Stanford

Peter Dahlberg

Assistant Professor of Photon Science and of Structural Biology

Photon Science Directorate

Curriculum Vitae available Online

Bio

BIO

Peter Dahlberg received his undergraduate degree at McGill University in 2011 and his Ph.D. in biophysics from the University of Chicago in 2016. He then came to Stanford to work with W. E. Moerner and Wah Chiu to develop correlative light and electron microscopy methods. These methods give highly specific information on the machines that fill cells and make them work. In 2021 he was awarded SLAC's Panofsky Fellowship to continue his work on correlative microscopy. In 2023 he transitioned to a Staff Scientist role at SLAC. See the group website below for more information.

ACADEMIC APPOINTMENTS

- Assistant Professor, Photon Science Directorate
- Assistant Professor, Structural Biology
- Member, Bio-X
- Principal Investigator, Stanford PULSE Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- NSF Graduate Research Fellowship, NSF (2012)
- Panofsky Fellowship, SLAC (2021)

PROFESSIONAL EDUCATION

- B.S., McGill University , Physics (2011)
- PhD, University of Chicago , Biophysics (2016)

LINKS

- Dahlberg Lab Website: https://web.slac.stanford.edu/dahlberglab/

Teaching

COURSES

2025-26

- Methods in Molecular Biophysics: BIOPHYS 242, SBIO 242 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Will Dwyer, Emma Magee

Postdoctoral Faculty Sponsor

Christopher Azaldegui, Arundhati Deshmukh, Kevin Rose, Niko Vlahakis

Doctoral Dissertation Advisor (AC)

Gabriel Mintzer, Magda Zaoralova

Doctoral Dissertation Co-Advisor (AC)

Joey Yoniles

Postdoctoral Research Mentor

Arundhati Deshmukh, Niko Vlahakis

Publications

PUBLICATIONS

- **Workflow Using a Cryogenic Coincident Fluorescence, Electron, and Ion Beam Microscope for Targeted Milling of Cells.** *Journal of visualized experiments : JoVE*
  Wang, J., Sica, A. V., Jensen, G. J., Dahlberg, P. D.
  2025
- **Cryogenic electron tomography and fluorescence light microscopy of multispecies communities within the soil microbiome**
  Ansell, T., Berrios, L., Peay, K. G., Dahlberg, P. D.
  CELL PRESS.2025
- **Cryogenic electron tomography and fluorescence light microscopy of multispecies communities within the soil microbiome**
  Ansell, T., Berrios, L., Peay, K. G., Dahlberg, P. D.
  CELL PRESS.2025
- **BPS2025-Tracking and quantification of 3D sample movement during focused ion beam milling**
  Eichinger, T., Antolini, C., Zaoralova, M., Wang, J., Dahlberg, P. D.
  CELL PRESS.2025
- **Standardizing experimental approaches to investigate interactions between bacteria and ectomycorrhizal fungi.** *FEMS microbiology reviews*
  Berrios, L., Ansell, T. B., Dahlberg, P. D., Peay, K. G.
  2024
- **Exploring Transient States of PAmKate to Enable Improved Cryogenic Single-Molecule Imaging.** *Journal of the American Chemical Society*
  Perez, D., Dowlatshahi, D. P., Azaldegui, C. A., Ansell, T. B., Dahlberg, P. D., Moerner, W. E.
  2024
- **Time-resolved cryogenic electron tomography for the study of transient cellular processes.** *Molecular biology of the cell*
  Yoniles, J., Summers, J. A., Zielinski, K. A., Antolini, C., Panjalingam, M., Lisova, S., Moss, F. R., Perna, M. A., Kupitz, C., Hunter, M. S., Pollack, L., Wakatsuki, S., Dahlberg, et al
  2024: mbcE24010042
- **Exploring transient states of PAmKate to enable improved cryogenic single-molecule imaging.** *bioRxiv : the preprint server for biology*
  Perez, D., Dowlatshahi, D. P., Azaldegui, C. A., Dahlberg, P. D., Moerner, W. E.
  2024
- **Revealing the 3D nanoscale organization of MyosinH in the apical complex of toxoplasma gondii through single-molecule localization microscopy with the double-helix point spread function**
  Balaji, A., Zarko, L., Dahlberg, P. D., Boothroyd, J. C., Moerner, W. E.
  CELL PRESS.2024: 30A-31A
- **Environmental biosensors for cryogenic correlative light and electron microscopy**
  Azaldegui, C. A., Rui, Y., Vecchiarelli, A., Dinneny, J., Biteen, J., Dahlberg, P. D.

CELL PRESS.2024: 419A

- **Probing optical effects in fluorescent-guided FIB milling**
  Sica, A. V., Dahlberg, P. D.
  CELL PRESS.2024: 433A
- **Visualizing spatial and temporal responses of plant cells to the environment**
  Zaoralova, M., Azaldegui, C. A., Sica, A. V., Rui, Y., Joubert, L., Dinneny, J., Dahlberg, P. D.
  CELL PRESS.2024: 420A
- **Advanced Cryogenic Light Microscopy Stage to Enable 3D Super-resolved Cryogenic Correlative Light and Electron Microscopy.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Perez, D., Dahlberg, P. D., Moerner, W. E.
  2023; 29 (Supplement_1): 1941
- **Characterization of mApple as a Red Fluorescent Protein for Cryogenic Single-Molecule Imaging with Turn-Off and Turn-On Active Control Mechanisms.** *The journal of physical chemistry. B*
  Sartor, A. M., Dahlberg, P. D., Perez, D., Moerner, W. E.
  2023
- **Ratiometric sensing of redox environments inside individual carboxysomes trapped in solution**
  Carpenter, W. B., Lavania, A. A., Turnsek, J. B., Perez, D., Oltrogge, L. M., Dahlberg, P. D., Savage, D. F., Moerner, W. E.
  CELL PRESS.2023: 304A
- **Metallic Support Films Reduce Optical Heating in Cryogenic Correlative Light and Electron Tomography.** *Journal of structural biology*
  Dahlberg, P. D., Perez, D., Hecksel, C. W., Chiu, W., Moerner, W. E.
  2022: 107901
- **Cryo-electron tomography with mixed-scale dense neural networks reveals key steps in deployment of Toxoplasma invasion machinery.** *PNAS nexus*
  Segev-Zarko, L. A., Dahlberg, P. D., Sun, S. Y., Pelt, D. M., Kim, C. Y., Egan, E. S., Sethian, J. A., Chiu, W., Boothroyd, J. C.
  2022; 1 (4): pgac183
- **Identification and Demonstration of roGFP2 as an Environmental Sensor for Cryogenic Correlative Light and Electron Microscopy.** *Journal of structural biology*
  Perez, D., Dahlberg, P. D., Wang, J., Sartor, A. M., Borden, J. S., Shapiro, L., Moerner, W. E.
  2022: 107881
- **Ratiometric Sensing of Redox Environments Inside Individual Carboxysomes Trapped in Solution.** *The journal of physical chemistry letters*
  Carpenter, W. B., Lavania, A. A., Borden, J. S., Oltrogge, L. M., Perez, D., Dahlberg, P. D., Savage, D. F., Moerner, W. E.
  2022: 4455-4462
- **A bottom-up perspective on photodynamics and photoprotection in light-harvesting complexes using anti-Brownian trapping.** *The Journal of chemical physics*
  Squires, A. H., Wang, Q., Dahlberg, P. D., Moerner, W. E.
  2022; 156 (7): 070901
- **ATP-responsive biomolecular condensates tune bacterial kinase signaling.** *Science advances*
  Saurabh, S., Chong, T. N., Bayas, C., Dahlberg, P. D., Cartwright, H. N., Moerner, W. E., Shapiro, L.
  2022; 8 (7): eabm6570
- **Cryogenic Super-Resolution Fluorescence and Electron Microscopy Correlated at the Nanoscale.** *Annual review of physical chemistry*
  Dahlberg, P. D., Moerner, W. E.
  2021
- **Cryogenic single-molecule fluorescence annotations for electron tomography reveal in situ organization of key proteins in Caulobacter.** *Proceedings of the National Academy of Sciences of the United States of America*
  Dahlberg, P. D., Saurabh, S., Sartor, A. M., Wang, J., Mitchell, P. G., Chiu, W., Shapiro, L., Moerner, W. E.
  2020

- **Cryogenic Superresolution Fluorescence Correlated with Cryogenic Electron Tomography: Combining Specific Labeling and High Resolution**
  Dahlberg, P. D., Saurabh, S., Wang, J., Sartor, A. M., Chiu, W., Shapiro, L., Moerner, W. E.
  CELL PRESS.2020: 20A–21A
- **Robust Modulation of a Bacterial Kinase by Protein Phase Separation**
  Saurabh, S., Chong, T., Bayas, C., Dahlberg, P. D., Moerner, W. E., Shapiro, L.
  CELL PRESS.2020: 203A
- **Cryogenic Correlative Single-Particle Photoluminescence Spectroscopy and Electron Tomography for Investigation of Nanomaterials.** *Angewandte Chemie (International ed. in English)*
  Dahlberg, P. D., Perez, D. n., Su, Z. n., Chiu, W. n., Moerner, W. E.
  2020
- **Interferometric Scattering Enables Fluorescence-Free Electrokinetic Trapping of Single Nanoparticles in Free Solution.** *Nano letters*
  Squires, A. H., Lavania, A. A., Dahlberg, P. D., Moerner, W. E.
  2019
- **Developments in cryogenic single-molecule super-resolution imaging and dynamics of photosynthetic antennas in solution**
  Dahlberg, P.
  AMER CHEMICAL SOC.2019
- **Single-molecule trapping and spectroscopy reveals photophysical heterogeneity of phycobilisomes quenched by Orange Carotenoid Protein.** *Nature communications*
  Squires, A. H., Dahlberg, P. D., Liu, H., Magdaong, N. C., Blankenship, R. E., Moerner, W. E.
  2019; 10 (1): 1172
- **Single-molecule trapping and spectroscopy reveals photophysical heterogeneity of phycobilisomes quenched by Orange Carotenoid Protein** *NATURE COMMUNICATIONS*
  Squires, A. H., Dahlberg, P. D., Liu, H., Magdaong, N. M., Blankenship, R. E., Moerner, W. E.
  2019; 10
- **Orientational Dynamics of Transition Dipoles and Exciton Relaxation in LH2 from Ultrafast Two-Dimensional Anisotropy** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
  Massey, S. C., Ting, P., Yeh, S., Dahlberg, P. D., Sohail, S. H., Allodi, M. A., Martin, E. C., Kais, S., Hunter, C., Engel, G. S.
  2019; 10 (2): 270–77
- **NANOSCALE ELUCIDATION OF THE INVASION APPARATUS OF APICOMPLEXAN PARASITES**
  Segev-Zarko, L., Sun, S. Y., Dahlberg, P. D., Pelt, D., Chen, J., Schmid, M. F., Galaz-Montoya, J., Moerner, W. E., Larabell, C., Sethian, J., Chiu, W., Boothroyd, J.
  AMER SOC TROP MED & HYGIENE.2019: 620
- **Identification of PAmKate as a Red Photoactivatable Fluorescent Protein for Cryogenic Super-Resolution Imaging.** *Journal of the American Chemical Society*
  Dahlberg, P. D., Sartor, A. M., Wang, J., Saurabh, S., Shapiro, L., Moerner, W. E.
  2018; 140 (39): 12310–13
- **Identification of PAmKate as a Red Photoactivatable Fluorescent Protein for Cryogenic Super-Resolution Imaging** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Dahlberg, P. D., Sartor, A. M., Wang, J., Saurabh, S., Shapiro, L., Moerner, W. E.
  2018; 140 (39): 12310-12313
- **Excitations Partition into Two Distinct Populations in Bulk Perovskites** *ADVANCED OPTICAL MATERIALS*
  Wang, L., Brawand, N. P., Voeroes, M., Dahlberg, P. D., Otto, J. P., Williams, N. E., Tiede, D. M., Galli, G., Engel, G. S.
  2018; 6 (5)
- **Mapping the ultrafast flow of harvested solar energy in living photosynthetic cells** *NATURE COMMUNICATIONS*
  Dahlberg, P. D., Ting, P., Massey, S. C., Allodi, M. A., Martin, E. C., Hunter, C., Engel, G. S.
  2017; 8: 988

- **Communication: Broad manifold of excitonic states in light-harvesting complex 1 promotes efficient unidirectional energy transfer in vivo** *JOURNAL OF CHEMICAL PHYSICS*
  Sohail, S. H., Dahlberg, P. D., Allodi, M. A., Massey, S. C., Ting, P., Martin, E. C., Hunter, C., Engel, G. S.
  2017; 147 (13): 131101

- **Charge Separation Related to Photocatalytic H-2 Production from a Ru-Apoflavodoxin-Ni Biohybrid** *ACS ENERGY LETTERS*
  Soltau, S. R., Niklas, J., Dahlberg, P. D., Mulfort, K. L., Poluektov, O. G., Utschig, L. M.
  2017; 2 (1): 230-237

- **Optical Resonance Imaging: An Optical Analog to MRI with Subdiffraction-Limited Capabilities** *ACS PHOTONICS*
  Allodi, M. A., Dahlberg, P. D., Mazuski, R. J., Davis, H. C., Otto, J. P., Engel, G. S.
  2016; 3 (12): 2445-2452

- **A simple approach to spectrally resolved fluorescence and bright field microscopy over select regions of interest**
  Dahlberg, P. D., Boughter, C. T., Faruk, N. F., Hong, L., Koh, Y., Reyer, M. A., Shaiber, A., Sherani, A., Zhang, J., Jureller, J. E., Hammond, A. T.
  AMER INST PHYSICS.2016: 113704

- **Electronic Structure and Dynamics of Higher-Lying Excited States in Light Harvesting Complex 1 from Rhodobacter sphaeroides** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Dahlberg, P. D., Ting, P., Massey, S. C., Martin, E. C., Hunter, C., Engel, G. S.
  2016; 120 (24): 4124–30

- **Mutations to R. sphaeroides Reaction Center Perturb Energy Levels and Vibronic Coupling but Not Observed Energy Transfer Rates** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Flanagan, M. L., Long, P. D., Dahlberg, P. D., Rolczynski, B. S., Massey, S. C., Engel, G. S.
  2016; 120 (9): 1479–87

- **Netrin-1-Regulated Distribution of UNC5B and DCC in Live Cells Revealed by TICCS** *BIOPHYSICAL JOURNAL*
  Gopal, A. A., Rappaz, B., Rouger, V., Martyn, I. B., Dahlberg, P. D., Meland, R. J., Beamishd, I. V., Kennedy, T. E., Wisemant, P. W.
  2016; 110 (3): 623–34

- **Electronic and nuclear contributions to time-resolved optical and X-ray absorption spectra of hematite and insights into photoelectrochemical performance** *Energy & Environmental Science*
  Hayes, D., Hadt, R. G., Emery, J. D., Cordones, A. A., Martinson, A. B. F., Shelby, M. L., Fransted, K. A., Dahlberg, P. D., Hong, J., Zhang, X., Kong, Q., Schoenlein, R. W., Chen, et al
  2016; 9 (12): 3754–69

- **Ru-protein-Co biohybrids designed for solar hydrogen production: understanding electron transfer pathways related to photocatalytic function** *CHEMICAL SCIENCE*
  Soltau, S. R., Dahlberg, P. D., Niklas, J., Poluektov, O. G., Mulfort, K. L., Utschig, L. M.
  2016; 7 (12): 7068–78

- **Red, Yellow, Green, and Blue Amplified Spontaneous Emission and Lasing Using Colloidal CdSe Nanoplatelets** *ACS NANO*
  She, C., Fedin, I., Dolzhnikov, D. S., Dahlberg, P. D., Engel, G. S., Schaller, R. D., Talapin, D. V.
  2015; 9 (10): 9475–85

- **Communication: Coherences observed in vivo in photosynthetic bacteria using two-dimensional electronic spectroscopy** *JOURNAL OF CHEMICAL PHYSICS*
  Dahlberg, P. D., Norris, G. J., Wang, C., Viswanathan, S., Singh, V. P., Engel, G. S.
  2015; 143 (10): 101101

- **Towards quantification of vibronic coupling in photosynthetic antenna complexes** *JOURNAL OF CHEMICAL PHYSICS*
  Singh, V. P., Westberg, M., Wang, C., Dahlberg, P. D., Gellen, T., Gardiner, A. T., Cogdell, R. J., Engel, G. S.
  2015; 142 (21): 212446

- **Aqueous light driven hydrogen production by a Ru-ferredoxin-Co biohybrid** *CHEMICAL COMMUNICATIONS*
  Soltau, S. R., Niklas, J., Dahlberg, P. D., Poluektov, O. G., Tiede, D. M., Mulfort, K. L., Utschig, L. M.
  2015; 51 (53): 10628–31

- **Dispersion-free continuum two-dimensional electronic spectrometer** *APPLIED OPTICS*
  Zheng, H., Caram, J. R., Dahlberg, P. D., Rolczynski, B. S., Viswanathan, S., Dolzhnikov, D. S., Khadivi, A., Talapin, D. V., Engel, G. S.

2014; 53 (9): 1909–17

- **Exploring size and state dynamics in CdSe quantum dots using two-dimensional electronic spectroscopy** *JOURNAL OF CHEMICAL PHYSICS*
  Caram, J. R., Zheng, H., Dahlberg, P. D., Rolczynski, B. S., Griffin, G. B., Dolzhnikov, D. S., Talapin, D. V., Engel, G. S.
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- **Dynamic localization of electronic excitation in photosynthetic complexes revealed with chiral two-dimensional spectroscopy** *NATURE COMMUNICATIONS*
  Fidler, A. F., Singh, V. P., Long, P. D., Dahlberg, P. D., Engel, G. S.
  2014; 5: 3286
- **Persistent Interexcitonic Quantum Coherence in CdSe Quantum Dots** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
  Caram, J. R., Zheng, H., Dahlberg, P. D., Rolczynski, B. S., Griffin, G. B., Fidler, A. F., Dolzhnikov, D. S., Talapin, D. V., Engel, G. S.
  2014; 5 (1): 196–204
- **Energy Transfer Observed in Live Cells Using Two-Dimensional Electronic Spectroscopy** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
  Dahlberg, P. D., Fidler, A. F., Caram, J. R., Long, P. D., Engel, G. S.
  2013; 4 (21): 3636–40
- **Probing energy transfer events in the light harvesting complex 2 (LH2) of Rhodobacter sphaeroides with two-dimensional spectroscopy** *JOURNAL OF CHEMICAL PHYSICS*
  Fidler, A. F., Singh, V. P., Long, P. D., Dahlberg, P. D., Engel, G. S.
  2013; 139 (15): 155101
- **Time Scales of Coherent Dynamics in the Light-Harvesting Complex 2 (LH2) of Rhodobacter sphaeroides** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
  Fidler, A. F., Singh, V. P., Long, P. D., Dahlberg, P. D., Engel, G. S.
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