

## **Instruct Course: From 2D images to 3D structures: A practical course on Electron Microscopy Single Particle Analysis” Programme**

### **Tuesday, May 17**

09:00 - 09:15: Jose Maria Carazo: Introduction to the course  
09:15 - 10:00: Jose Maria Carazo: Introduction to 3D EM  
10:00 - 11:00: Carlos Oscar Sorzano: "Basic Background: Fourier transform, central section theorem, sampling"  
11:00 – 11:30: Coffee break  
11:30 - 12:00: Practical work. Jose Miguel de la Rosa: "Introduction to Single Particle workflow in Scipion".  
12:00 - 13:00: Josue Gomez: "DDD, Screening micrographs and CTF"  
13:00 – 14:00: Lunch  
14:00 - 15:00: Practical work. Josue Gomez: "particle picking and screening"  
15:00 - 16:00: Practical work. Jose Miguel de la Rosa: "2D classification"  
16:00 – 16:30: Coffee break  
16:30 - 17:30: Practical work. Javier Vargas: "Initial volume"  
17:30 - 18:30: Practical work. Roberto Melero: "Alignment, classification, and reconstruction - I"

### **Wednesday, May 18**

09:00 - 10:30: Practical work. Roberto Melero: "Alignment, classification, and reconstruction - II"  
10:30 – 11:00: Coffee break  
11:00 - 12:00: Practical work. Carlos Oscar Sorzano: "Validation and analysis"  
12:00 - 13:00: Presentation. Pablo Conesa: "Scipion Web Tools"  
13:00 – 14:00: Lunch  
14:00 - 15:00: Lecture: Ardan Patwardhan: "EMDB and PDB"  
15:00 - 16:00: Martyn Winn: "Overview of techniques for fitting and refining atomic models"  
16:00 – 16:30: Coffee break  
16:30 - 18:30: Agnel Praveen Joseph: "Scoring and assessment of model fitting"  
18:30 - 19:30: Practical work. Agnel Praveen Joseph: "Rigid body fitting and scoring of multi-component assemblies"

### **Thursday, May 19**

09:00 - 10:00: Tom Burnley: "Introduction to CCP-EM software "  
10:00 - 11:00: Martin Wynn: "Refinement of atomic models against EM density using Refmac"  
11:00 – 11:30: Coffee break  
11:30 - 13:00: Practical work. Agnel Praveen Joseph: "Flexible fitting with FlexEM"  
13:00 – 14:00: Lunch  
14:00 - 14:30: Tom Burnley: "High resolution: model building in Coot"  
14:30 - 16:00: [Practical] Martyn/Tom: "Model building in Coot"



CCP-EM



EMDataBank  
Unified Data Resource for 3DEM



instruct  
image  
Processing  
Center



16:00 – 16:30: Coffee break

16:30 - 18:00: Practical work. Tom Burnley: "Model refinement with Refmac"

18:00 - 18:30: Joan Segura: "Incorporating Bioinformatics Annotations: 3DBionotes"

### **Friday, May 20**

9:00 - 10:00: Ardan Patwardhan: "Volume matching with SMaSB / PDBeShape"

10:00 - 11:00: Practical work. Agnel Praveen Joseph: "Volume matching with PDBeShape"

11:00 – 11:30: Coffee break

11:30 – 13:00: Practical work. Students revise model fitting, building and refinement for their structures.

13:00 – 14:00: Lunch