

# NCCAT SINGLE-PARTICLE ANALYSIS SHORT COURSE

## MARCH 2-6, 2020 NEW YORK, USA

### DAY 1: MONDAY, MARCH 2, 2020

09:00 – 09:30	<b>Registration and Welcome</b> – SEMC conference room
09:50 – 10:00	<b>Opening</b> – NYSBC conference room
10:00 – 11:15	<b>Keynote / Lecture 1</b> – NYSBC conference room <i>Intro and overview of SPA</i> Joachim Frank (Columbia University)
11:15 – 11:30	<b>Break</b>
11:30 – 12:00	<b>Roundtable 1</b> – SEMC conference room <i>Introductions and course overview</i> Short course attendees
12:00 – 13:30	<b>Lunch</b>
13:30 – 14:15	<b>Lecture 2</b> – SEMC conference room <i>cryoVR sample preparation</i> Brenda Gonzalez & Jiahui Dong (Purdue University)
14:15 – 14:30	<b>Break</b>
14:30 – 18:00	<b>Practical 1</b> – SEMC conference room <i>Support films and grids</i> <b>Practical 2</b> – SEMC conference room <i>Plunge freezers and Chameleon</i> SEMC Staff

### DAY 2: TUESDAY, MARCH 3, 2020

09:00 – 09:30	<b>Registration/Information desk</b> – SEMC conference room
09:45 – 10:45	<b>Lecture 3</b> – NYSBC conference room <i>Microscopes and tools of the trade</i> SEMC Staff
10:45 – 11:00	<b>Break</b>
11:00 – 12:00	<b>Roundtable 2</b> – 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 – 13:15

**Lunch & Roundtable 3** – NYSBC conference room

*Current algorithms to deal with SPA reconstruction*

Fred Sigworth, Amedee des Georges & others

13:15 – 13:30

**Group photo**

13:30 – 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)

11:45 – 12:15	<b>Roundtable 4</b> – NYSBC conference room <i>EM challenges and new frontiers</i> Rich Hite, Tom Walz & others
12:15 – 13:30	<b>Lunch</b>
13:30 – 15:45	<b>Practical 4B</b> – SEMC conference room <i>CryoEM on Demand (wrap-up)</i> <b>mini-roundtable: Results, resolution and EM maps</b> SEMC Staff
13:30 – 15:45 <i>by appointment</i>	<b>Practical 3C</b> – 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	<b>Lecture 8</b> – SEMC conference room <i>EMDataResource: Structure Data Archiving, Validation Challenges</i> Cathy Lawson (Rutgers University)
18:00 – 20:00	<b>Reception</b> <i>Group dinner</i>

## DAY 5: FRIDAY, MARCH 6, 2020

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