

Stanford



Yusong Liu

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Bio

BIO

I am currently an associate staff scientist in SLAC LCLS SRD Chemical Science Department. My research interest falls in excited state dynamics of small organic molecules, and I am particularly interested in using novel experimental techniques probing the ongoing dynamics in real time and space. The excited state dynamics in these systems usually take place in attoseconds to picoseconds time scales. The strongly-coupled electronic and nuclear dynamics often result in ultrafast energy redistribution as well as structure transformation, and facilitate many phenomenons in physics, chemistry, and biology.

My research builds on my extensive experience with ultrafast optical laser science and technology and time resolved spectroscopies. I am currently focusing on developing experiments utilizing multiple time-resolved spectroscopy or diffraction techniques probing molecular dynamics. These included time-resolved valence-ionization spectroscopy, Soft X-ray core-ionization spectroscopy, and ultrafast electron and hard X-ray diffraction. Most of my experiments are built upon the LCLS FEL X-ray beamline, MeV-UED facility in SLAC national lab, and our own tabletop ultrafast laser lab in Stanford PULSE institute.

EDUCATION AND CERTIFICATIONS

- PhD, Stony Brook University , Physical Chemistry (2021)
- B.S., Ocean University of China , Optical Information (2013)

LINKS

- Google Scholar: <https://scholar.google.com/citations?hl=en&tzom=420&user=0UAChswAAAAJ>

Publications

PUBLICATIONS

- **Ultrafast Events in Electrocyclic Ring-Opening Reactions.** *Annual review of physical chemistry*
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- **Rehybridization dynamics into the pericyclic minimum of an electrocyclic reaction imaged in real-time.** *Nature communications*
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- **Spectroscopic and Structural Probing of Excited-State Molecular Dynamics with Time-Resolved Photoelectron Spectroscopy and Ultrafast Electron Diffraction** *PHYSICAL REVIEW X*

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- **Ultrafast structural dynamics of UV photoexcited cis,cis-1,3-cyclooctadiene observed with time-resolved electron diffraction.** *Physical chemistry chemical physics : PCCP*
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 - **Design and performance of a magnetic bottle electron spectrometer for high-energy photoelectron spectroscopy.** *The Review of scientific instruments*
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 - **Compact single-shot soft X-ray photon spectrometer for free-electron laser diagnostics** *OPTICS EXPRESS*
Larsen, K. A., Borne, K., Obaid, R., Kamalov, A., Liu, Y., Cheng, X., James, J., Driver, T., Li, K., Liu, Y., Sakdinawat, A., David, C., Wolf, et al
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 - **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
 - **Nonadiabatic Excited State Dynamics of Organic Chromophores: Take-Home Messages.** *The journal of physical chemistry. A*
Chakraborty, P., Liu, Y., McClung, S., Weinacht, T., Matsika, S.
2022
 - **Multichannel photodissociation dynamics in CS₂ studied by ultrafast electron diffraction.** *Physical chemistry chemical physics : PCCP*
Razmus, W. O., Acheson, K., Bucksbaum, P., Centurion, M., Champenois, E., Gabalski, I., Hoffman, M. C., Howard, A., Lin, M., Liu, Y., Nunes, P., Saha, S., Shen, et al
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 - **Time Resolved Photoelectron Spectroscopy as a Test of Electronic Structure and Nonadiabatic Dynamics** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
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 - **Excited state dynamics of cis,cis-1,3-cyclooctadiene: UV pump VUV probe time-resolved photoelectron spectroscopy** *JOURNAL OF CHEMICAL PHYSICS*
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 - **Excited state dynamics of cis,cis-1,3-cyclooctadiene: Non-adiabatic trajectory surface hopping** *JOURNAL OF CHEMICAL PHYSICS*
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2018; 89 (10): 103115
- **Vibrationally assisted below-threshold ionization** *PHYSICAL REVIEW A*
Horton, S. L., Liu, Y., Chakraborty, P., Matsika, S., Weinacht, T.
2017; 95 (6)
- **Ultrafast internal conversion dynamics of highly excited pyrrole studied with VUV/UV pump probe spectroscopy** *JOURNAL OF CHEMICAL PHYSICS*
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