

Laboratory for BioMolecular Structure

Liguo Wang

The 5th LBMS annual cryo-EM course

June 3-6, 2025

Laboratory for BioMolecular Structure

LBMS is a center for life science imaging that offers access to state-of-the-art cryo-electron microscopes and laboratory equipment for studies on the building blocks of all living organisms and their behavior.

<u>Mission</u>: to support and enhance BER mission research through the **development**, **operation and continued improvement** of a state-of-the-art electron microscopy facility optimized for solving BER-related challenges.

Focus: complex interactions specifying the function of entire biological systems

- from molecules to organelles, cells and multicellular organisms



Laboratory for BioMolecular Structure







LBMS statistics: CY 2021-2023



Year	Days used by users	Images collected	Structures determined (<=4Å)	Number of EMDB deposition	Number of publications
CY2021	123	533,287	50	1	1
CY2022	229	809,032	71	26	10
CY2023	233	1,019,736	116	53	18
CY2024	258	1,033,860	82	73	20

3-tier Training: Annual cryo-EM course since 2021



3-tiered training: semi-annual in-person workshops





Important websites and contact information









Video/recording

LBMS website

Cryo-EM course

Cryo-EM workshops

- Nancye Wright, Proposal Coordinator: 631-3445132, wright@bnl.gov ٠
- Guobin Hu, EM Scientist: ٠
- Jake Kaminsky, Scientific Associate: 631-3448980, jkaminsky@bnl.gov ٠
- Liguo Wang: ٠



631-3447915, ghu@bnl.gov

- 631-3447011, lwang1@bnl.gov



Thank you!



Access to Electron Microscopes (EMs) at LBMS



High-resolution EM

Users will be trained virtually. Users' presence is required (Zoom meeting). **I Brookhaven** National Laboratory

Laboratory for BioMolecular Structure

U.S. DEPARTMENT

ome Facilities - For Users - Research - Advisory & Review Cmtes For Industry News Wiki

User Guide

Get Started as an LBMS User

All Laboratory for BioMolecular Structure (LBMS) microscope time is allocated based on a peer-reviewed proposal process. LBMS operates in two 6-month cycles: January – June (proposal deadline Sept 15) and July – December (proposal deadline March 15). All microscope time is requested each cycle through the web-based <u>Proposal</u> <u>Allocation, Safety, and Scheduling System</u> (PASS) system.

In this system, a proposal describes the scientific experiments to be performed and identifies the experimental team. Proposals have different durations depending upon the type of proposal submitted. For any proposal that has a duration of more than one cycle, an experiment time request (ETR) must be submitted for every cycle that a user needs microscope time. Every proposal also requires a Safety Approval Form (SAF), which is also submitted through the PASS system once microscope time is allocated.

To start, you need to know three things:

- What type of proposal fits your needs? See the description of proposal types below for more details.
- 2. Do you need a screening microscope, high-end microscope, or both? Here are the instruments available at the LBMS.

3. Do you want to perform single-particle cryo-electron microscopy (cryo-EM) or cryo-electron

🖹 User Guide Contents

Apply for Microscope Time

- Get Started as a User
- Determine your proposal type
- Determine your microscopes
- Submit a proposal online

Proposal Evaluation and Scoring

- Feasibility review
- Scientific merit review
- Rating criteria and scoring

Prepare for Microscope Time

- Register for user appointment
- <u>Complete training</u>
- <u>Submit Safety Approval Form</u>
- <u>Request user account and data</u> access
- Sample shipping
- Travel and housing

https://www.bnl.gov/cryo-em/userguide/

LBMS leadership

Science Advisory Committee

Name	Affiliation
Huilin Li (Chair)	Van Andel Institute
Daniela Nicastro	UT Southwestern Medical Center
Alexis Rohou	Genentech Inc.
John Shanklin	Brookhaven National Laboratory
Fred Sigworth	Yale University
Sharon Wolf	Weizmann Institute of Science, Israel
Elizabeth Wright	U. of Wisconsin- Madison
Chen Xu	U. of Massachusetts Medical School

LBMS team



Sean McSweeney Liguo Wang Director of BEPSD Scientific Operations **Director of LBMS**



Scientist



Jake Kaminsky Scientific Associate



Qun Liu PI, Biology Dept. BNL Yale



Yong Xiong Professor

SBU



Dongyan Tan **Assistant Professor**



Jun Liu Professor Yale



Implement, optimize, and develop cryo-ET workflows



LBMS open for general research

- 2 proposal cycles per year:
 - January June (proposal deadline September 15)
 - July December (proposal deadline March 15)
- General User (2 years) most common form of user access for routinely-supported experiments
- Block Allocation Groups (BAGs, 2 years) groups of researchers that want to combine their short microscope time requests into a single proposal to permit greater flexibility in beam time scheduling
- Rapid Access (6 month) rapid access to instrument time for "hot topics" or for straightforward experiments with a fast turnaround time
- Proprietary full cost-recovery instrument time
- BER outreach activity (no proposal required)

- Guaranteed: 200 days/year
- Users GU/BAG: 52.5%
- Users Rapid: 7.5%
- Outreach: 15.0%
- Development: 10.0%
- Collaboration: 7.5%
- Proprietary: 7.5%

Brookhaven National Laboratory

https://www.bnl.gov/cryo-em/userguide/