CRYOEM 001 :
TOOLS OF THE TRADE – SIDE ENTRY SYSTEMS

NCCAT Embedded Training – Master Class series

October 21, 2020

NATIONAL CENTER FOR
CRYOEM ACCESS & TRAINING

New York Structural
Biology Center

SIMONS ELECTRON
MICROSCOPY CENTER

CRYOEM 001 : SINGLE PARTICLE MASTERCLASS

Introduction to cryoEM: SPA

Building a cryoEM toolkit

EM compatible samples

EM support films and grids

Sample preparation

Tools of the trade:

- microscopes and detectors

Microscope operations

Data collection strategies

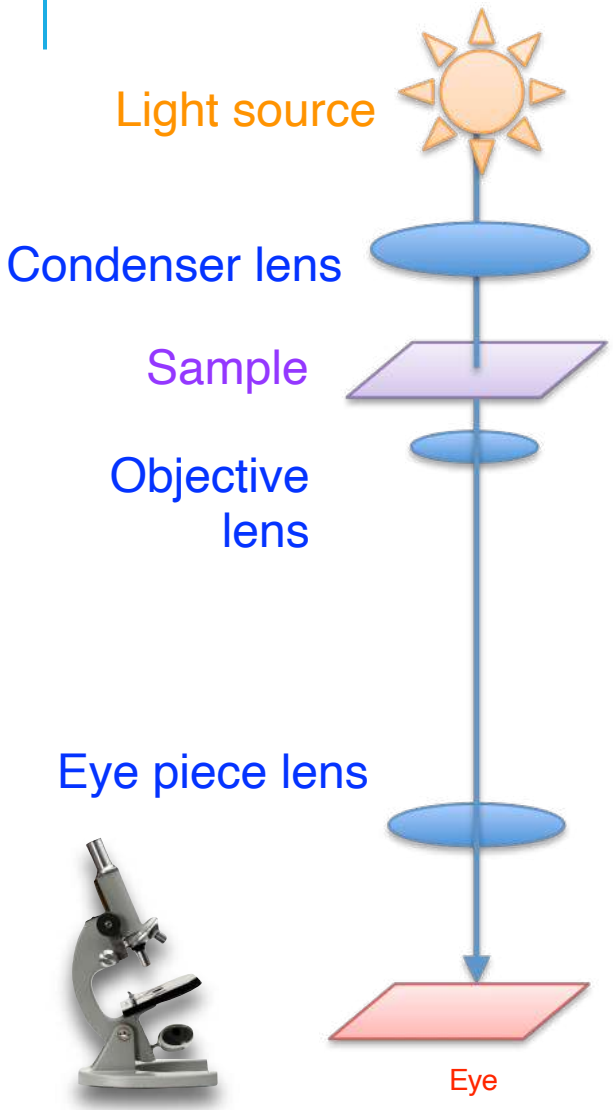
Data assessment & QC

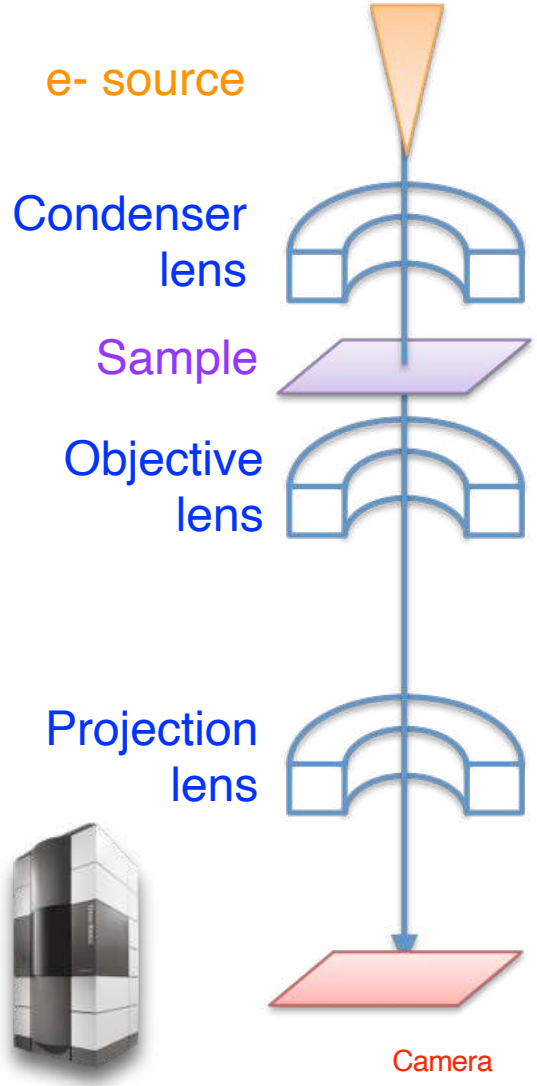
Data processing:

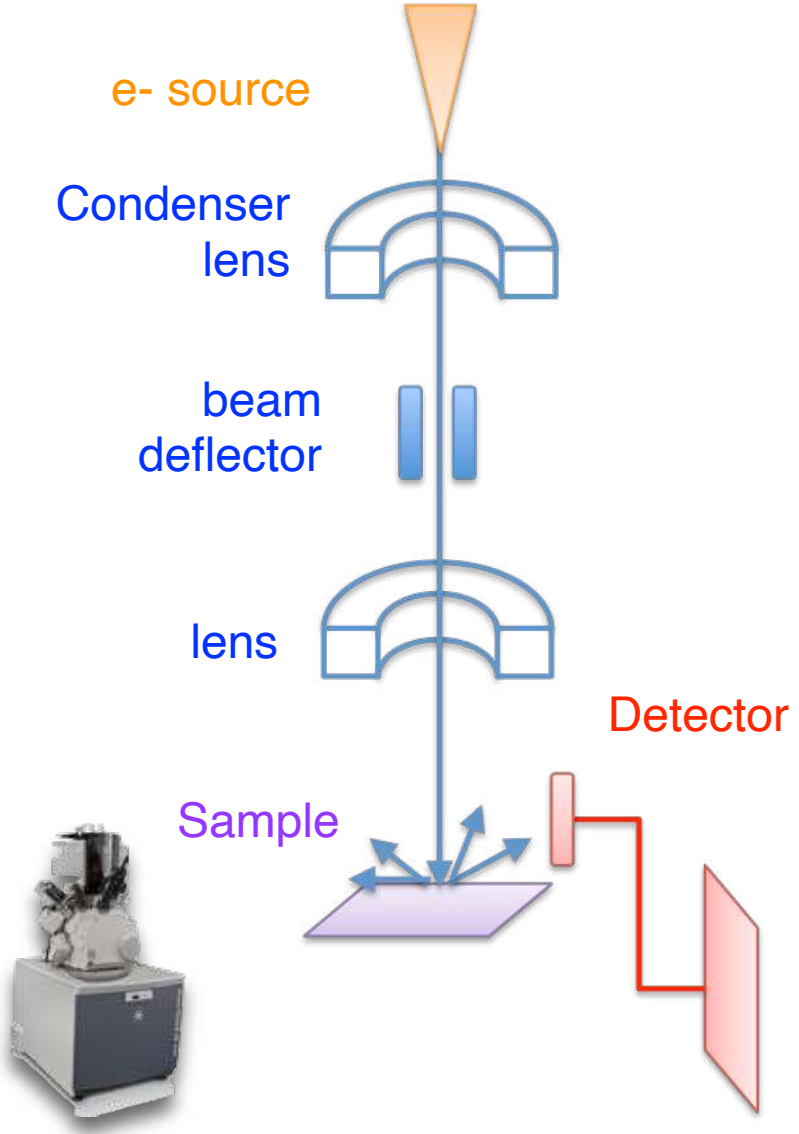
- cryoEM IT infrastructure
- On-the-fly feedback
- 3D Reconstruction

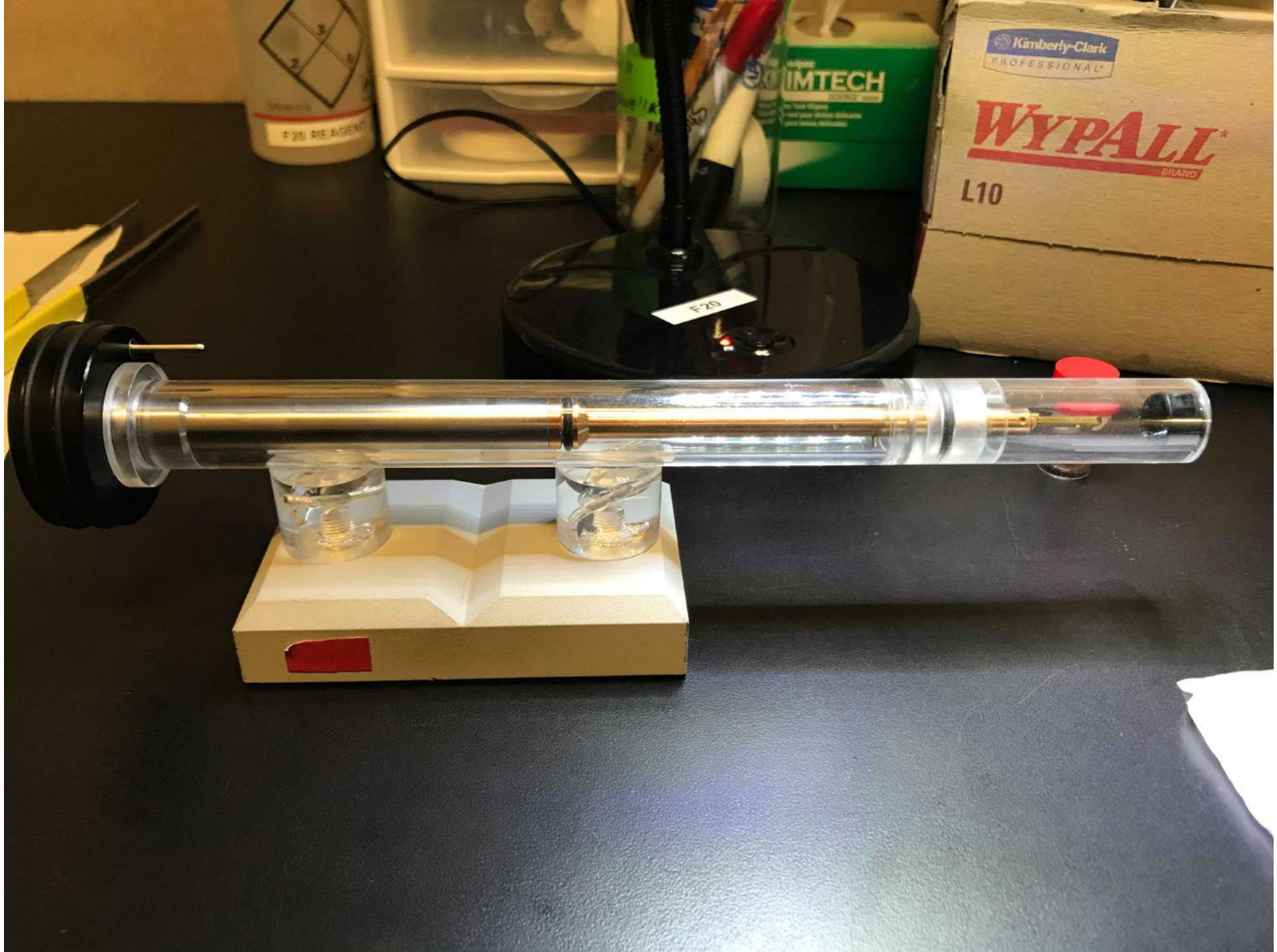
Visualization and validation

CRYOEM TOOLS








Kimberly-Clark
PROFESSIONAL
WYPALL
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IMTECH
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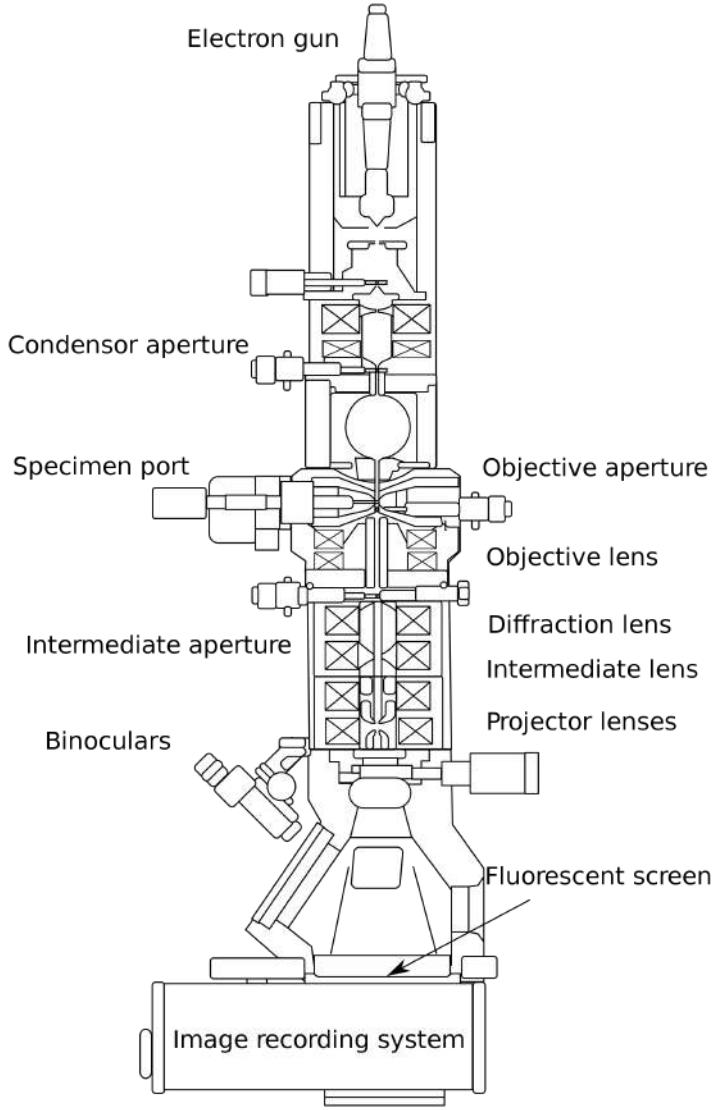
F20

MAIN PARTS OF AN EM



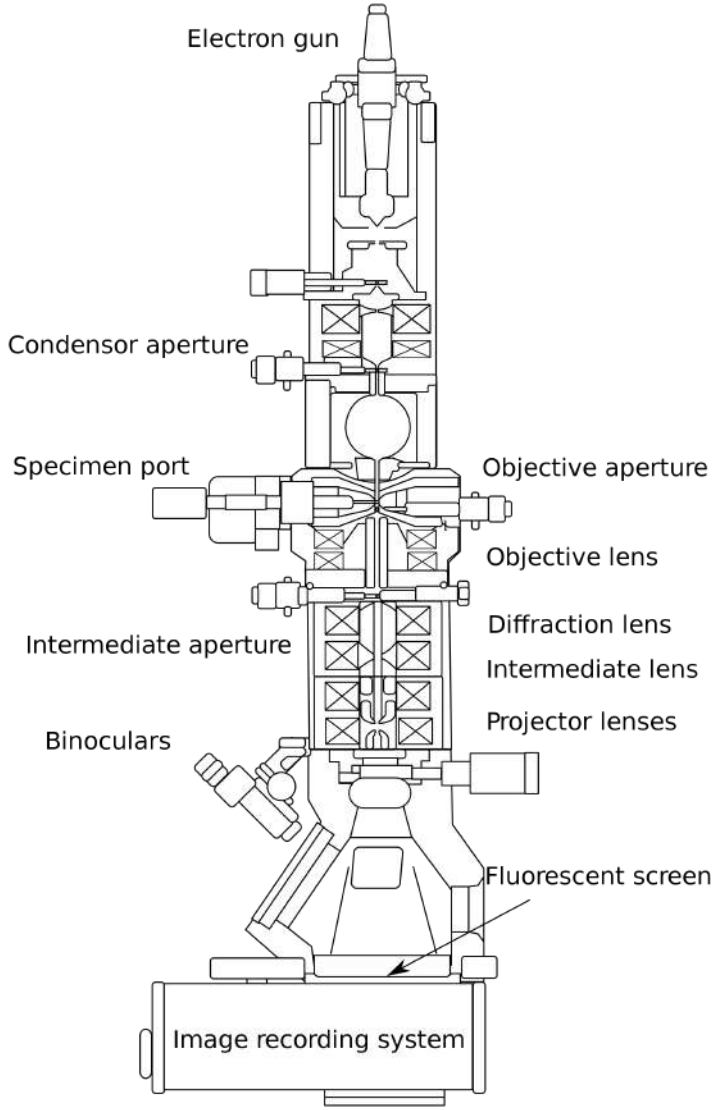
Electron sources

Vacuum systems

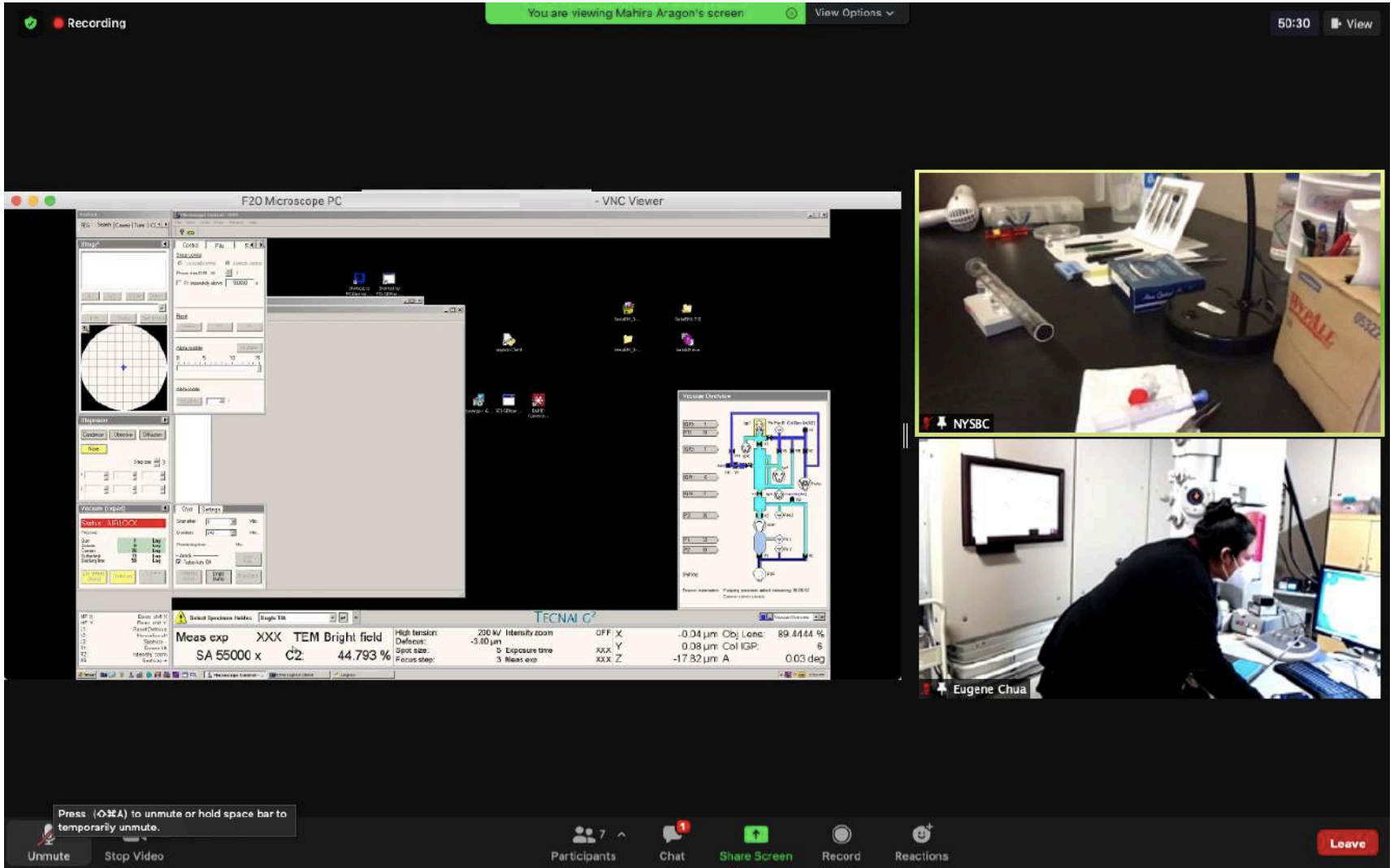
Lenses

Detectors

MAIN PARTS OF AN E

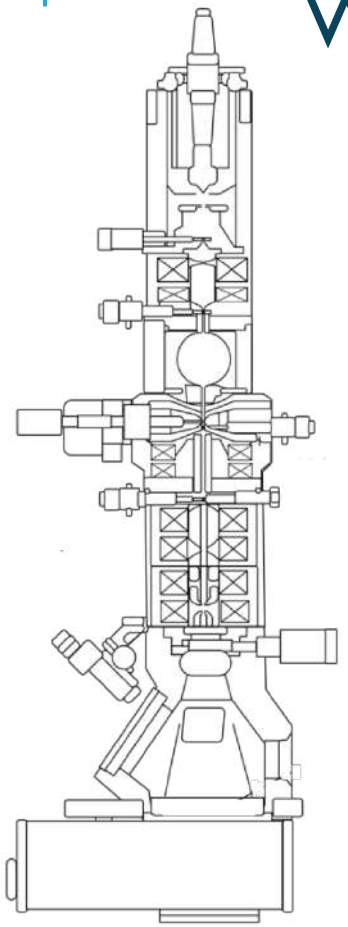


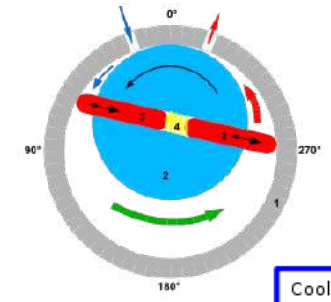
SAMPLE INSERTION

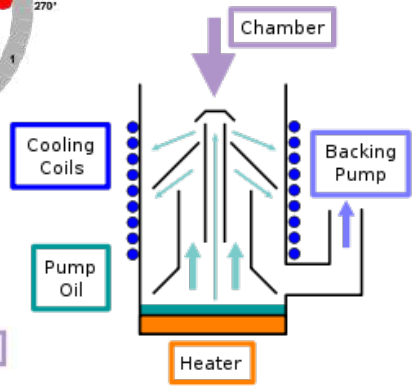


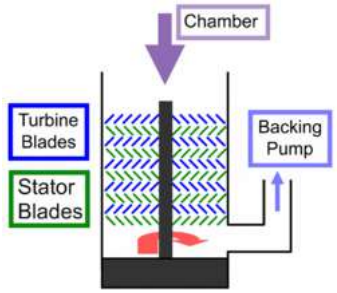
VACUUM SYSTEMS

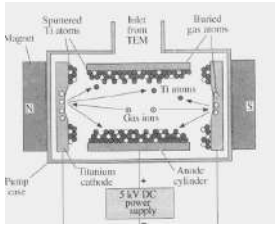
What types of pumps do we have?











wikipedia.com

1 mm Hg = 1 Torr = 10^2 Pa

1 atm = 760 Torr = 7.5×10^4 Pa

PVP / Rotary 1-10^{-3} Torr | >0.1 Pa

Diffusion 10^{-3}-10^{-6} Torr | 0.1-10^{-4} Pa

Turbo 10^{-6}-10^{-9} Torr | 10^{-4}–10^{-7} Pa

IGP 10^{-9}-10^{-12} Torr | 10^{-7}-10^{-9} Pa

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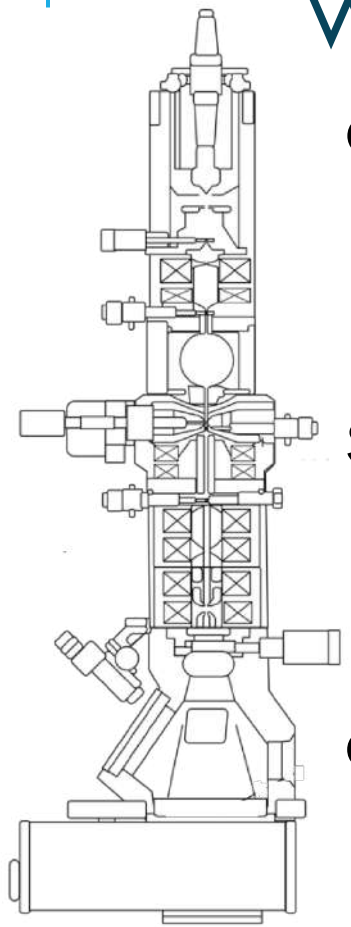

Gun 10^{-9} Torr

Specimen 10^{-6} -10^{-7} Torr

Chamber and Camera 10^{-5} -10^{-6} Torr

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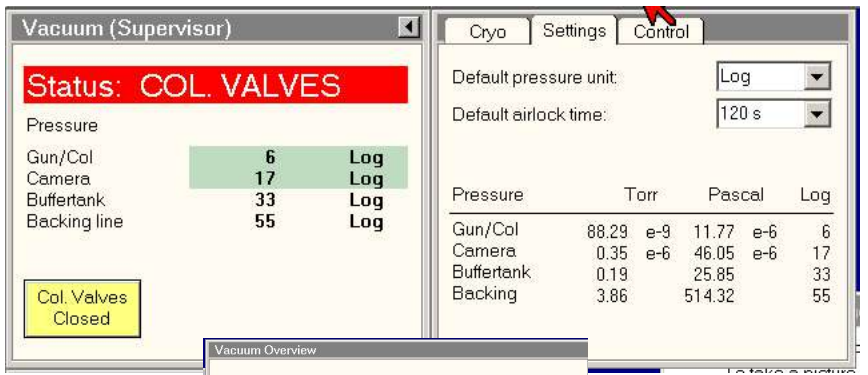
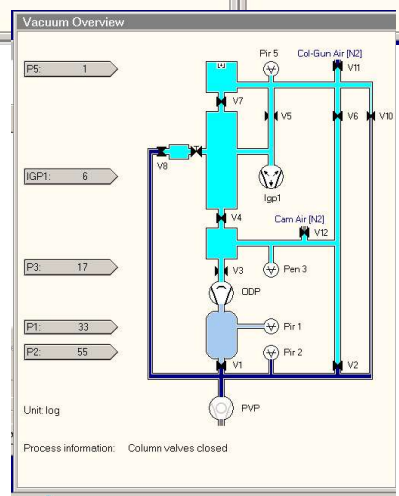
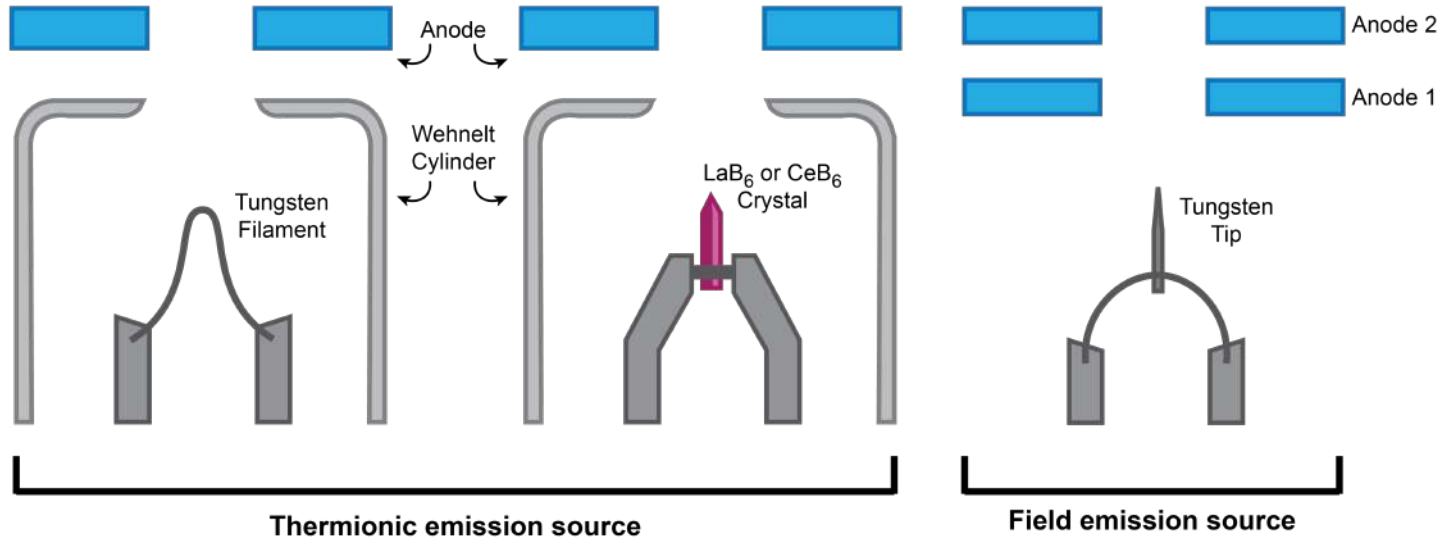




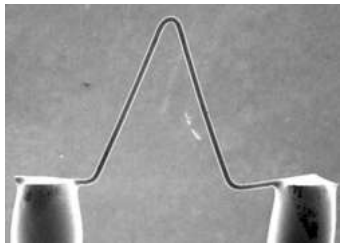
ELECTRON SOURCES

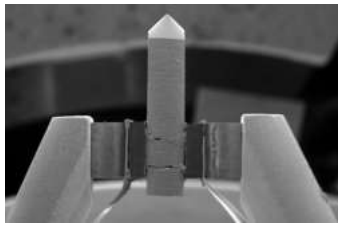
What are the 3 main kinds of electron sources?

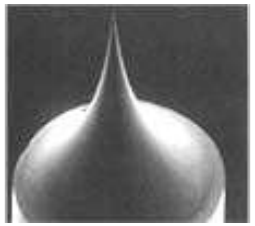


www.thermofisher.com

nanoscience.com

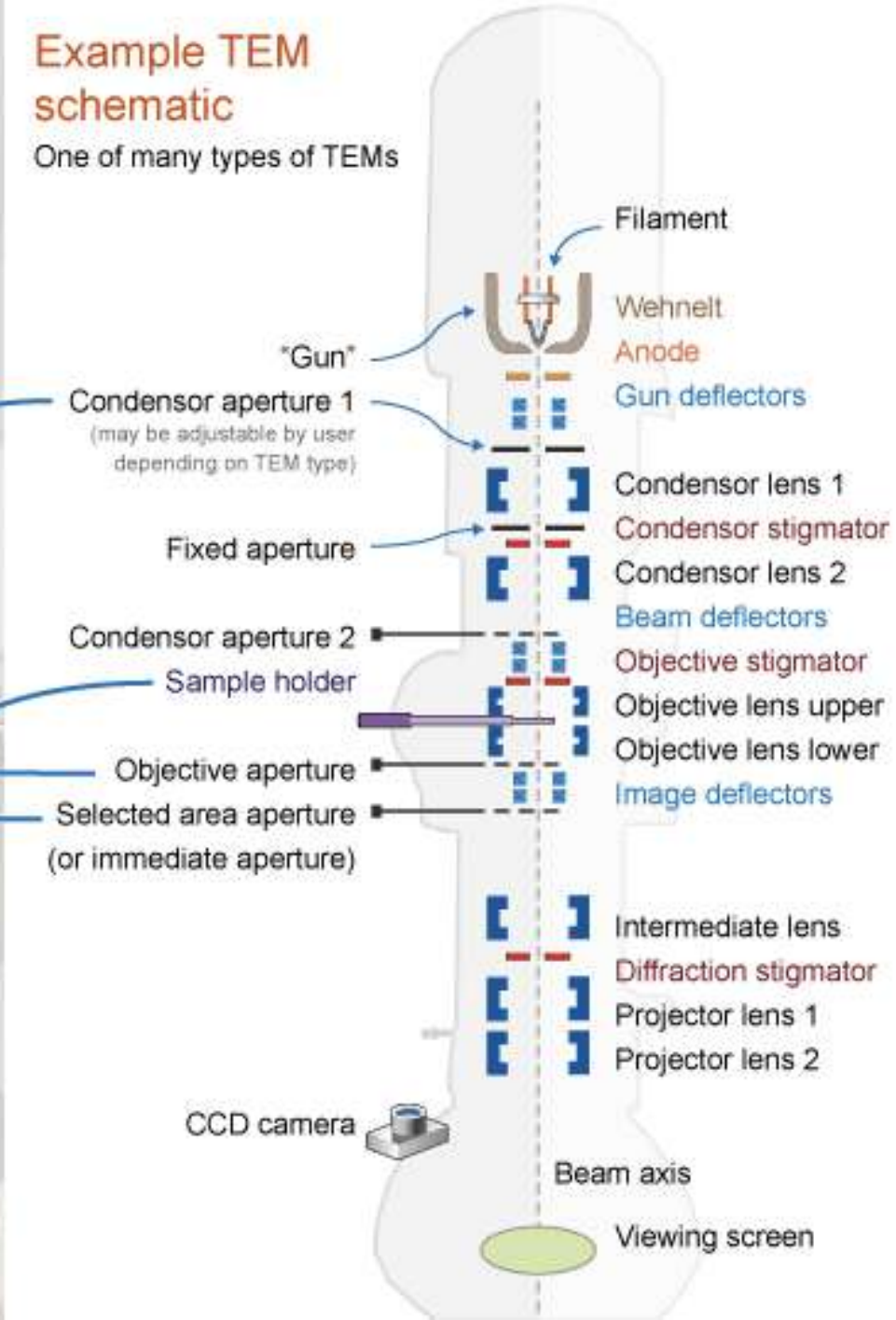




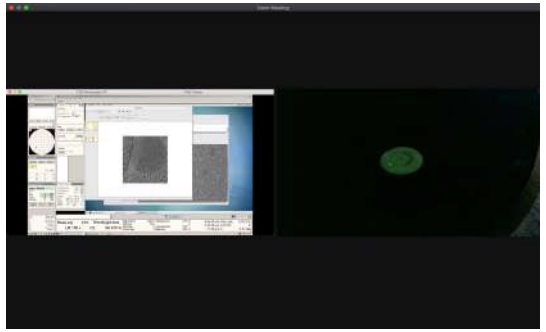


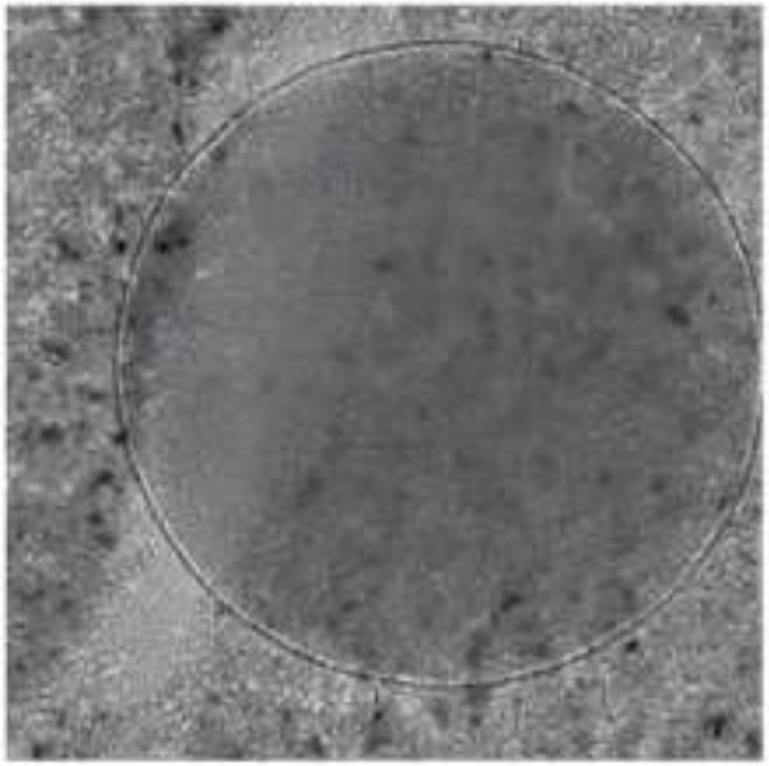
Example TEM schematic

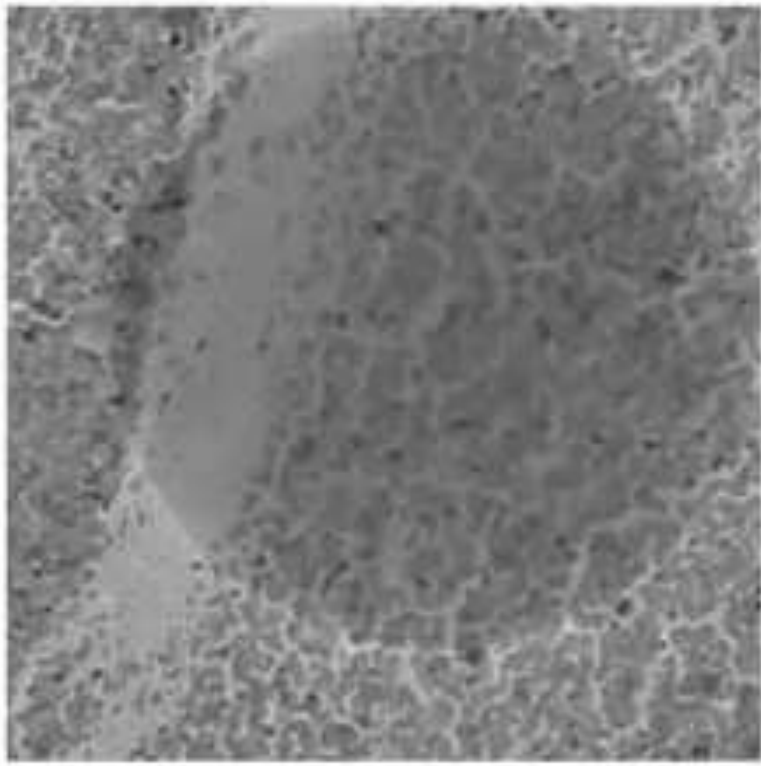
One of many types of TEMs

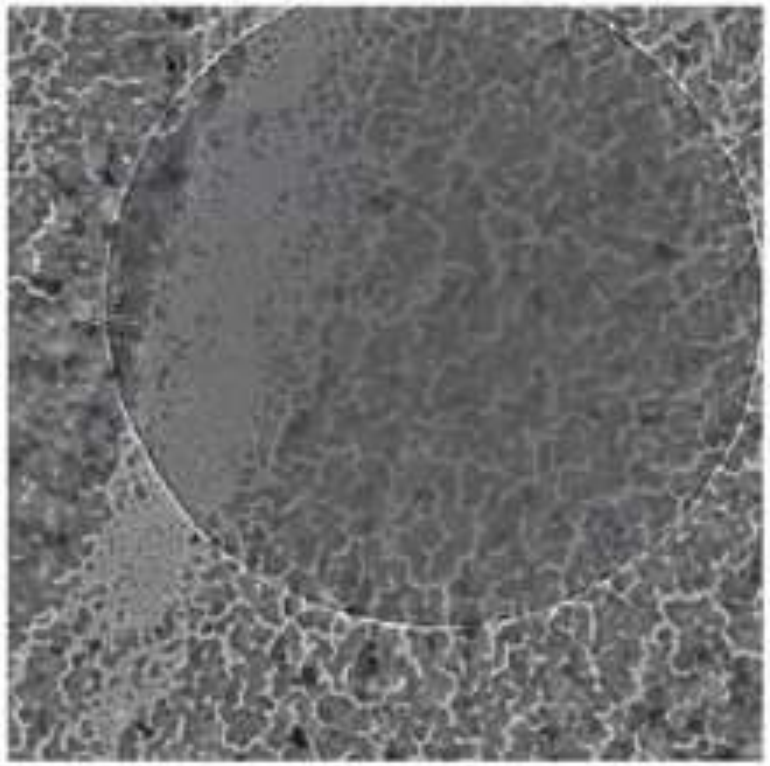


FOCUS









cryoEM 001 : Single Particle Masterclass

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