



Mathew Britton

Staff Scientist, SLAC National Accelerator Laboratory

Bio

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My experience and interests relate to ultrafast optics and AMO physics. My Ph.D. explored nonlinear laser interactions at the intersection of isolated molecules and dense media by investigating the controversial dynamics of nitrogen molecular ions during laser filamentation in air. My postdoctoral work utilized few-cycle pulse pairs to study and control the fast dynamics of water in strong fields using photofragment ion imaging. At LCLS, I am particularly interested in the development and deployment of hardware and algorithms for robust diagnostics that will push the boundaries of optical + X-ray pump-probe science.

CURRENT ROLE AT STANFORD

Staff Scientist, Laser Methods & Metrology Group, Laser Science Department, Linac Coherent Light Source

EDUCATION AND CERTIFICATIONS

- Postdoc., Stanford University, Stanford, California, USA
- Ph.D., University of Ottawa, Ottawa, Ontario, Canada , Physics (2020)
- B.Sc. Hons., Dalhousie University, Halifax, Nova Scotia, Canada , Physics (2013)

Publications

PUBLICATIONS

- **Distinguishing the XUV-induced Coulomb explosion dynamics of iodobenzene using covariance analysis** *JOURNAL OF PHYSICS B- ATOMIC MOLECULAR AND OPTICAL PHYSICS*
Walmsley, T., Allum, F., Harries, J. R., Kumagai, Y., Lim, S., McManus, J., Nagaya, K., Britton, M., Brouard, M., Bucksbaum, P., Fushitani, M., Gabalski, I., Gejo, et al
2024; 57 (23)
- **Time-Resolved Probing of the Iodobenzene C-Band Using XUV-Induced Electron Transfer Dynamics.** *ACS physical chemistry Au*
Unwin, J., Razmus, W. O., Allum, F., Harries, J. R., Kumagai, Y., Nagaya, K., Britton, M., Brouard, M., Bucksbaum, P., Fushitani, M., Gabalski, I., Gejo, T., Hockett, et al
2024; 4 (6): 620-631
- **Carrier-envelope phase-stabilized ultrashort pulses from a gas-filled multi-pass cell** *APPLIED PHYSICS LETTERS*
Khatri, D., Truong, T., Lantigua, C., Kincaid, C., Britton, M., Chini, M.
2024; 125 (9)
- **Time-Resolved Probing of the Iodobenzene C-Band Using XUV-Induced Electron Transfer Dynamics** *ACS PHYSICAL CHEMISTRY AU*
Unwin, J., Razmus, W. O., Allum, F., Harries, J. R., Kumagai, Y., Nagaya, K., Britton, M., Brouard, M., Bucksbaum, P., Fushitani, M., Gabalski, I., Gejo, T., Hockett, et al
2024

- **The Role of Momentum Partitioning in Covariance Ion Imaging Analysis** *JOURNAL OF PHYSICAL CHEMISTRY A*
Walmsley, T., McManus, J. W., Kumagai, Y., Nagaya, K., Harries, J., Iwayama, H., Ashfold, M. N. R., Britton, M., Bucksbaum, P. H., Downes-Ward, B., Driver, T., Heathcote, D., Hockett, et al
2024
- **Exploring the ultrafast and isomer-dependent photodissociation of iodothiophenes via site-selective ionization.** *Physical chemistry chemical physics : PCCP*
Razmus, W. O., Allum, F., Harries, J., Kumagai, Y., Nagaya, K., Bhattacharyya, S., Britton, M., Brouard, M., Bucksbaum, P. H., Cheung, K., Crane, S. W., Fushitani, M., Gabalski, et al
2024
- **Direct momentum imaging of charge transfer following site-selective ionization** *PHYSICAL REVIEW A*
Allum, F., Kumagai, Y., Nagaya, K., Harries, J., Iwayama, H., Britton, M., Bucksbaum, P. H., Burt, M., Brouard, M., Downes-Ward, B., Driver, T., Heathcote, D., Hockett, et al
2023; 108 (4)
- **X-ray induced Coulomb explosion imaging of transient excited-state structural rearrangements in CS₂** *COMMUNICATIONS PHYSICS*
Unwin, J., Allum, F., Britton, M., Gabalski, I., Bromberger, H., Brouard, M., Bucksbaum, P. H., Driver, T., Ekanayake, N., Garg, D., Gougoula, E., Heathcote, D., Howard, et al
2023; 6 (1)
- **Femtosecond Electronic and Hydrogen Structural Dynamics in Ammonia Imaged with Ultrafast Electron Diffraction.** *Physical review letters*
Champenois, E. G., List, N. H., Ware, M., Britton, M., Bucksbaum, P. H., Cheng, X., Centurion, M., Cryan, J. P., Forbes, R., Gabalski, I., Hegazy, K., Hoffmann, M. C., Howard, et al
2023; 131 (14): 143001
- **Time-Resolved X-ray Photoelectron Spectroscopy: Ultrafast Dynamics in CS₂ Probed at the S 2p Edge.** *The journal of physical chemistry letters*
Gabalski, I., Allum, F., Seidu, I., Britton, M., Brenner, G., Bromberger, H., Brouard, M., Bucksbaum, P. H., Burt, M., Cryan, J. P., Driver, T., Ekanayake, N., Erk, et al
2023: 7126-7133
- **Filming enhanced ionization in an ultrafast triatomic slingshot.** *Communications chemistry*
Howard, A. J., Britton, M., Streeter, Z. L., Cheng, C., Forbes, R., Reynolds, J. L., Allum, F., McCracken, G. A., Gabalski, I., Lucchese, R. R., McCurdy, C. W., Weinacht, T., Bucksbaum, et al
2023; 6 (1): 81
- **Disentangling sequential and concerted fragmentations of molecular polycations with covariant native frame analysis.** *Physical chemistry chemical physics : PCCP*
McManus, J. W., Walmsley, T., Nagaya, K., Harries, J. R., Kumagai, Y., Iwayama, H., Ashfold, M. N., Britton, M., Bucksbaum, P. H., Downes-Ward, B., Driver, T., Heathcote, D., Hockett, et al
2022
- **Coherent control of ultrafast extreme ultraviolet transient absorption** *NATURE PHOTONICS*
Peng, P., Mi, Y., Lytova, M., Britton, M., Ding, X., Naumov, A., Corkum, P. B., Villeneuve, D. M.
2022; 16 (1): 45-+
- **Control of N₂⁺ air lasing** *PHYSICAL REVIEW A*
Britton, M., Lytova, M., Ko, D., Alqasem, A., Peng, P., Villeneuve, D. M., Zhang, C., Arissian, L., Corkum, P. B.
2020; 102 (5)
- **Short- and long-term gain dynamics in N₂⁺ air lasing** *PHYSICAL REVIEW A*
Britton, M., Lytova, M., Laferriere, P., Peng, P., Morales, F., Ko, D., Richter, M., Polynkin, P., Villeneuve, D. M., Zhang, C., Ivanov, M., Spanner, M., Arissian, et al
2019; 100 (1)
- **Testing the Role of Recollision in N₂⁺ Air Lasing.** *Physical review letters*
Britton, M., Laferrière, P., Ko, D. H., Li, Z., Kong, F., Brown, G., Naumov, A., Zhang, C., Arissian, L., Corkum, P. B.
2018; 120 (13): 133208

- **Energy-selective optical excitation and detection in InAs/InP quantum dot ensembles using a one-dimensional optical microcavity** *APPLIED PHYSICS LETTERS*

Gamouras, A., Britton, M., Khairy, M. M., Mathew, R., Dalacu, D., Poole, P., Poitras, D., Williams, R. L., Hall, K. C.
2013; 103 (25)