

Towards more dose efficient cryogenic electron microscopy of biological samples

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PROPOSITIONS

for the defence of the thesis

TOWARDS MORE DOSE-EFFICIENT CRYOGENIC ELECTRON MICROSCOPY OF BIOLOGICAL SAMPLES

Yue Zhang

5 June 2023

1. We have to remember that what we observe is not nature in itself, but nature exposed to our method of questioning. — Werner Heisenberg
2. Curiosity is an intrinsic source of motivation that drives learning, exploration, and discovery. (Like a cat.)
3. Balance your work and life.
4. Hen egg white lysozyme could be solved using SPA cryo-EM, given sufficient hardware and software developments, particularly when utilizing an idea phase plate (chapter 3).
5. Charging is an important and fundamental issue when imaging non-conducting specimens, such as life science samples, in TEM, as it can affect our observations and the interpretation of the results (chapter 4).
6. The affordability of lower-energy microscopes with HPD enables wider access to cryo-EM technology for researchers and labs, which could lead to new discoveries and advancements in understanding complex biological processes (chapter 5).
7. Using cryo-EM for biological specimens involves more than just exposing the sample to a parallel flood beam to obtain its projections; more techniques that provide better dose efficiency are available (chapter 6).
8. It is possible that the actual impact of your research could surpass your anticipated outcomes.