

Cryo-FIB preparation of lamella

Sample preparation course

Diamond 15/11/2019

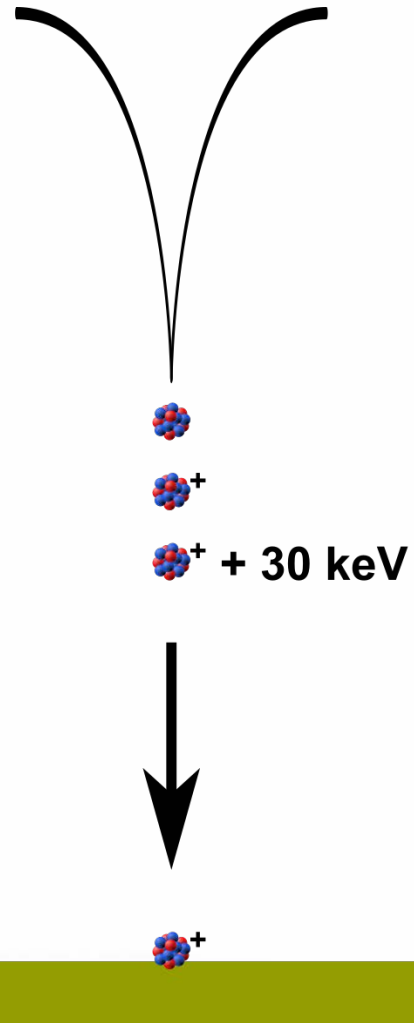
James Gilchrist (eBIC)



Introduction

- Ion beams and dual-beams
- On grid lamella preparation
- CryoFIB at Diamond

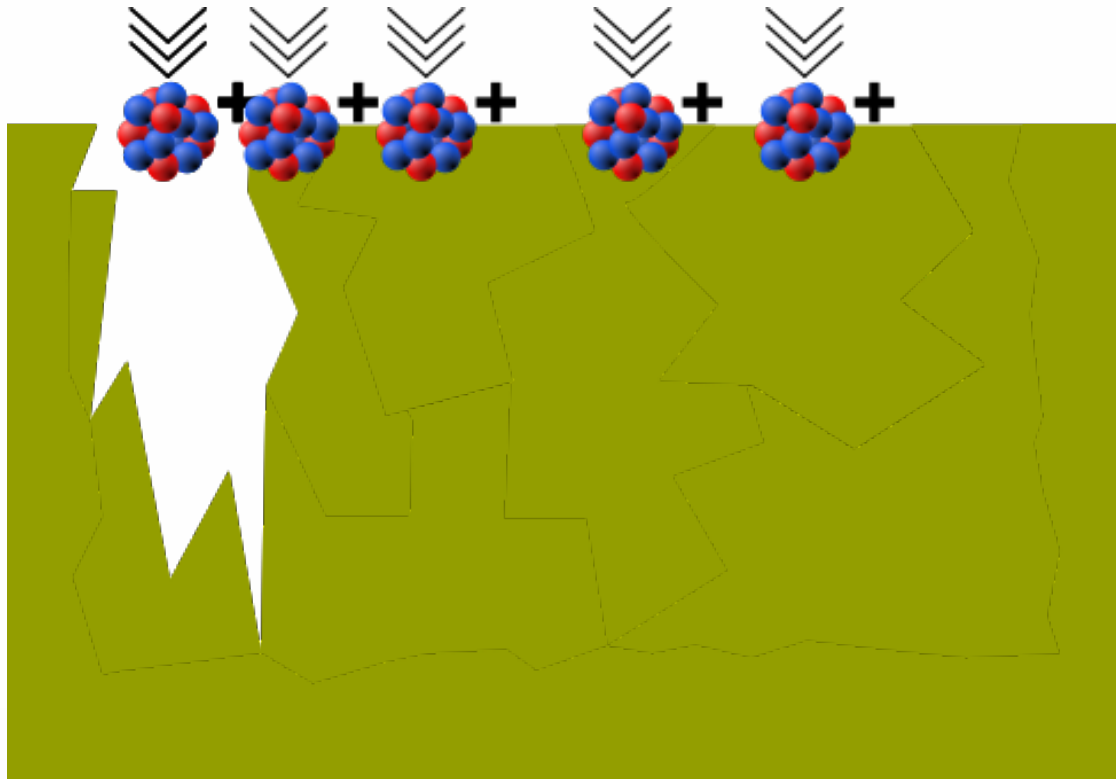
Ion beams



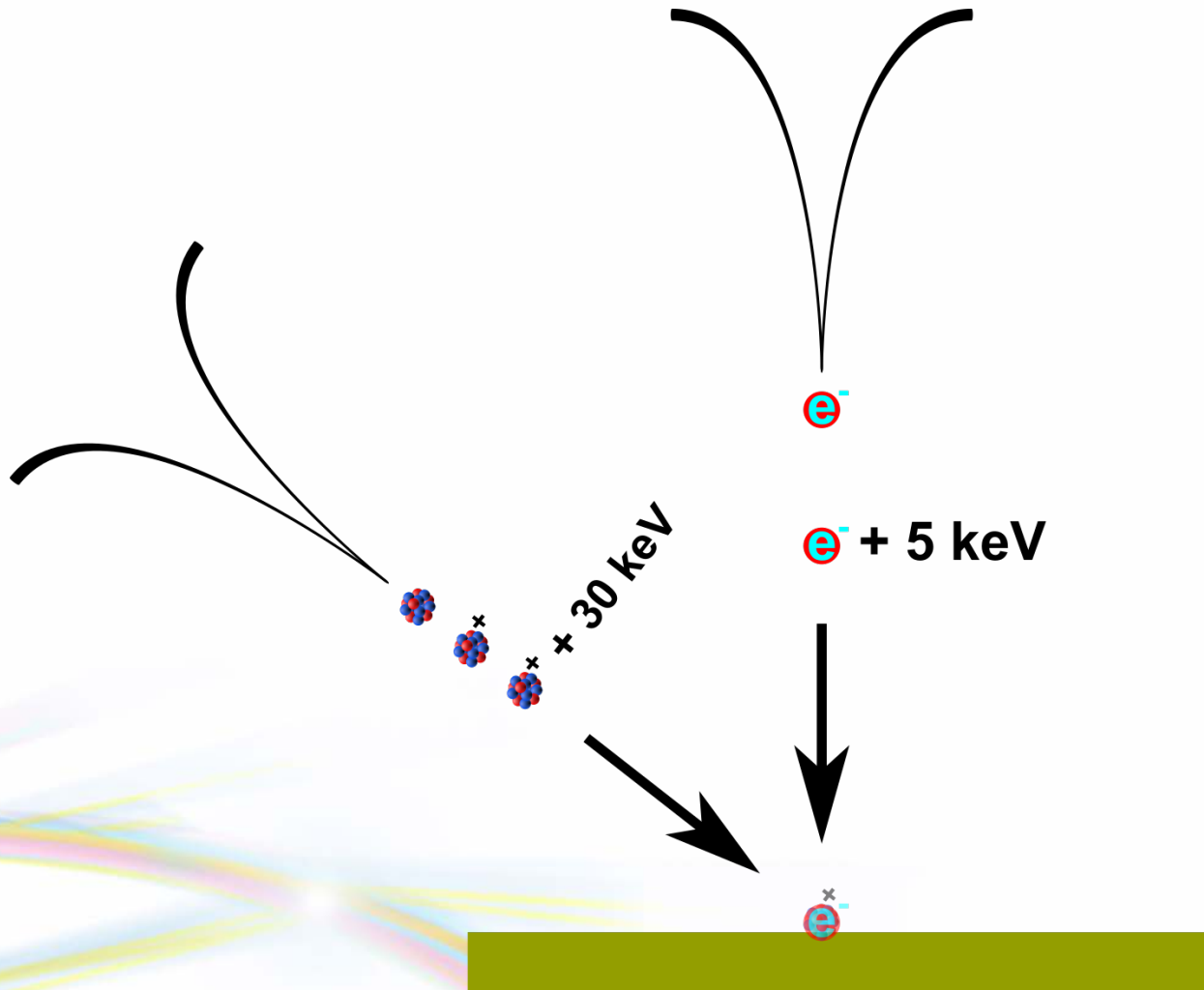
Ion beams



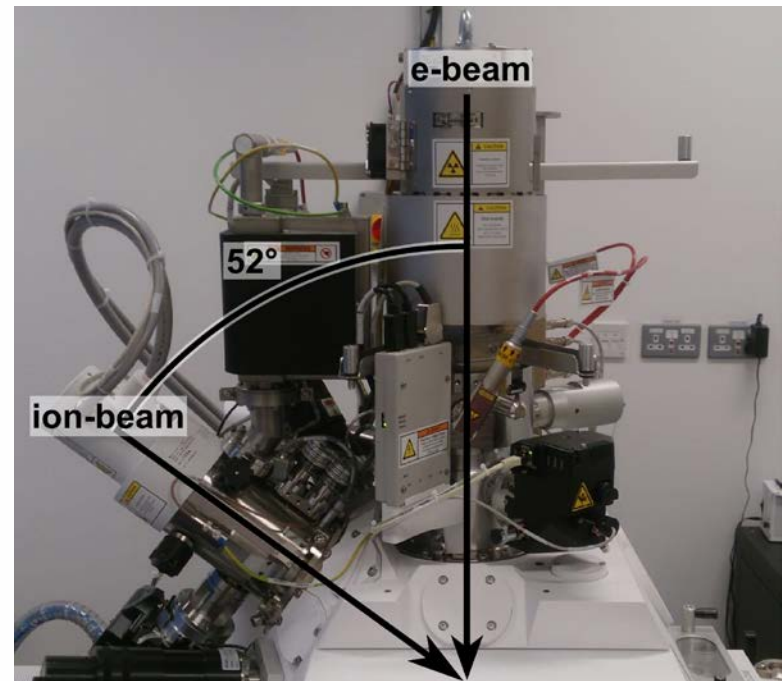
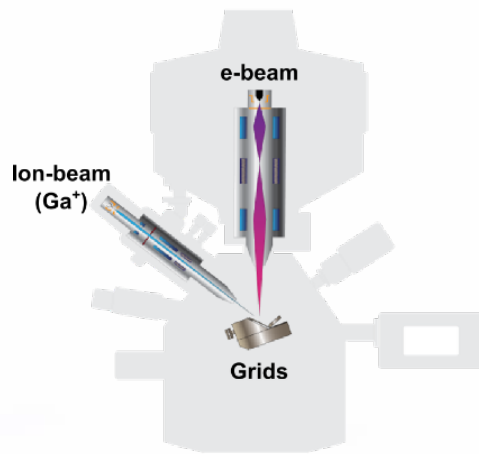
Ion beams



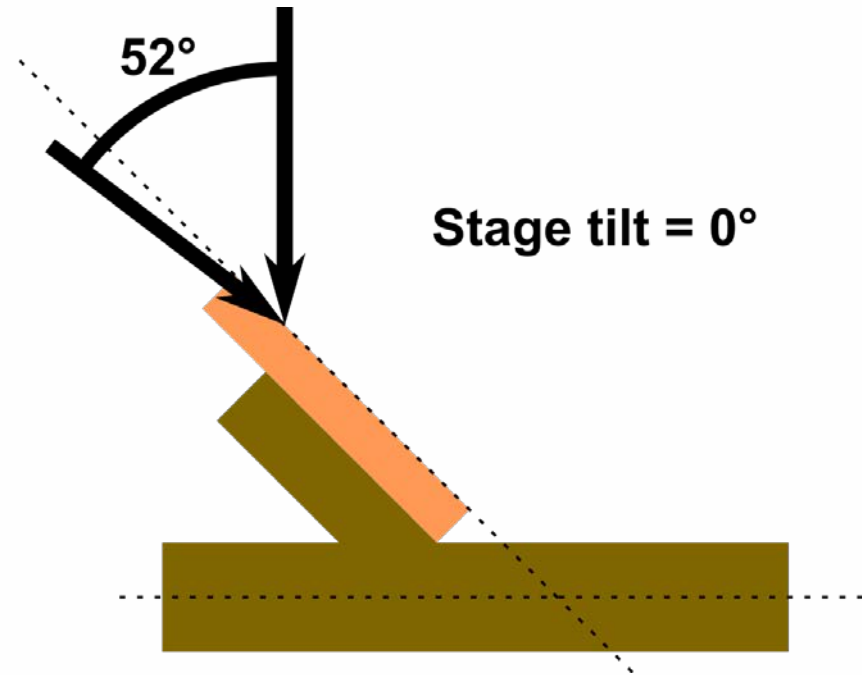
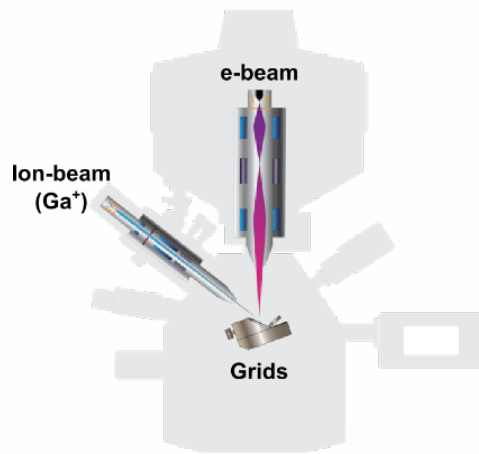
Dual-beam instruments



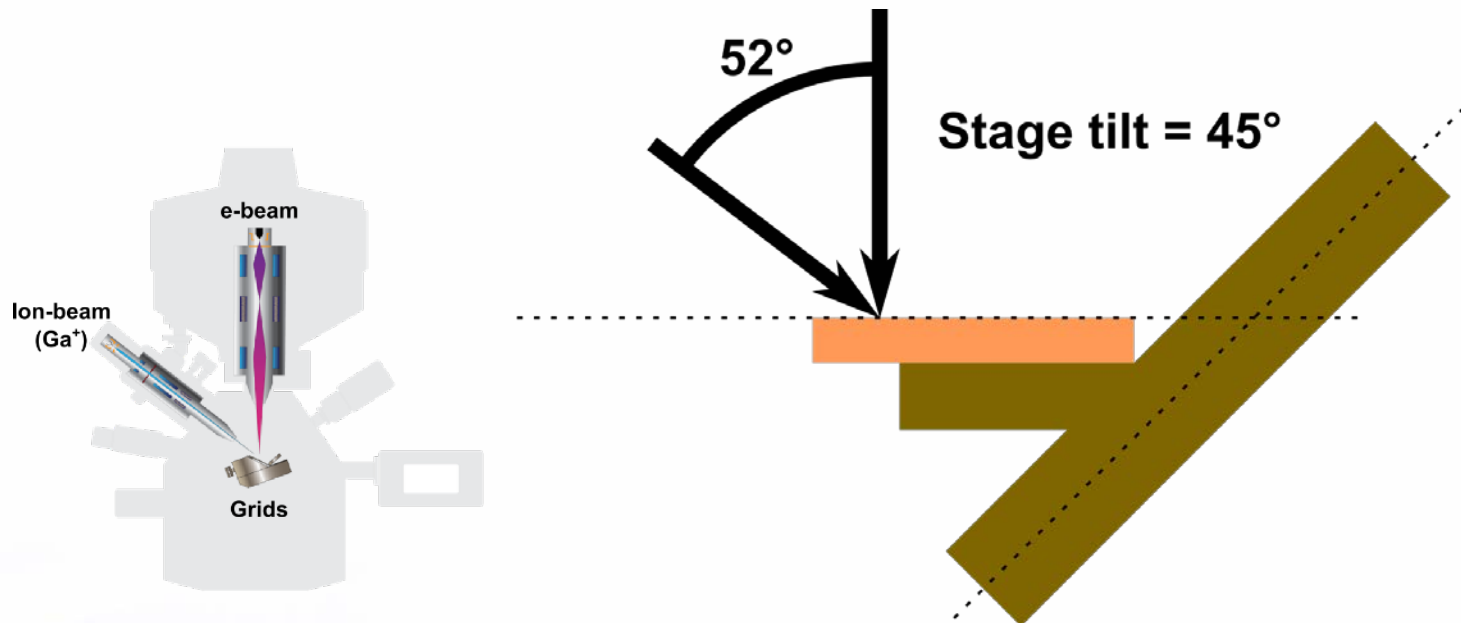
Dual-beam instruments



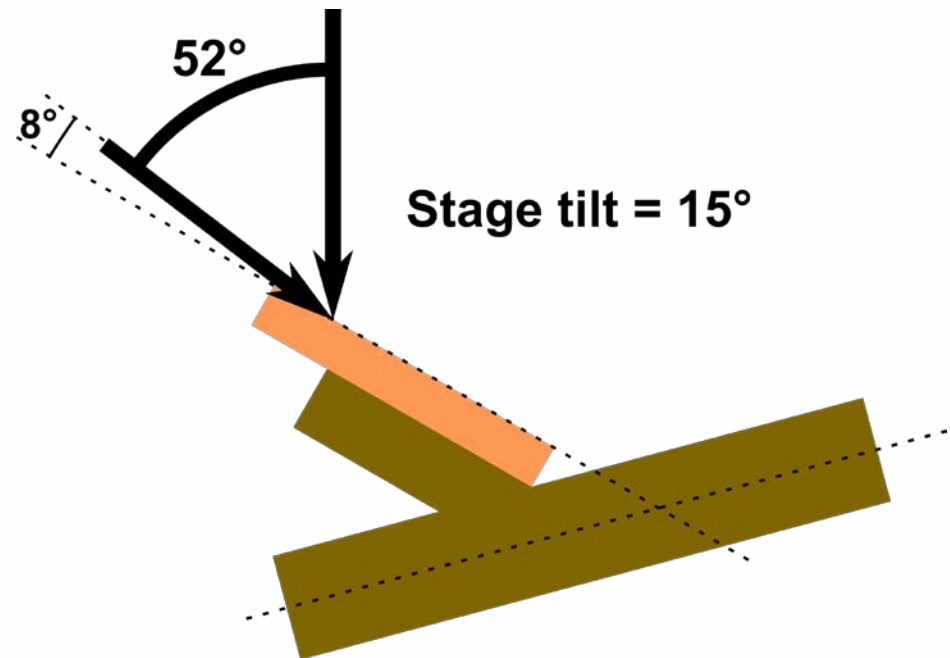
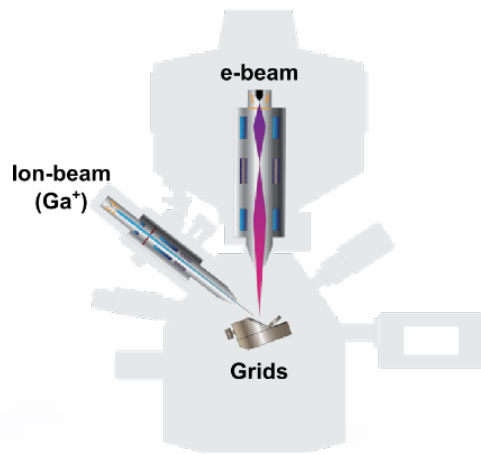
Dual-beam instruments



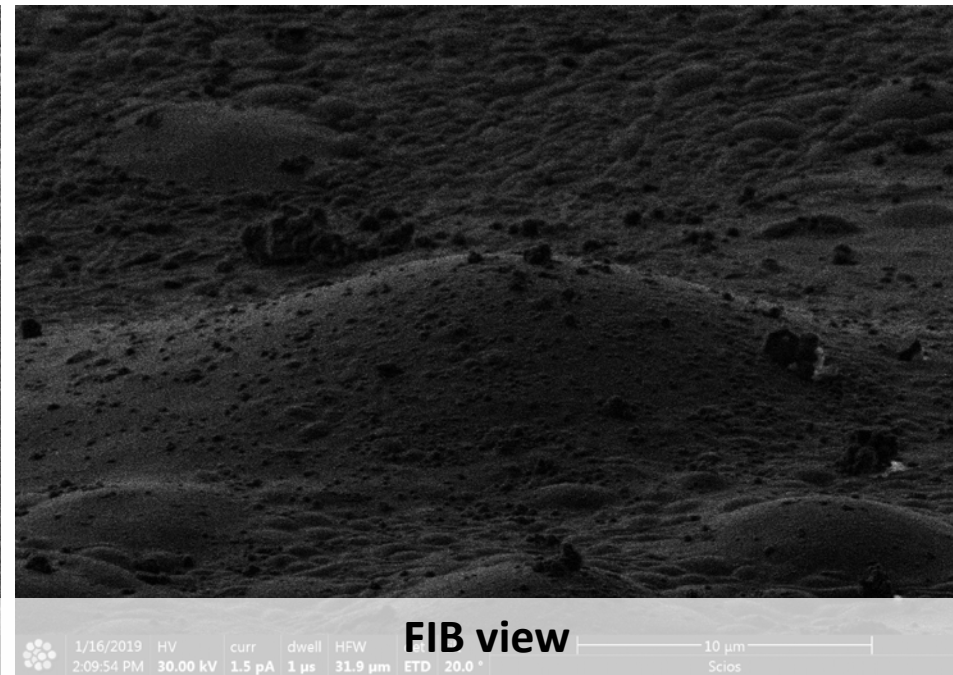
Dual-beam instruments



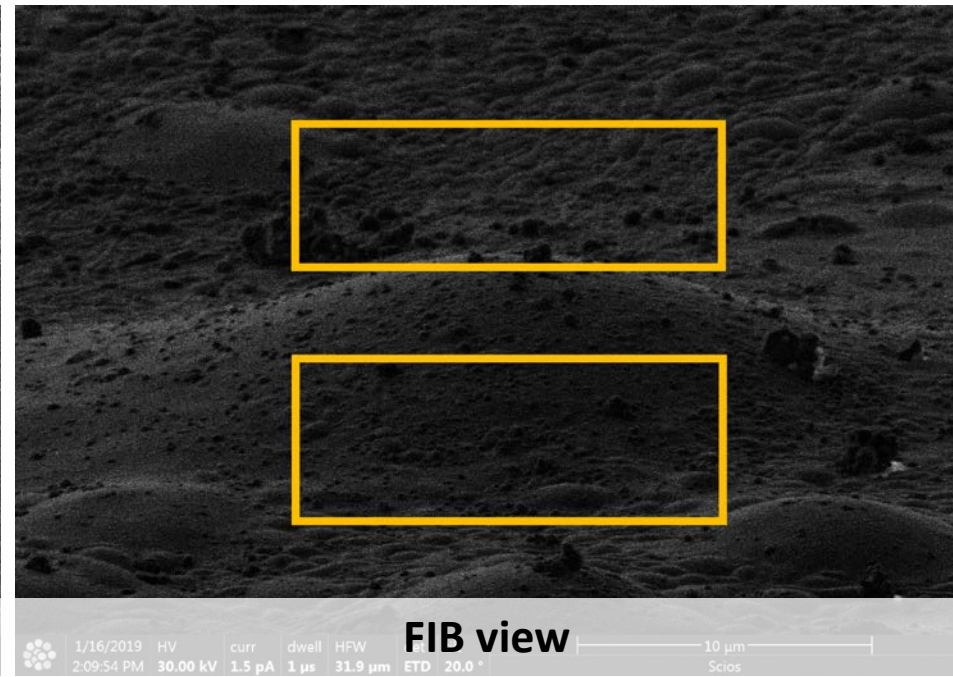
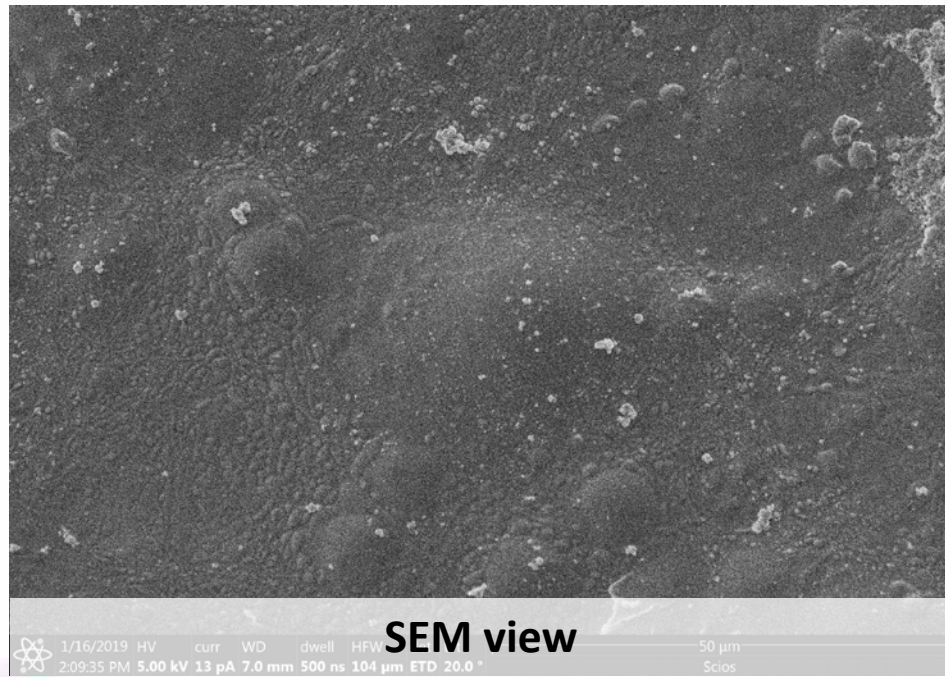
Dual-beam instruments



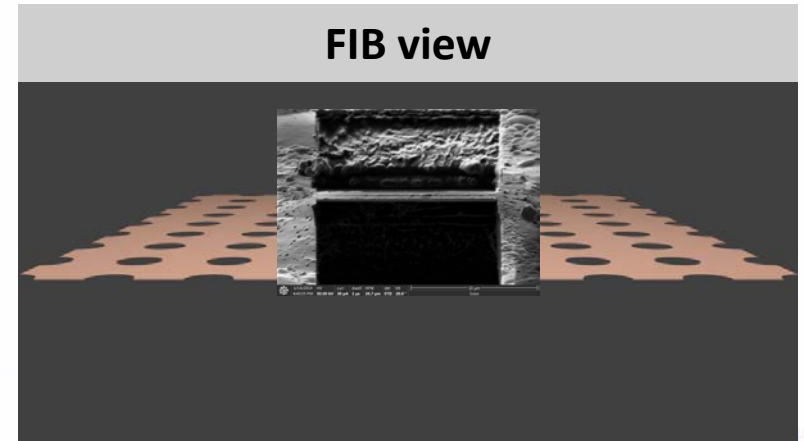
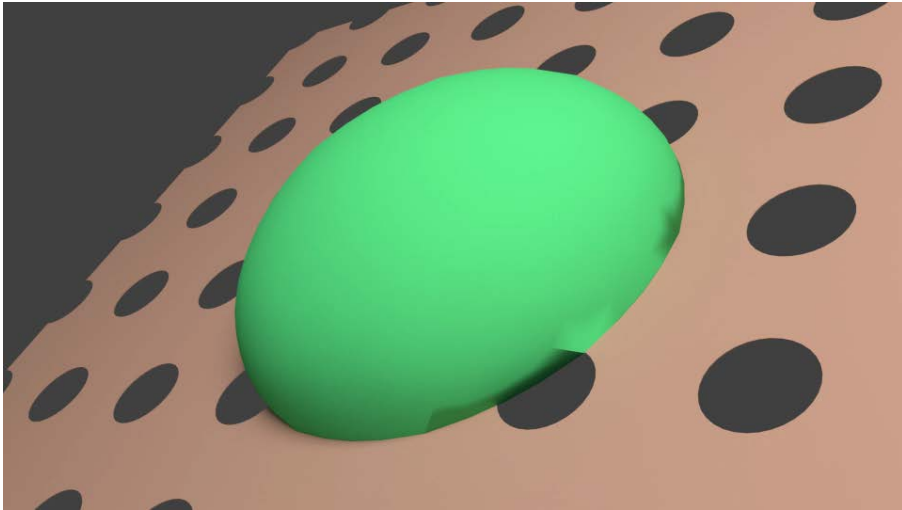
Dual-beam instruments



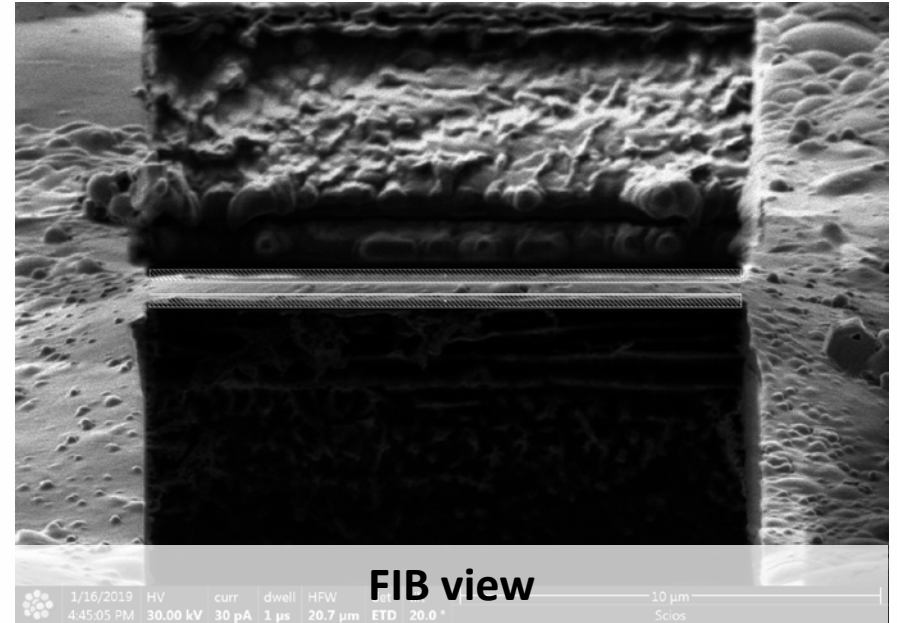
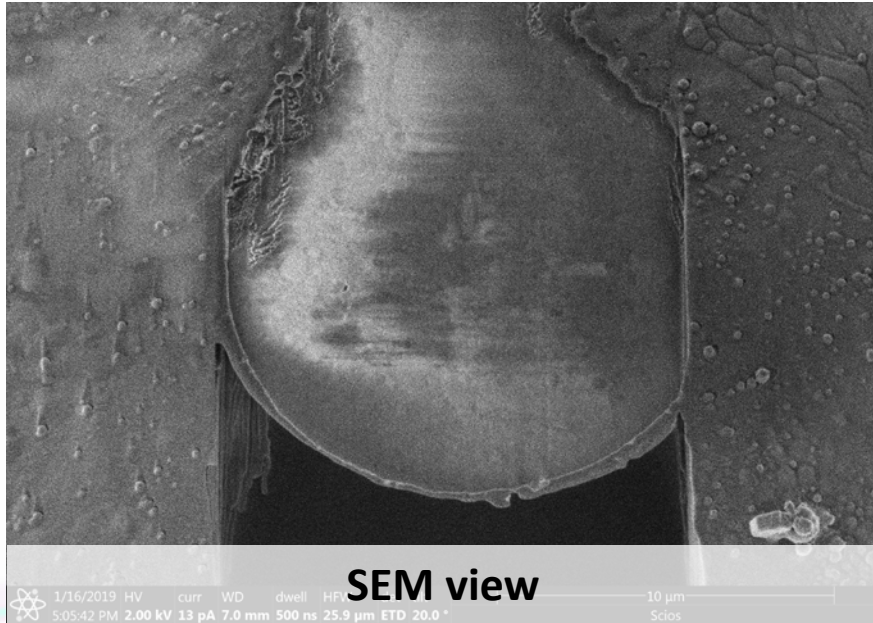
Dual-beam instruments



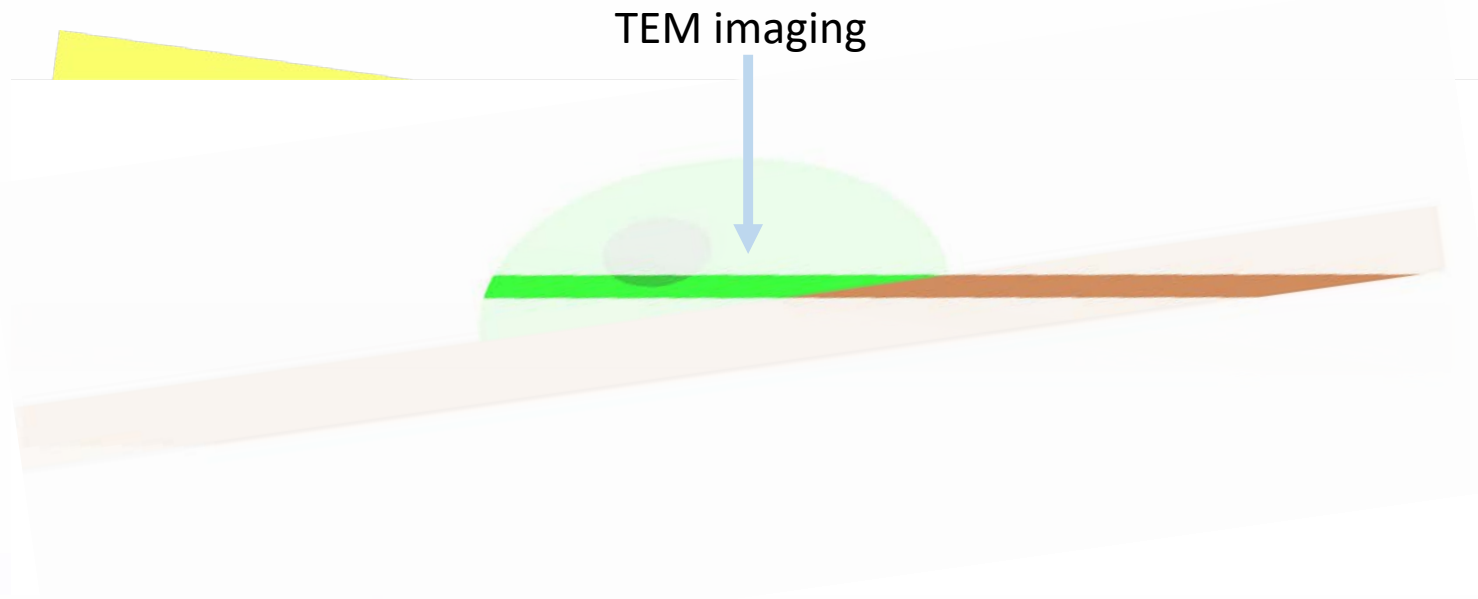
On grid lamella preparation



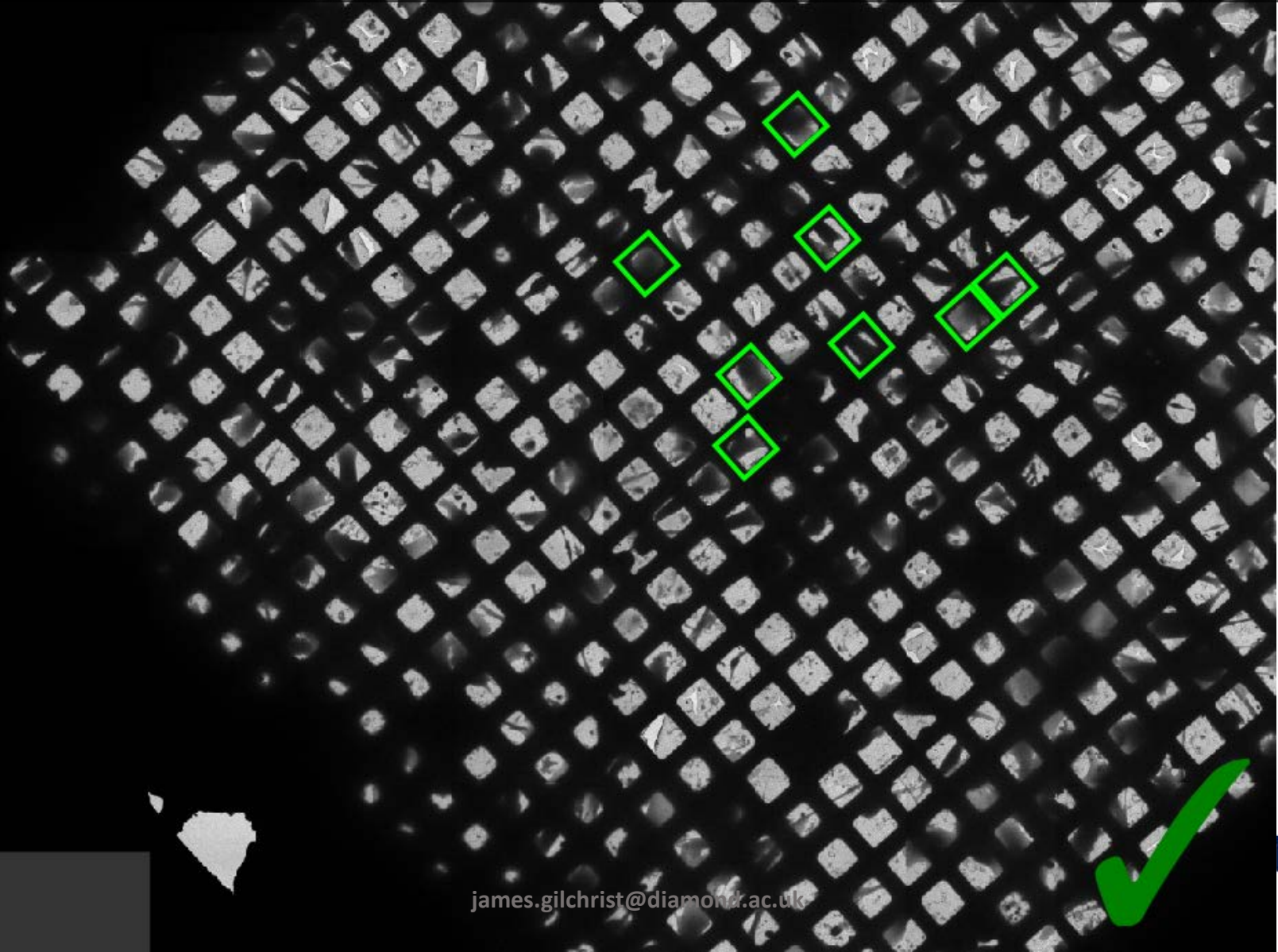
On grid lamella preparation



On grid lamella preparation



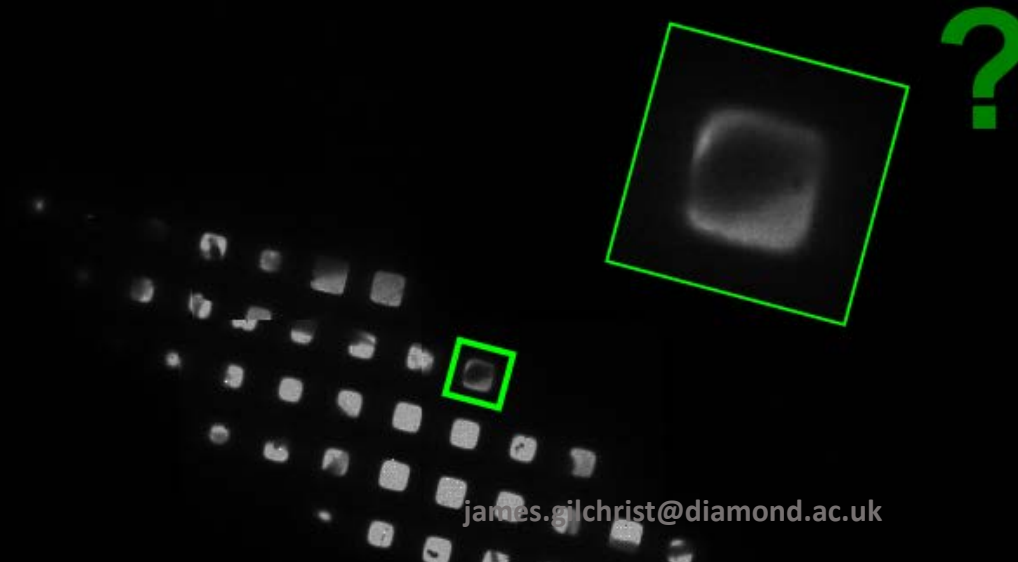
Identifying targets - screening



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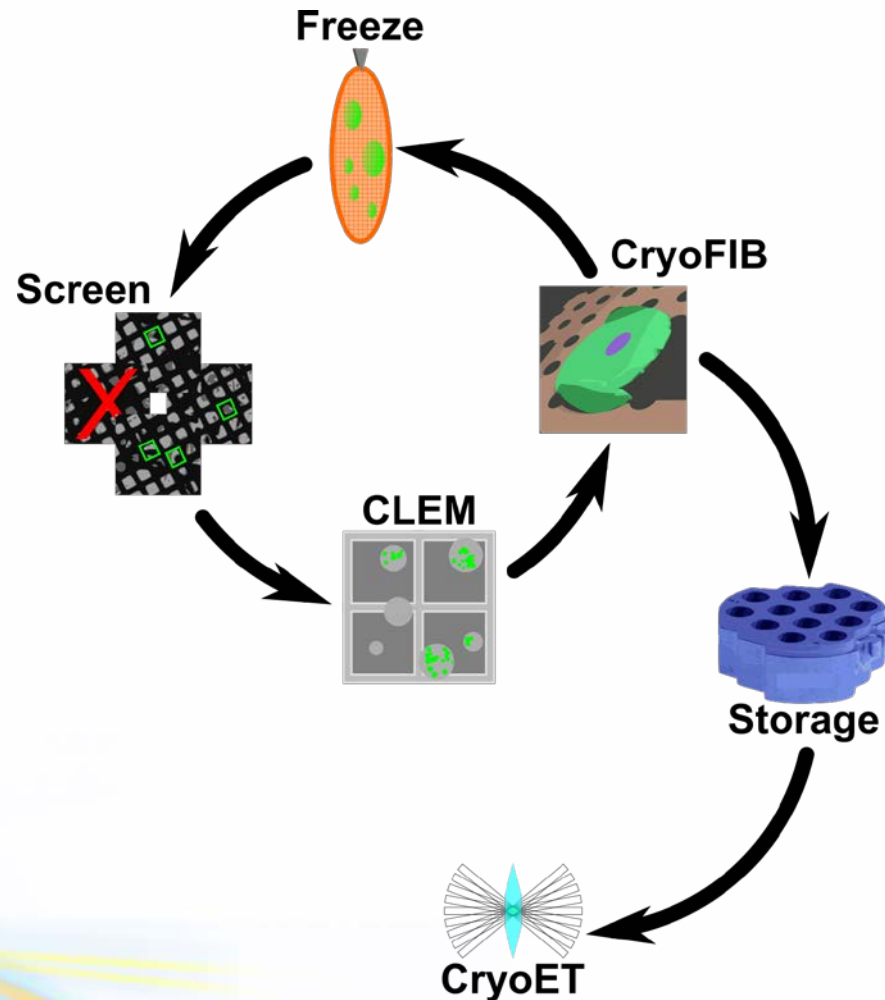
james.gilchrist@diamond.ac.uk



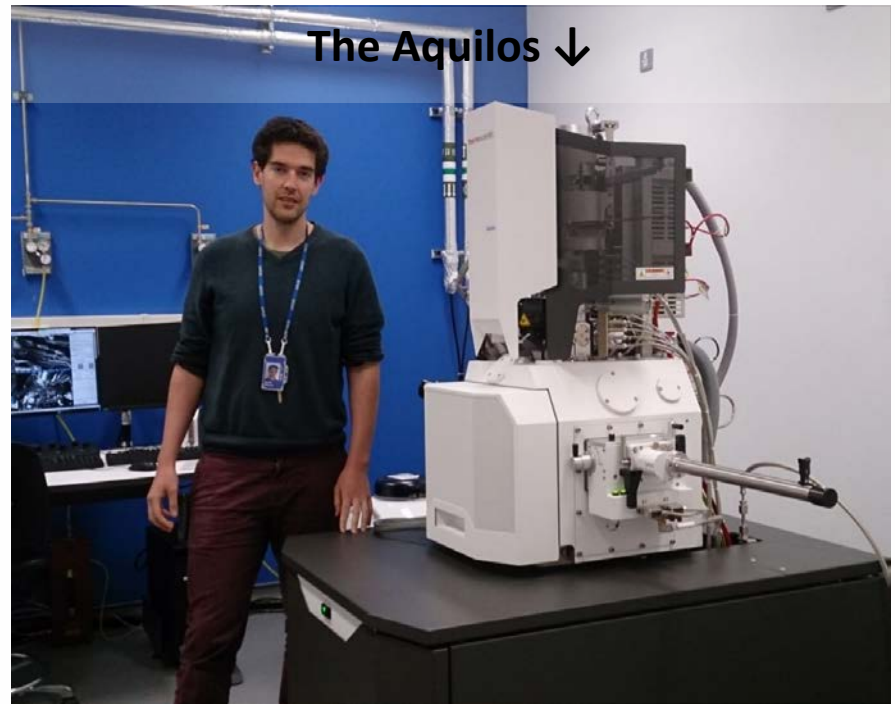
Identifying targets – ice thickness



Lamella tomography workflow



CryoFIB at eBIC – instruments



CryoFIB at eBIC - access

- **Rapid access**

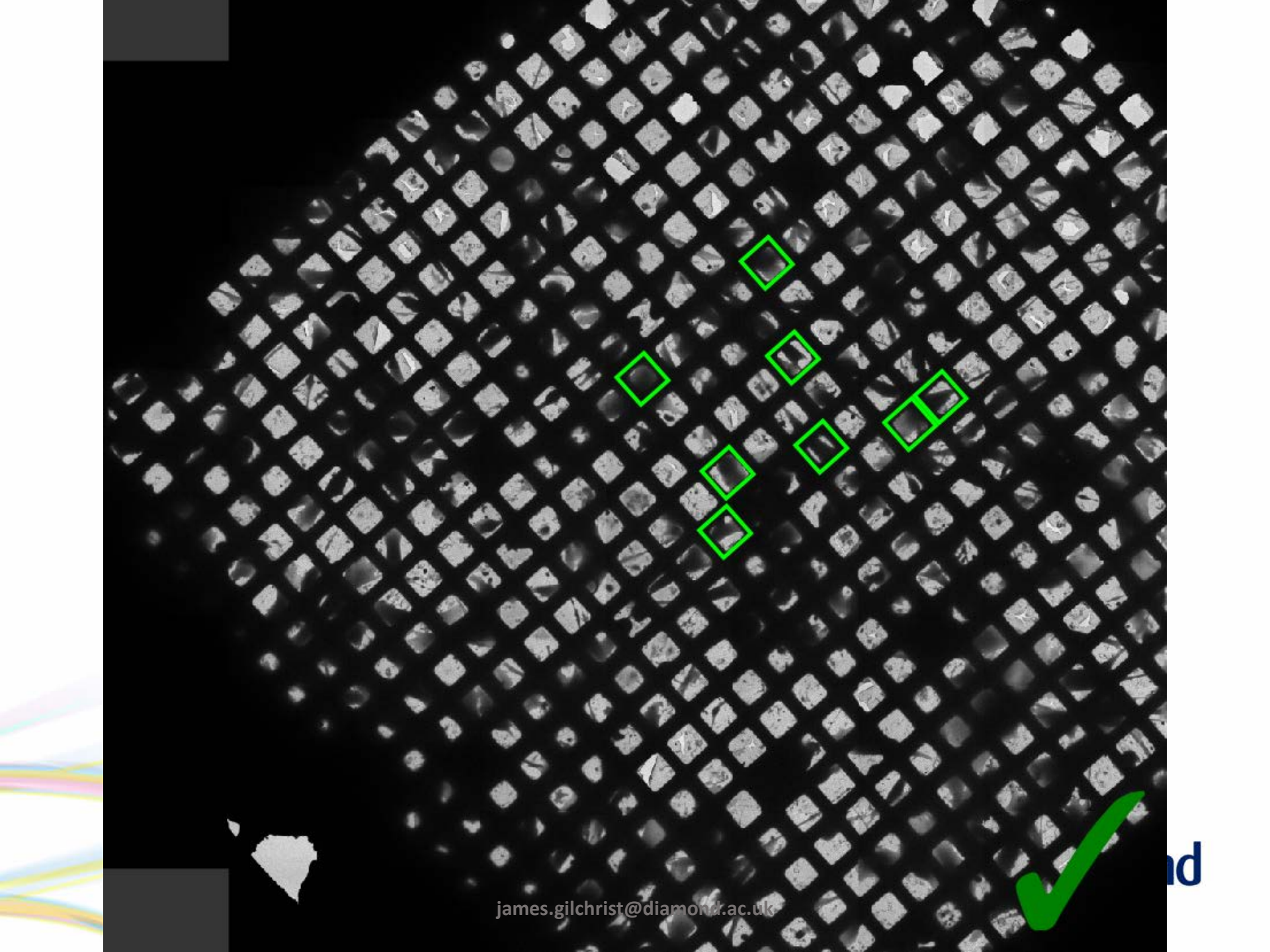
- Single day scheduled
- ET at another institution

- **Standard Access**

- 3 days cryoFIB
- 2 days cryoET on the Krios

CryoFIB at eBIC – access criteria

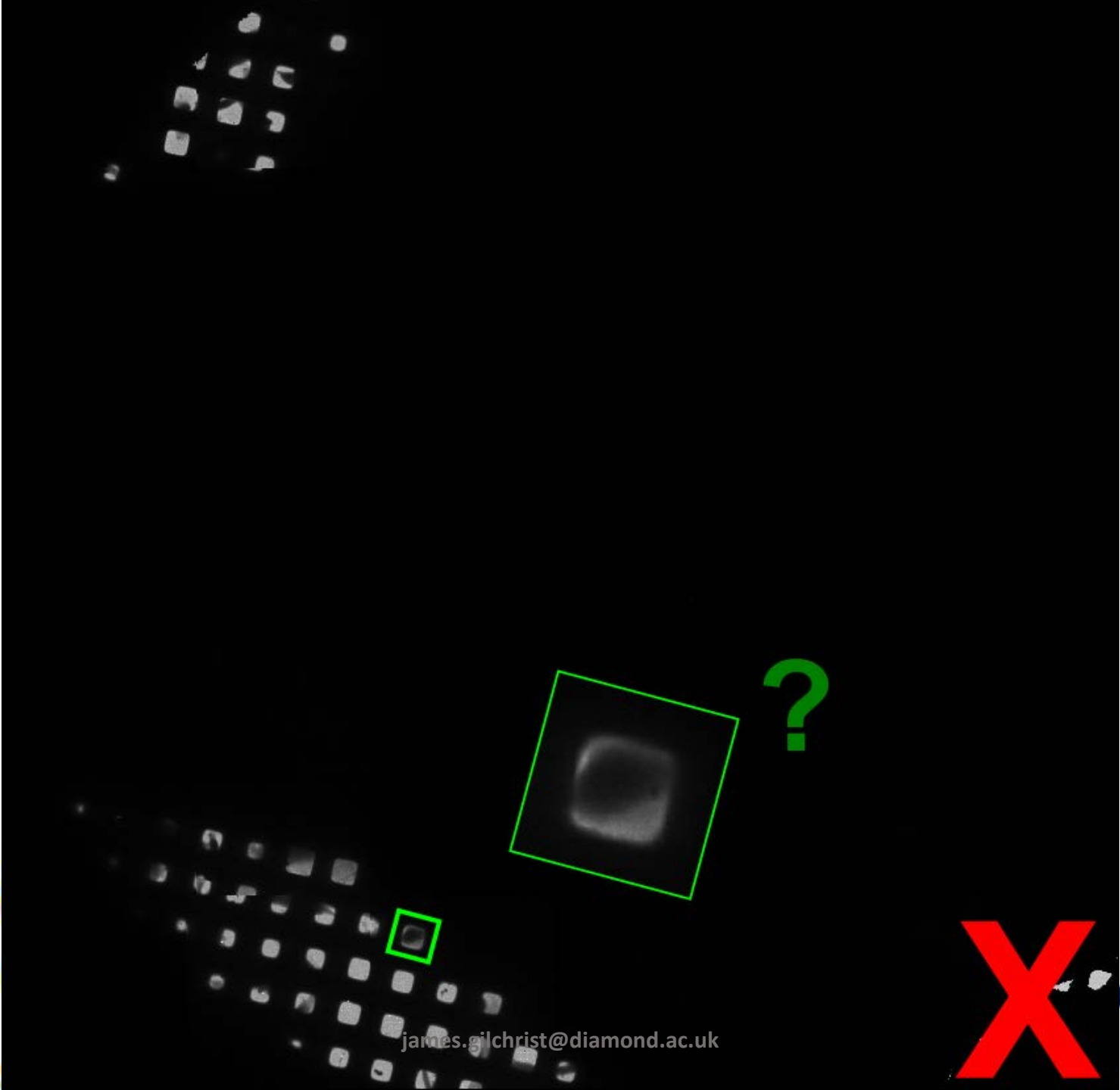
- **Grid quality *i.e.* ice thickness and sample density must be demonstrated**



james.gilchrist@diamond.ac.uk



nd



james.gilchrist@diamond.ac.uk

Xond

CryoFIB at eBIC – access criteria

- **Grid quality *i.e.* ice thickness and sample density must be demonstrated**

James.Gilchrist@diamond.ac.uk

Any questions

eBIC

Peijun Zhang
Director



Alistair Siebert



Dan Clare



Katie Cunnea



Jason van Rooyen



Julika Radecke



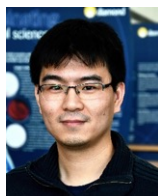
Josh Lobo



Yun Song



Zhengyi Yang



Adriana Klyszejko



James Gilchrist



Yuriy Chaban



Andy Howe



Matt Spink



Former members

Corey Hecksel Kyle Dent



Future of sample preparation

- Automation
- In situ lift-out
- Plasma sources

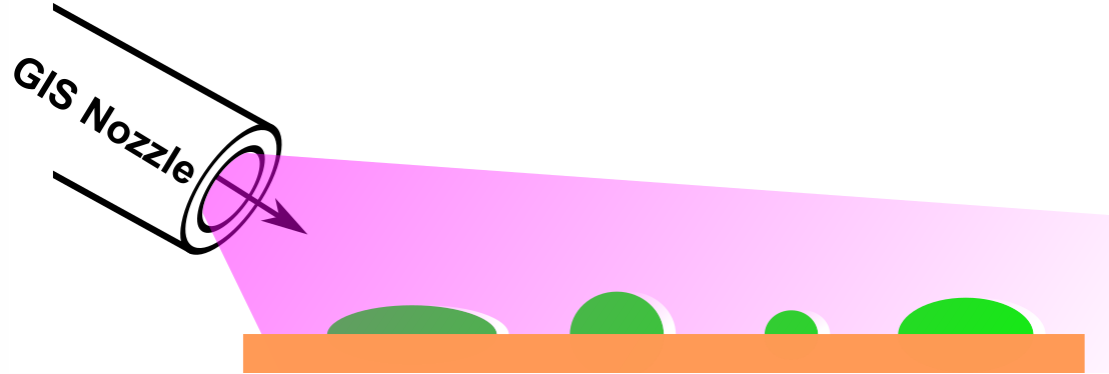
Ion beam Damage

- Local heating is the main damage mechanism

Ion beams



GIS coating (protection)



GIS coating

