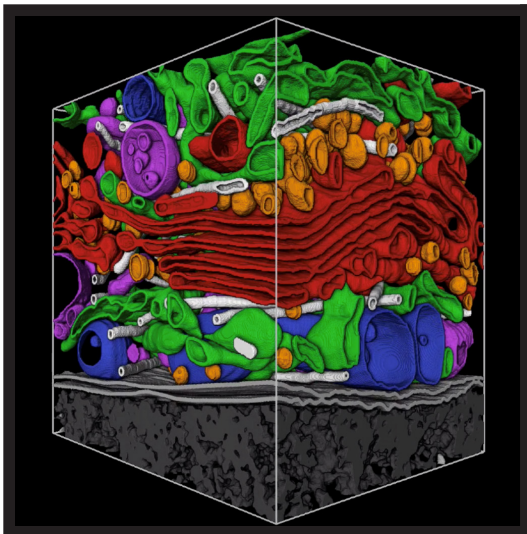
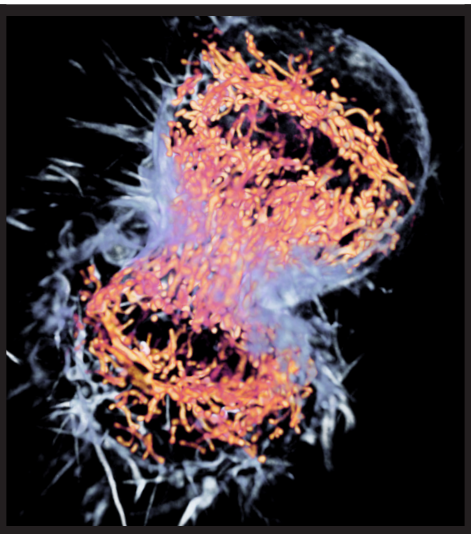
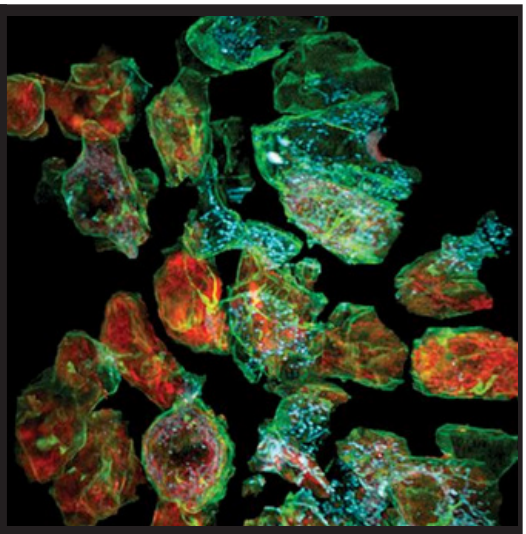
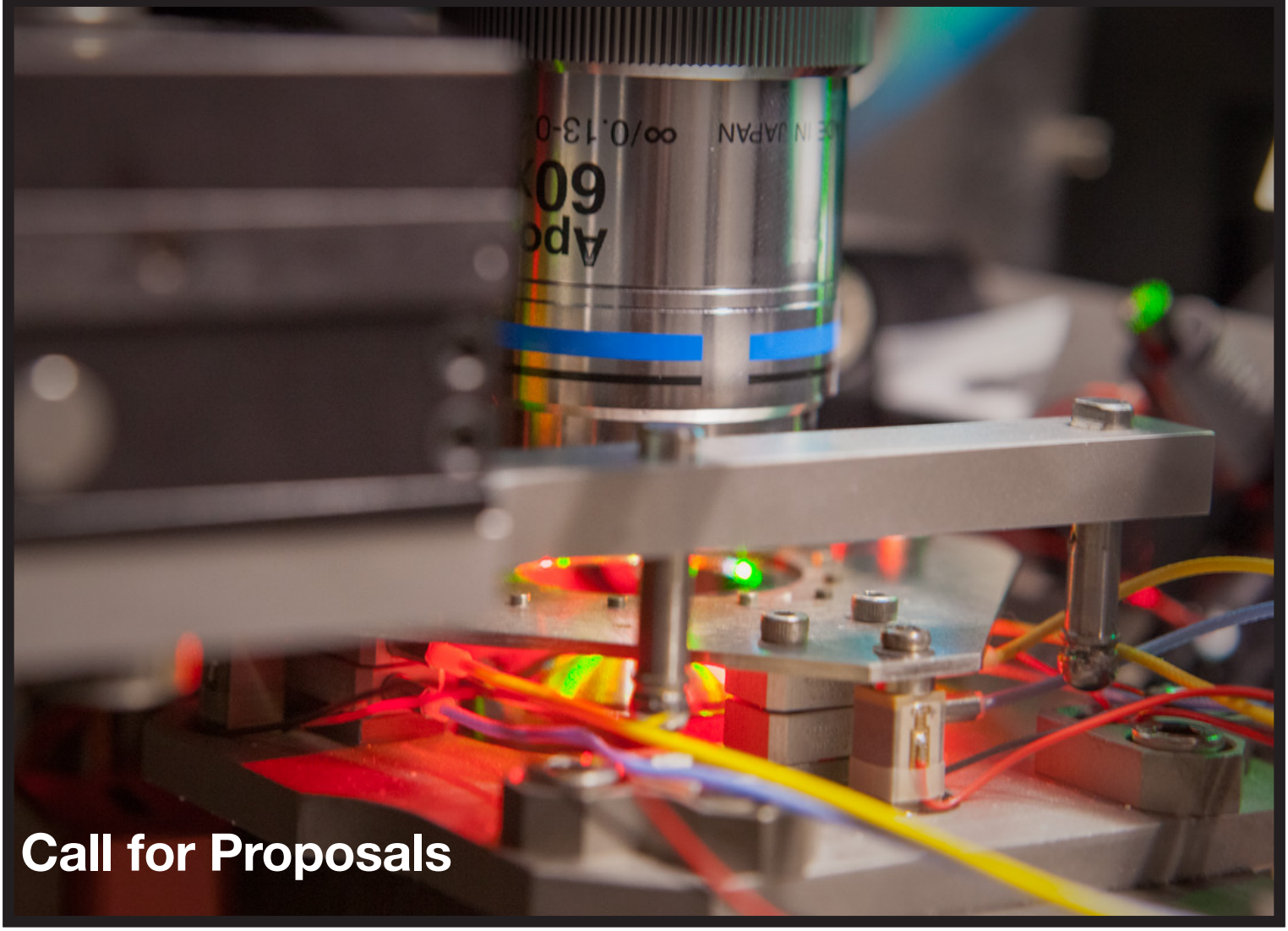






THE ADVANCED IMAGING CENTER
AT JANELIA RESEARCH CAMPUS



Call for Proposals

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GORDON AND BETTY MOORE FOUNDATION

aicjanelia.org

Call for Proposals

THE ADVANCED IMAGING CENTER AT JANELIA RESEARCH CAMPUS

We are now accepting proposals from scientists who are interested in conducting experiments at the Advanced Imaging Center (AIC).

Submit a proposal by January 31, 2023

17:00 (5:00 PM) US Eastern Time / 21:00 (9:00 PM) GMT

Our Mission

The AIC makes cutting-edge, pre-commercial microscopes available to visiting scientists at no cost, maximizing the impact of the latest developments in emerging microscopy technologies.

Program

We encourage applications from scientists who are addressing significant scientific questions that require measurements of cellular/molecular behavior at spatial and/or temporal resolutions that would only be possible through access to the AIC.

Upon approval, visiting scientists spend 2-3 weeks at Janelia conducting experiments on their chosen microscope(s) with the support of the AIC team. Janelia covers the costs of lodging for the visiting scientists, technical support, and scope time. Basic experimental reagents (e.g. tissue culture plates, pipettes, coverslips) will be provided. Other experimental reagent costs may be covered at the discretion of the AIC.

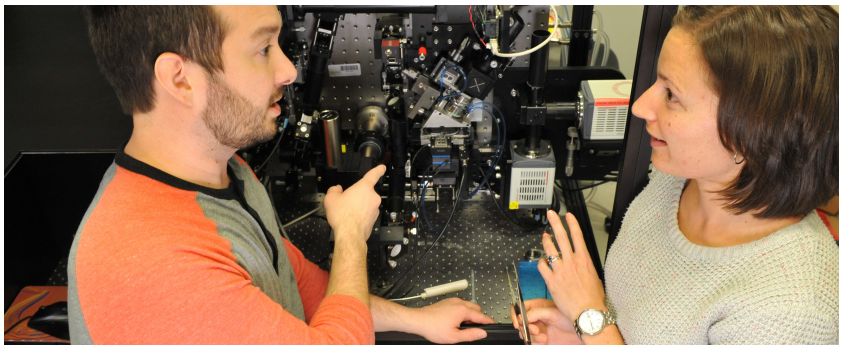
This program is open to investigators at non-profit institutions. HHMI affiliation is not required.

Contact

Apply: aicjanelia.org/apply

Email: aic@janelia.hhmi.org

Twitter: @aicjanelia



Lattice light sheet microscope training for AIC visitor, Kate Butler, from the Walter and Eliza Hall Institute

Instructions

Prior to proposal submission, applicants are strongly encouraged to contact the AIC (aic@janelia.hhmi.org) for technical consultation.

All proposals must adhere to the following format:

- **Scientific Narrative** (limited to 1,000 words and 3 figures), which should include:
  - **Abstract**: Briefly summarize the main project goals and significance, the instrument(s) to be used, as well as the biological system and fluorophores that will be employed.
  - **Specific Aims**: Define the major hypotheses to be tested and a brief outline of the experimental approach.
  - **Preliminary Data**: Showcase previous imaging data that (1) demonstrate the feasibility of the proposed project, such as fluorophore photostability, signal-to-noise or signal-to-background, probe labeling specificity, labeling strategy, and transfection efficiency, and (2) illustrate the limitations of current imaging technology. The AIC team can provide in-depth technical advice.
  - **Justification for Using AIC Instrument(s)**: Explain why commercially-available microscopes are insufficient to address your specific aims.
  - **Experimental Design**: Provide a detailed plan for addressing the proposed specific aims. Explain the biological system(s) and labeling strategies to be employed. Specify the expected imaging duration, speed, depth, and resolution.
  - **Data Quantification Strategy**: Outline how the data will be analyzed and/or quantified to yield biologically relevant information. Explain how the relevant data quantification helps support your anticipated measurable outcome. Contact the AIC for advice.
  - **Measureable Outcome(s)**: To assist us in understanding the immediate impact of your proposed work, describe the final deliverable that answers the “so what?” question after successful data collection and analysis. Potential impacts could include generation of a novel hypothesis, preliminary data for a grant application, critical data to enhance or complete a manuscript in preparation, or other.
  - **List of Cited References**
- **Biosketches** of all personnel that will visit the AIC
- **Letter of recommendation** for all non-lab head personnel from their respective lab head(s). See personnel section below.

Janelia's unusual research culture values collaboration and vibrant intellectual life, which is reflected in our history, our philosophy, and our campus.

Proposal Review

All applications are evaluated using a two-tier review process. The first tier is a pre-screening process by the AIC team to determine technical appropriateness and feasibility. The panel will determine whether: (1) the experimental design suits the capabilities of the AIC instruments; (2) the need for the AIC instrument is technically justified; and (3) the specimens can be safely handled by Janelia's capacity (we can only receive and handle up to BSL2 samples). The second tier is a peer review of applications against established criteria for determining scientific merit. The panel includes representatives from Janelia Research Campus and the Gordon and Betty Moore Foundation, as well as invited extramural imaging experts.

Review Criteria

- Does the proposed project have the potential to yield novel and significant information?
- Does answering the experimental question require the use of the AIC instruments, or can it be addressed with commercially available imaging technologies?
- Is the proposal well-designed and sufficiently focused to be completed efficiently within a reasonable amount of time?
- Are the visiting scientists' background, productivity, and expertise appropriate to accomplish the proposed work with the assistance of the AIC scientists?

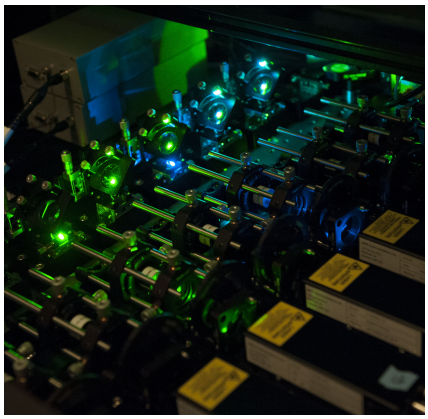
Personnel

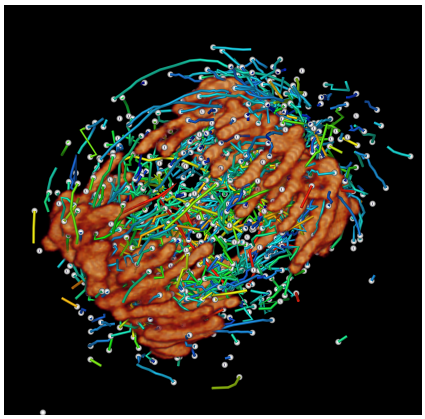
It is strongly encouraged that the lab head be present for a portion of the visit. All other visiting personnel must have a specified role in the experiment(s) and a letter from their lab head describing their ability to accomplish that role. The panel will evaluate how the designated visitor will help in accomplishing the goals of the proposal with the full assistance of AIC scientists. If the lab head cannot be present, it would be imperative that the visiting personnel have sufficient experience working independently.

Budget

Janelia will provide on-site housing at no charge. The applicant should confirm that they are able to support travel and food costs for the personnel who will visit the Janelia campus to perform the experiment(s).

Near right:
Pre-commerical microscope developed at Janelia
Far right:
High speed tracking of microtubule dynamics during cell division using the lattice light sheet microscope.





Our Microscopes

Interferometric Photoactivated Localization Microscope (iPALM)

iPALM pinpoints fluorescent labels to within 10–20 nanometers—about ten times the size of an average protein—in all three dimensions. iPALM has been used to reveal how biomolecules organize themselves into the structures and signaling complexes that drive cellular functions in fixed samples.

Focused Ion Beam-SEM (FIB-SEM)

FIB-SEM can give exquisite ultrastructural detail in biological samples. Commercially-available systems suffer from practical limitations that result in only a few microns of the sample volume being imaged without errors. The enhanced FIB-SEM at the AIC is specifically engineered to overcome these limitations. It allows for consistent, isotropic 4nm resolution over whole cell volumes and beyond, making it an unparalleled EM technique. FIB-SEM can be combined with our Cryo Structured Illumination microscope for Correlative Light-Electron Microscopy (CLEM) studies.

Lattice Light Sheet Microscope (LLSM)

This LLSM uses a thin sheet of patterned light to peer inside living cells and small organisms, revealing the three-dimensional shapes of cellular landmarks in unprecedented detail. The microscope images at high speed and under gentle illumination so researchers can create dazzling movies that make biological processes, such as cell division, come alive.

Simultaneous Multiview Light Sheet Microscope (SiMView)

SiMView enables quantitative systems-level imaging of fast dynamic events in large living specimens, enabling researchers to understand the development/function of complex biological systems. It delivers exceptionally high volumetric imaging speeds and a large field of view while minimizing photobleaching and phototoxic effects. Its spatiotemporal resolution eliminates motion blur artifacts of specimen movement while providing high performance and accuracy for precise quantification and tracking of biological processes.

Multimodal Optical Scope with Adaptive Imaging Correction (MOSAIC)

By using a 2P laser spot (a “guide star”) that is focused in the imaging volume, wavefront sensing allows for quantification of the aberration the light experiences. This aberration can then be corrected by a deformable mirror (emission correction) or adjusting the shape of the incoming light with a spatial light modulator (excitation correction). Images stay in focus, even in thicker and more complex samples. This instrument integrates many imaging modes on the same instrument, with adaptive imaging correction for all modalities.