

Stanford



Felix Allum

Postdoctoral Scholar, Photon Science, SLAC

Bio

BIO

I am a Postdoctoral Scholar affiliated with the PULSE institute and the LCLS Laser Science Division. My research interests focus on the ultrafast photodynamics of isolated molecules in the gas phase, as studied by a range of techniques typically incorporating charged particle imaging, photoionization spectroscopy or diffractive imaging. I am also interested in developing new approaches to studying ultrafast photochemistry, through, for instance, the generation of broad bandwidth optical pulses and new data analysis techniques to extract additional information from rich and complex datasets.

Prior to joining SLAC in October 2021, I studied for my PhD at the University of Oxford under the supervision of Mark Brouard. My doctoral research included a range of studies into ultrafast photodissociation dynamics using velocity-map imaging, both in a laboratory setting and at international FEL facilities.

STANFORD ADVISORS

- Philip Bucksbaum, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **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
- **Multiparticle Cumulant Mapping for Coulomb Explosion Imaging.** *Physical review letters*
Cheng, C., Frasiniski, L. J., Mo#ol, G., Allum, F., Howard, A. J., Rolles, D., Bucksbaum, P. H., Brouard, M., Forbes, R., Weinacht, T.
2023; 130 (9): 093001
- **Photon energy-resolved velocity map imaging from spectral domain ghost imaging** *NEW JOURNAL OF PHYSICS*
Wang, J., Driver, T., Allum, F., Papadopoulou, C. C., Passow, C., Brenner, G., Li, S., Duesterer, S., Tul Noor, A., Kumar, S., Bucksbaum, P. H., Erk, B., Forbes, et al
2023; 25 (3)
- **Photoionization and Photofragmentation Dynamics of I₂ in Intense Laser Fields: A Velocity-Map Imaging Study** *JOURNAL OF PHYSICAL CHEMISTRY A*
Allum, F., McManus, J., Denby, O., Burt, M., Brouard, M.
2022: 8577-8587
- **Transient vibration and product formation of photoexcited CS₂ measured by time-resolved x-ray scattering.** *The Journal of chemical physics*
Gabalski, I., Sere, M., Acheson, K., Allum, F., Boutet, S., Dixit, G., Forbes, R., Glowonia, J. M., Goff, N., Hegazy, K., Howard, A. J., Liang, M., Miniti, et al
2022; 157 (16): 164305

- **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
- **The kinetic energy of PAH dication and trication dissociation determined by recoil-frame covariance map imaging.** *Physical chemistry chemical physics : PCCP*
Lee, J. W., Tikhonov, D. S., Allum, F., Boll, R., Chopra, P., Erk, B., Gruet, S., He, L., Heathcote, D., Kazemi, M. M., Lahl, J., Lemmens, A. K., Loru, et al
2022
- **Fragmentation Dynamics of Fluorene Explored Using Ultrafast XUV-Vis Pump-Probe Spectroscopy** *FRONTIERS IN PHYSICS*
Garg, D., Lee, J. L., Tikhonov, D. S., Chopra, P., Steber, A. L., Lemmens, A. K., Erk, B., Allum, F., Boll, R., Cheng, X., Duesterer, S., Gruet, S., He, et al
2022; 10
- **A localized view on molecular dissociation via electron-ion partial covariance** *COMMUNICATIONS CHEMISTRY*
Allum, F., Music, V., Inhester, L., Boll, R., Erk, B., Schmidt, P., Baumann, T. M., Brenner, G., Burt, M., Demekhin, P., Doerner, S., Ehresmann, A., Galler, et al
2022; 5 (1)
- **UV-induced dissociation of CH₂BrI probed by intense femtosecond XUV pulses** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*
Kockert, H., Lee, J. L., Allum, F., Amini, K., Bari, S., Bomme, C., Brausse, F., Brouard, M., Burt, M., de Miranda, B., Duesterer, S., Eng-Johnsson, P., Erk, et al
2022; 55 (1)
- **Time-resolved relaxation and fragmentation of polycyclic aromatic hydrocarbons investigated in the ultrafast XUV-IR regime** *NATURE COMMUNICATIONS*
Lee, J. L., Tikhonov, D. S., Chopra, P., Maclot, S., Steber, A. L., Gruet, S., Allum, F., Boll, R., Cheng, X., Duesterer, S., Erk, B., Garg, D., He, et al
2021; 12 (1): 6107
- **Multi-Particle Three-Dimensional Covariance Imaging: "Coincidence" Insights into the Many-Body Fragmentation of Strong-Field Ionized D₂O.** *The journal of physical chemistry letters*
Allum, F., Cheng, C., Howard, A. J., Bucksbaum, P. H., Brouard, M., Weinacht, T., Forbes, R.
2021: 8302-8308
- **Multi-channel photodissociation and XUV-induced charge transfer dynamics in strong-field-ionized methyl iodide studied with time-resolved recoil-frame covariance imaging.** *Faraday discussions*
Allum, F., Anders, N., Brouard, M., Bucksbaum, P., Burt, M., Downes-Ward, B., Grundmann, S., Harries, J., Ishimura, Y., Iwayama, H., Kaiser, L., Kukk, E., Lee, et al
2021
- **Time-resolved site-selective imaging of predissociation and charge transfer dynamics: the CH₃I B-band** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*
Forbes, R., Allum, F., Bari, S., Boll, R., Borne, K., Brouard, M., Bucksbaum, P. H., Ekanayake, N., Erk, B., Howard, A. J., Johnsson, P., Lee, J. L., Manschwetus, et al
2020; 53 (22)
- **Post extraction inversion slice imaging for 3D velocity map imaging experiments** *MOLECULAR PHYSICS*
Allum, F., Mason, R., Burt, M., Slater, C. S., Squires, E., Winter, B., Brouard, M.
2021; 119 (1-2)
- **Coulomb explosion imaging of CH₃I and CH₂Cl₂ photodissociation dynamics** *JOURNAL OF CHEMICAL PHYSICS*
Allum, F., Burt, M., Amini, K., Boll, R., Kockert, H., Olshin, P. K., Bari, S., Bomme, C., Brausse, F., de Miranda, B., Duesterer, S., Erk, B., Geleoc, et al
2018; 149 (20): 204313