

NCCAT SINGLE-PARTICLE ANALYSIS SHORT COURSE

MARCH 2-6, 2020 NEW YORK, USA

DAY 1: MONDAY, MARCH 2, 2020

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| 09:00 – 09:30 | Registration and Welcome – SEMC conference room |
| 09:50 – 10:00 | Opening – NYSBC conference room |
| 10:00 – 11:15 | Keynote / Lecture 1 – NYSBC conference room <i>Intro and overview of SPA</i> Joachim Frank (Columbia University) |
| 11:15 – 11:30 | Break |
| 11:30 – 12:00 | Roundtable 1 – SEMC conference room <i>Introductions and course overview</i> Short course attendees |
| 12:00 – 13:30 | Lunch |
| 13:30 – 14:15 | Lecture 2 – SEMC conference room <i>cryoVR sample preparation</i> Brenda Gonzalez & Jiahui Dong (Purdue University) |
| 14:15 – 14:30 | Break |
| 14:30 – 17:00 | Practical 1 – SEMC conference room <i>Support films and grids</i> Practical 2 – SEMC conference room <i>Plunge freezers and Chameleon</i> SEMC Staff |

DAY 2: TUESDAY, MARCH 3, 2020

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| 09:00 – 09:30 | Registration/Information desk – SEMC conference room |
| 09:45 – 10:45 | Lecture 3 – NYSBC conference room <i>Microscopes and tools of the trade</i> SEMC Staff |
| 10:45 – 11:00 | Break |
| 11:00 – 12:00 | Roundtable 2 – SEMC conference room <i>cryoEM Facility building</i> SEMC Staff |

12:00 – 13:30

Lunch

13:30 – 17:00

Practical 3 – SEMC conference room

TEM microscopes

SEMC Staff

DAY 3: WEDNESDAY, MARCH 4, 2020

09:00 – 09:30

Registration/Information desk – SEMC conference room

09:45 – 10:35

Lecture 4 – NYSBC conference room

Algorithms and foundational math PartI:

derivation/explanation of the CTF, FTs.

10:35 – 11:30

Algorithms and foundational math PartII:

reconstruction, classification, maximum likelihood.

Fred Sigworth (Yale University)

11:30 – 11:45

Break

11:45 – 12:30

Lecture 5 – NYSBC conference room

Data Analysis and reconstruction workflow

Amedee des Georges (ASRC/CUNY)

12:30 – 13:30

Lunch & Roundtable 3 – NYSBC conference room

Current algorithms to deal with SPA reconstruction

Fred Sigworth, Amedee des Georges & others

13:30 – 13:40

Group photo

13:40 – 17:00

Practical 4 – SEMC conference room

CryoEM on Demand (processing in the cloud using AWS)

Practical 3B – Krios control room

TEM microscopes (continued) - Krios operations

SEMC Staff

DAY 4: THURSDAY, MARCH 5, 2020

09:00 – 09:30

Registration/Information desk – SEMC conference room

09:45 – 10:45

Lecture 6 – NYSBC conference room

Interpretation and Limitations of SPA

Rich Hite (Memorial Sloan Kettering Cancer Center)

10:45 – 11:45

Lecture 7 – NYSBC conference room

Validation Methods

Tom Walz (Rockefeller University)

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| 11:45 – 12:15 | Roundtable 4 – NYSBC conference room <i>EM challenges and new frontiers</i> Rich Hite, Tom Walz & others |
| 12:15 – 13:30 | Lunch |
| 13:30 – 15:45 | Practical 4B – SEMC conference room <i>CryoEM on Demand (wrap-up)</i> mini-roundtable: Results, resolution and EM maps SEMC Staff |
| 13:30 – 15:45 <i>by appointment</i> | Practical 3C – Krios control room <i>TEM microscopes (continued) - Krios operations</i> <i>Time reserved for data collection of select student projects</i> |
| 15:45 – 17:00 | Lecture 8 – SEMC conference room <i>EMDataResource: Structure Data Archiving, Validation Challenges</i> Cathy Lawson (Rutgers University) |
| 18:00 – 20:00 | Reception <i>Group dinner</i> |

DAY 5: FRIDAY, MARCH 6, 2020

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| 09:00 – 17:00 | Registration/Information desk – SEMC conference room <i>room available all day except for practicals</i> |
| 09:45 – 10:45 | Lecture 9 – NYSBC conference room <i>Fitting Atomic Models</i> Oli Clarke (Columbia University) |
| 10:45 – 11:45 | Lecture 10 – NYSBC conference room <i>Coordinate Refinement and Validation</i> Gira Bhabha & Damien Ekiert (New York University) |
| 11:45 – 12:15 | Roundtable 4 – NYSBC conference room <i>Making biological conclusions from cryoEM reconstructions.</i> Gira Bhabha, Damien Ekiert, Oli Clarke & others |
| 12:15 – 12:30 | Lunch (pizza lunch) – SEMC conference room <i>working lunch through practical</i> |
| 12:30 – 15:45 | Practical 5 – SEMC conference room <i>Coot and model building</i> Oli Clarke & SEMC Staff |
| 13:45 – 15:45 <i>by appointment</i> | Practical 3D – Krios control room <i>TEM microscopes (continued) - Krios operations</i> |

Time reserved for data collection of select student projects
SEMC Staff

15:45 – 16:15

Closing and farewell