



## Adi Natan

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### Bio

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#### BIO

Dr Natan leads the Non-Periodic ultrafast X-ray Imaging group at the Stanford PULSE Institute, where the research focuses on imaging ultrafast atomic motion in systems that interact with complex fields and environments, mostly using ultrafast X-ray FEL pulses. The purpose of this research is to study light-matter interaction in the shortest length and timescales, to uncover the interplay between correlated electronic motion and relaxation, nuclear motion, and photo-absorption processes. The research team develops experimental and computational tools to image quantum dynamics at the atomic scale, with the aim to overcome the limits of current approaches that rely on modeling and simulation. The research also leverages recent advances in ultrafast x-ray lasers, like the LCLS at SLAC National Accelerator Laboratory, and helps develop effective protocols, new modalities, detection schemes, and demonstrates important new capabilities as soon as they become feasible. In addition, Dr Natan is the co-PI of the Strong Field AMO physics task at PULSE, where he studies strong-field light-matter interaction in atoms and molecules, in particular, light-induced conical intersections, imaging strong-field ionization dynamics, and attosecond electronic delays.

Dr Natan received his PhD in Physics from the Weizmann Institute of Science, where he worked with Prof. Yaron Silberberg on coherent control, strong field interaction, nonlinear spectroscopy, and quantum optics. He was later a postdoctoral fellow at PULSE under the supervision of Prof. Phil Bucksbaum working on strong field AMO physics, and ultrafast X-ray science.

### Publications

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#### PUBLICATIONS

- **Disentangling the subcycle electron momentum spectrum in strong-field ionization** *PHYSICAL REVIEW RESEARCH*  
Werby, N., Natan, A., Forbes, R., Bucksbaum, P. H.  
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- **Resolving multiphoton processes with high-order anisotropy ultrafast X-ray scattering.** *Faraday discussions*  
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- **Attosecond transient absorption spooktroscopy: a ghost imaging approach to ultrafast absorption spectroscopy.** *Physical chemistry chemical physics : PCCP*  
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2019
- **On the limits of observing motion in time-resolved X-ray scattering** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*  
Ware, M. R., Glowonia, J. M., Natan, A., Cryan, J. P., Bucksbaum, P. H.  
2019; 377 (2145)
- **On the limits of observing motion in time-resolved X-ray scattering.** *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences*  
Ware, M. R., Glowonia, J. M., Natan, A., Cryan, J. P., Bucksbaum, P. H.  
2019; 377 (2145): 20170477
- **Generation and Characterization of Attosecond Pulses from an X-ray Free-electron Laser**  
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- **Characterizing isolated attosecond pulses with angular streaking** *OPTICS EXPRESS*  
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2018; 26 (4): 4531–47
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- **Observation of Quantum Interferences via Light-Induced Conical Intersections in Diatomic Molecules** *PHYSICAL REVIEW LETTERS*  
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- **Observing the Uncoupling of Electron Motion from the Molecular Frame in Photoelectron Angular Distributions**  
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- **Strongly aligned gas-phase molecules at free-electron lasers** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*  
Kierspel, T., Wiese, J., Mullins, T., Robinson, J., Aquila, A., Barty, A., Bean, R., Boll, R., Boutet, S., Bucksbaum, P., Chapman, H. N., Christensen, L., Fry, et al  
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- **Ultrafast isomerization initiated by X-ray core ionization.** *Nature communications*  
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- **Experimental Observation of Light Induced Conical Intersections in a Diatomic Molecule**  
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