 3:30 pm – 3:45 pm

**David Pine (NYU):** “Directed self-assembly using DNA-coated colloids”

Talk 8: 3:45 pm – 4:00 pm

**Rebecca Schulman (JHU):** “DNA circuits for self-assembling and reconfiguring nanomaterials”

Talk 9: 4:00 pm – 4:15 pm

**Ben Rogers (Brandeis):** “Programming dynamic pathways to self-limited assembly”

**Break:** 4:15 pm – 4:30 pm

**Discussion** 4:30 pm – 5:15 pm

**Day 2 – Wednesday, January 18<sup>th</sup>**

**Third topic group – Integrating methods for generating complex DNA-based materials**

**\*Coffee and Introduction:** 9:00 am - 9:15 am

Talk 1: 9:15 am – 9:30 am

**Alex Liddle (NIST):** “Design, metrology, and machine learning: challenges and opportunities to advance nucleic acid nanostructure fabrication”

Talk 2: 9:30 am – 9:45 am

**Yugang Zhang (BNL):** “Revealing synthesized and assembled nanoscale architectures with x-ray scattering”

Talk 3: 9:45 am – 10:00 am

**Fang Lu (BNL):** “Shape-controllable synthesis, Surface modification, and Self-assembly”

Talk 4: 10:00 am – 10:15 am

**Durham Smith (Berkeley):** "DNA+X: Streamlining the Design, Simulation, Synthesis and Characterization of Complex Multimaterial Nanostructures"

**\*Coffee break:** 10:15 am – 10:30 am

Talk 5: 10:30 am – 10:45 am

**Aaron Michelson (BNL):** “3D Nanoscale imaging of DNA-based materials”

Talk 6: 10:45 am – 11:00 am

**Hao Yan (ASU):** “Designer Nucleic Acid Nanostructures for Programmable Self-assembly”

**Final group discussion:** 11:00 am – 11:45pm

**Concluding remarks:** 11:45 am – 12:00 pm

\* All foods is being paid out of pocket by each participant