

# Postdoctoral Scholar - Department of Physics - University of California, Berkeley

Job #JPF03273

- Physics / College of Letters & Science - Mathematical & Physical Sciences / UC Berkeley

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## POSITION OVERVIEW

**Position title:** Postdoctoral Scholar

**Salary range:** Commensurate with experience

**Percent time:** 100%

**Anticipated start:** Spring 2022

**Position duration:** Initial position will be for two years, with the possibility of an extension depending upon performance and availability of funding.

## APPLICATION WINDOW

**Open date:** November 23rd, 2021

**Next review date:** Tuesday, Dec 7, 2021 at 11:59pm (Pacific Time)

Apply by this date to ensure full consideration by the committee.

**Final date:** Monday, Jan 31, 2022 at 11:59pm (Pacific Time)

Applications will continue to be accepted until this date, but those received after the review date will only be considered if the position has not yet been filled.

## POSITION DESCRIPTION

As part of the Holger Mueller Research Group, in the Department of Physics, at the University of California, we seek applications for postdoctoral researchers in the areas relevant to developing and using a laser-based phase plate for electron microscopy. Areas of previous experience might include experimental physics, biological electron microscopy, or innovative use of software for data collection and analysis in the area of cryo-EM and tomography.

Depending on the background of the applicant, the job responsibilities may include one or more of the following:

- Constructing, operating, and optimizing new laser hardware for laser-based phase contrast, increasing usability and reliability, minimizing imaging artifacts, or for realizing advanced imaging modalities;
- application of laser-based phase contrast and new imaging modalities that are enabled by the laser phase plate to biological problems, using cryo electron tomography, including identifying biological problems, preparing samples, and running data-taking campaigns;
- finding or developing optimized strategies to process data generated with the laser phase plate as well as developing new imaging and data analysis strategies to obtain atomic resolution readouts of the entire proteome.

We seek highly motivated candidates with past research success and interest in developing and applying instruments for the biological sciences. In particular, we are looking for candidates in three areas:

- Laser physics, including infrared lasers, frequency stabilization, optical resonators, servo loops, the physics of optomechanics, laser-electron interactions, as well as mechanical construction of stable optical systems;
- Biological electron microscopy, including prior experience such as use of a phase plate, biological sample preparation, single-particle cryo-EM, cryo-ET, and FIB milling;
- Using, developing, and refining image processing as well as interactive software to automate the data-taking process; adding scripts to these software packages to address special requirements; writing software to allow new imaging modalities.

Experience in more than one of these areas is welcome, but not essential.

We have recently shown that laser-based, quantum-coherent manipulation of free electrons can help overcome long-standing problems in cryogenic electron microscopy (cryo-EM). Our Laser Phase Plate (LPP), together with advances in direct electron detectors, will make it possible to extract all information that is present in the electron beam at the standard quantum limit.

Funding has now arrived from the Chan-Zuckerberg Initiative for "Laser Phase Contrast in cryo-EM for Visual Proteomics at Atomic Resolution," to set up a moonshot electron microscope. This instrument will feature a new, dual LPP, a gun monochromator, aberration correction, an energy filter, and the latest direct detection camera, with a goal of near-atomic resolution imaging of the proteome. We are collaborating with Robert Glaser on microscope development;

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Eva Nogales, Jim Hurley, Elisabeth Villa, and David Drubin to try out their most challenging specimens; as well as with ThermoFisher Scientific to transfer the technology. The project is associated with Quantitative Biosciences (QB3) at Berkeley, which brings together physical scientists, engineers, and biologists into a collaborative research environment with shared resources and core research support facilities.

Lab: <http://matterwave.physics.berkeley.edu/>

## QUALIFICATIONS

### Basic qualifications (required at time of application)

Candidates must hold a Ph.D. or equivalent international degree or be in the process of obtaining a Ph.D. or equivalent international degree at the time of application.

### Additional qualifications (required at time of start)

Candidates must have obtained their Ph.D. or equivalent international degree by the start date of the job. Candidates should have no more than three years of previous postdoctoral experience by start date in Spring 2022.

### Preferred qualifications

A Ph.D. in Physics in experimental physics. Biological electron microscopy, or innovative use of software for data collection and analysis in the area of cryo-EM and tomography.

## APPLICATION REQUIREMENTS

### Document requirements

- Curriculum Vitae - Your most recently updated C.V.
- Cover Letter
- Statement of Research
- Publications

### Reference requirements

- 2-3 required (contact information only)

Apply link: <https://aprecruit.berkeley.edu/JPF03273>

Help contact: [cwelden@berkeley.edu](mailto:cwelden@berkeley.edu)

## CAMPUS INFORMATION

Diversity, equity, inclusion, and belonging are core values at UC Berkeley. Our excellence can only be fully realized by faculty, students, and academic and non-academic staff who share our commitment to these values. Successful candidates for our academic positions will demonstrate evidence of a commitment to advancing equity, inclusion, and belonging.

The University of California, Berkeley is an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, or protected veteran status. For the complete University of California nondiscrimination and affirmative action policy see: <http://policy.ucop.edu/doc/4000376/NondiscrimAffirmAct>

In searches when letters of reference are required all letters will be treated as confidential per University of California policy and California state law. Please refer potential referees, including when letters are provided via a third party (i.e., dossier service or career center), to the UC Berkeley statement of confidentiality (<http://apo.berkeley.edu/ucb-confidentiality-policy>) prior to submitting their letter.

As a condition of employment, you will be required to comply with the University of California SARS-CoV-2 (COVID-19) Vaccination Program Policy [https://policy.ucop.edu/doc/5000695/SARS-CoV-2\\_Covid-19](https://policy.ucop.edu/doc/5000695/SARS-CoV-2_Covid-19). All Covered Individuals under the policy must provide proof of Full Vaccination or, if applicable, submit a request for Exception (based on Medical Exemption, Disability, and/or Religious Objection) or Deferral (based on pregnancy) no later than the applicable deadline. For new University of California employees, the applicable deadline is eight weeks after their first date of employment. (Capitalized terms in this paragraph are defined in the policy.)

## JOB LOCATION

Berkeley, CA