



PhD course Electron Microscopy



Monday 14 October 2013

Lecture Theater 21.2.26

Time	Topic	Lecturer
09:00 – 09:30	Introduction	KQ
09:30 – 10:30	Principles of Electron Microscopy / TEM	RF
10:30 – 10:45	Coffee	
10:45 – 11:30	Electron sources/vacuum systems	RL
11:30 – 12:15	Biological Electron Microscopy I: Electron – specimen interactions	PCH
12:15 – 13:00	Lunch	
13:00 – 14:00	Biological Electron Microscopy II: Sample preparation TEM	PCH
14:00 – 14:45	Immuno labelling	PCH
14:45 – 15:00	Coffee	
15:00 – 16:00	Modern SEM techniques	NL
16:00 – 16:30	Biological Electron Microscopy II: Sample preparation SEM	PCH
16:30 – 17:00	Questions, assign groups	

Tuesday 15 October

Time	Topic	Room	Lecturer
09:00 – 09:45	Introduction to DualBeams, FIB and 3D applications	21.2.26	NL
09:45 – 10:00	Coffee (CFIM)		
10:00 – 11:15	<i>Practical</i> 1) Lab specimen preparation TEM and SEM sample preparation 2) Ultramicrotomy, knife breaking 3) Negative staining, CM100 4) SEM alignment, XL 30 / Quanta 3D 5) TEM alignment, CM 100	16.1.39 16.1.39 CFIM CFIM CFIM	PCH ZN RF/KQ NL RL
11:20 – 12:35	<i>Practical continued</i>		
12:35 – 12:50	Lunch		
12:50 – 14:05	<i>Practical continued</i>		
14:10 – 15:25	<i>Practical continued</i>		
15:25 – 15:40	Coffee		
15:45 – 17:00	<i>Practical continued</i>		

Wednesday 16 October

Time	Topic		Lecturer
09:00 – 09:45	Recording images – camera systems	21.2.26	RF/KA/NL
09:45 – 10:00	Coffee (CFIM)		
10:00 – 11:15	<i>Practical</i> 1) SEM - Quanta 3D 2) TEM - CM100 (a) 3) TEM – Tecnai G2 20 4) Ultramicrotomy <i>DIY</i> 5) TEM – CM100 (b)	16.1.39	NL ML RL PCH KQ
11:15 – 12:30	<i>Practical continued</i>		
12:30 – 13:15	Lunch		
13:15 – 14:30	<i>Practical continued</i>		
14:30 – 15:15	<i>Practical continued</i>		
15:15 – 15:30	Coffee		
15:30 – 16:45	<i>Practical continued</i>		

Thursday 17 October

Time	Topic		Lecturer
09:00 – 10:00	Cryo TEM and SEM	21.2.26	RF
10:00 – 10:10	Coffee		
10:15 – 11:00	HPF and Freeze sub		SM
CFIM			
11:00 – 12:15	<i>Practical</i> 1) Cryo-TEM (Tecnai) 2) Cryo-SEM (Quanta) 3) Cryo ultramicrotomy 4) Freeze substitution 5) HPF	16.1.39 16.1.39	RL/ML RF/NL KT PCH/ZN SM
12:15 – 13:00	Lunch		
13:00 – 14:15	<i>Practical continued</i>		
14:15 – 15:30	<i>Practical continued</i>		
15:30 – 15:45	Coffee		
15:45 – 17:00	<i>Practical continued</i>		

Faculty Club

17:00	Course dinner		
	<i>Evening Lecture</i>		
	Pippa Hawes: Imaging at High Containment		

Friday 18 October

Time	Topic		Lecturer
09:00 – 09:45	Imaging in 3D – electron tomography	21.2.26	PCH
09:45 – 10:30	Data handling and image analysis	21.2.26	KA
10:30 – 10:45	Coffee		
10:45 – 11:30	Data handling and image analysis continued	21.2.26	KA
CFIM			
11:30 – 12:30	<i>Practical</i> 1) Quanta 3D - FIB SEM slice'n'view 2) Tecnai G2 20 - Tomography 3) Image analysis software		KQ/ML RL/RF KA
12:30 – 13:15	Lunch		
13:15 – 14:15	<i>Practical continued</i>		
14:15 – 15:15	<i>Practical continued</i>		
15:15 – 15:30	Coffee		
15:30 – 16:15	Quiz (prizes available!)		
16.15 – 17.00	Questions, evaluation		