

# Stanford

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## Jerome Hastings

Professor (Research) of Photon Science, Emeritus  
Photon Science Directorate

### Bio

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#### ACADEMIC APPOINTMENTS

- Professor Emeritus, Photon Science Directorate
- Principal Investigator, Stanford PULSE Institute

### Teaching

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#### COURSES

##### 2025-26

- Principles of X-ray Scattering: APPPHYS 222 (Spr)
- Synchrotron Radiation and Free Electron Lasers: Principles and Applications.: APPPHYS 325 (Spr)

##### 2024-25

- Advanced Topics in X-ray Scattering: APPPHYS 322 (Spr)
- Principles of X-ray Scattering: APPPHYS 222, PHOTON 222 (Win)

##### 2023-24

- Principles of X-ray Scattering: APPPHYS 222, PHOTON 222 (Win)

#### STANFORD ADVISEES

##### Doctoral Dissertation Reader (AC)

Arijit Majumdar, Madison Singleton

##### Doctoral Dissertation Advisor (AC)

Catherine Weibel

### Publications

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#### PUBLICATIONS

- **X-ray diffraction of metastable structures from supercooled liquid hydrogen.** *Scientific reports*  
Fletcher, L. B., Levitan, A. L., McBride, E. E., Kim, J. B., Alves, E. P., Aquila, A., Frost, M., Goede, S., King, G., Lane, T. J., Liang, M., MacDonald, M. J., Ofori-Okai, et al  
2024; 14 (1): 17283
- **Evidence for phonon hardening in laser-excited gold using x-ray diffraction at a hard x-ray free electron laser.** *Science advances*  
Descamps, A., Ofori-Okai, B. K., Bistoni, O., Chen, Z., Cunningham, E., Fletcher, L. B., Hartley, N. J., Hastings, J. B., Khaghani, D., Mo, M., Nagler, B., Recoules, V., Redmer, et al  
2024; 10 (6): eadh5272

- **Femtosecond electronic structure response to high intensity XFEL pulses probed by iron X-ray emission spectroscopy.** *Scientific reports*  
Alonso-Mori, R. n., Sokaras, D. n., Cammarata, M. n., Ding, Y. n., Feng, Y. n., Fritz, D. n., Gaffney, K. J., Hastings, J. n., Kao, C. C., Lemke, H. T., Maxwell, T. n., Robert, A. n., Schropp, et al  
2020; 10 (1): 16837
- **Compact hard x-ray split-delay system based on variable-gap channel-cut crystals** *OPTICS LETTERS*  
Sun, Y., Wang, N., Song, S., Sun, P., Chollet, M., Sato, T., van Driel, T. B., Nelson, S., Plumley, R., Montana-Lopez, J., Teitelbaum, S. W., Haber, J., Hastings, et al  
2019; 44 (10): 2582–85
- **Higher-order modes at FELs: a machine interpretation**  
Sun, P., Sun, Y., Zhu, D., Song, S., Li, H., Chollet, M., Seaberg, M., Hastings, J. B., Robert, A., Sutton, M., Feng, Y.  
edited by Tschentscher, T., Patthey, L., Tiedtke, K., Zangrando, M.  
SPIE-INT SOC OPTICAL ENGINEERING.2019
- **Characterization of defect clusters in ion-irradiated tungsten by X-Ray diffuse scattering** *JOURNAL OF NUCLEAR MATERIALS*  
Sun, P., Wang, Y., Frost, M., Schoenwaelder, C., Levitan, A. L., Mo, M., Chen, Z., Hastings, J. B., Tynan, G. R., Glenzer, S. H., Heimann, P.  
2018; 510: 322–30
- **Nonsequential two-photon absorption from the K shell in solid zirconium** *PHYSICAL REVIEW A*  
Ghimire, S., Fuchs, M., Hastings, J., Herrmann, S. C., Inubushi, Y., Pines, J., Shwartz, S., Yabashi, M., Reis, D. A.  
2016; 94 (4)
- **The phase-contrast imaging instrument at the matter in extreme conditions endstation at LCLS** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Nagler, B., Schropp, A., Galtier, E. C., Arnold, B., Brown, S. B., Fry, A., Gleason, A., Granados, E., Hashim, A., Hastings, J. B., Samberg, D., Seiboth, F., Tavella, et al  
2016; 87 (10)
- **Femtosecond photodissociation dynamics of 1,4-diiodobenzene by gas-phase X-ray scattering and photoelectron spectroscopy.** *Faraday discussions*  
Stankus, B., Budarz, J. M., Kirrander, A., Rogers, D., Robinson, J., Lane, T. J., Ratner, D., Hastings, J., Minitti, M. P., Weber, P. M.  
2016: -?
- **Anomalous nonlinear X-ray Compton scattering** *NATURE PHYSICS*  
Fuchs, M., Trigo, M., Chen, J., Ghimire, S., Shwartz, S., Kozina, M., Jiang, M., Henighan, T., Bray, C., Ndabashimiye, G., Bucksbaum, P. H., Feng, Y., Herrmann, et al  
2015; 11 (11): 964-970
- **The linac coherent light source single particle imaging road map** *STRUCTURAL DYNAMICS*  
Aquila, A., Barty, A., Bostedt, C., Boutet, S., Carini, G., Deponte, D., DRELL, P., Doniach, S., Downing, K. H., Earnest, T., Elmlund, H., Elser, V., Guehr, et al  
2015; 2 (4)
- **Imaging Molecular Motion: Femtosecond X-Ray Scattering of an Electrocyclic Chemical Reaction** *PHYSICAL REVIEW LETTERS*  
Minitti, M. P., Budarz, J. M., Kirrander, A., ROBINSON, J. S., Ratner, D., Lane, T. J., Zhu, D., Glowina, J. M., Kozina, M., Lemke, H. T., Sikorski, M., Feng, Y., Nelson, et al  
2015; 114 (25)
- **Ultrabright X-ray laser scattering for dynamic warm dense matter physics** *NATURE PHOTONICS*  
Fletcher, L. B., Lee, H. J., Doeppner, T., Galtier, E., Nagler, B., Heimann, P., FORTMANN, C., Lepape, S., Ma, T., Millot, M., Pak, A., Turnbull, D., Chapman, et al  
2015; 9 (4): 274-279
- **Demonstration of Single-Crystal Self-Seeded Two-Color X-Ray Free-Electron Lasers** *PHYSICAL REVIEW LETTERS*  
Lutman, A. A., Decker, F., ARTHUR, J., Chollet, M., Feng, Y., Hastings, J., Huang, Z., Lemke, H., Nuhn, H., Marinelli, A., Turner, J. L., Wakatsuki, S., Welch, et al  
2014; 113 (25)
- **New experimental platform to study high density laser-compressed matter** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Gauthier, M., Fletcher, L. B., Ravasio, A., Galtier, E., Gamboa, E. J., Granados, E., Hastings, J. B., Heimann, P., Lee, H. J., Nagler, B., Schropp, A., Gleason, A., Doeppner, et al

2014; 85 (11)

● **X-Ray Second Harmonic Generation** *PHYSICAL REVIEW LETTERS*

Shwartz, S., Fuchs, M., Hastings, J. B., Inubushi, Y., Ishikawa, T., Katayama, T., Reis, D. A., Sato, T., Tono, K., Yabashi, M., Yudovich, S., Harris, S. E.

2014; 112 (16)

● **Toward structural femtosecond chemical dynamics: imaging chemistry in space and time** *FARADAY DISCUSSIONS*

Minitti, M. P., Budarz, J. M., Kirrander, A., Robinson, J., Lane, T. J., Ratner, D., Saita, K., Northey, T., Stankus, B., Cofer-Shabica, V., Hastings, J., Weber, P. M.

2014; 171: 81-91

● **Dovetailing biology and chemistry: integrating the Gene Ontology with the ChEBI chemical ontology** *BMC GENOMICS*

Hill, D. P., Adams, N., Bada, M., Batchelor, C., Berardini, T. Z., Dietze, H., Drabkin, H. J., Ennis, M., Foulger, R. E., Harris, M. A., Hastings, J., Kale, N. S., de Matos, et al

2013; 14

● **Recent development of thin diamond crystals for X-ray FEL beam-sharing** *Conference on Advances in X-ray Free-Electron Lasers II - Instrumentation*

Feng, Y., Alonso-Mori, R., Blank, V., Boutet, S., Chollet, M., van Driel, T. B., Fritz, D. M., Glowonia, J. M., Hastings, J. B., Lemke, H., Messerschmidt, M., Montanez, P. A., Robert, et al

SPIE-INT SOC OPTICAL ENGINEERING.2013

● **Demonstration of self-seeding in a hard-X-ray free-electron laser** *NATURE PHOTONICS*

Amann, J., Berg, W., Blank, V., Decker, F., Ding, Y., Emma, P., Feng, Y., Frisch, J., Fritz, D., Hastings, J., Huang, Z., Krzywinski, J., Lindberg, et al

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● **X-ray and optical wave mixing** *NATURE*

Glover, T. E., Fritz, D. M., Cammarata, M., Allison, T. K., Coh, S., Feldkamp, J. M., Lemke, H., Zhu, D., Feng, Y., Coffee, R. N., Fuchs, M., Ghimire, S., Chen, et al

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● **A single-shot transmissive spectrometer for hard x-ray free electron lasers** *APPLIED PHYSICS LETTERS*

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2012; 101 (3)

● **X-Ray Parametric Down-Conversion in the Langevin Regime** *PHYSICAL REVIEW LETTERS*

Shwartz, S., Coffee, R. N., Feldkamp, J. M., Feng, Y., Hastings, J. B., Yin, G. Y., Harris, S. E.

2012; 109 (1)

● **A hard X-ray transmissive single-shot spectrometer for FEL sources** *Conference on X-Ray Free-Electron Lasers - Beam Diagnostics, Beamline Instrumentation, and Applications*

Feng, Y., Zhu, D., Feldkamp, J. M., Lemke, H. T., Robert, A., Fritz, D. M., Cammarata, M., Lee, S., Hastings, J. B., Turner, J. L.

SPIE-INT SOC OPTICAL ENGINEERING.2012

● **Photon beamlines and diagnostics at LCLS** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*

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● **First lasing and operation of an angstrom-wavelength free-electron laser** *NATURE PHOTONICS*

Emma, P., Akre, R., ARTHUR, J., Bionta, R., Bostedt, C., Bozek, J., Brachmann, A., Bucksbaum, P., Coffee, R., Decker, F., Ding, Y., Dowell, D., Edstrom, et al

2010; 4 (9): 641-647

● **High-energy X-ray diffuse scattering** *JOURNAL OF APPLIED CRYSTALLOGRAPHY*

Ramsteiner, I. B., Schoeps, A., Reichert, H., Dosch, H., Honkimaeki, V., Zhong, Z., Hastings, J. B.

2009; 42: 392-400

● **Gas detectors for x-ray lasers** *JOURNAL OF APPLIED PHYSICS*

- Tiedtke, K., Feldhaus, J., Hahn, U., Jastrow, U., Nunez, T., Tschentscher, T., Bobashev, S. V., Sorokin, A. A., Hastings, J. B., Moeller, S., Cibik, L., Gottwald, A., Hoehl, et al  
2008; 103 (9)
- **X-ray diffuse scattering measurements of nucleation dynamics at femtosecond resolution** *PHYSICAL REVIEW LETTERS*  
Lindenberg, A. M., Engemann, S., Gaffney, K. J., Sokolowski-Tinten, K., Larsson, J., Hillyard, P. B., Reis, D. A., Fritz, D. M., ARTHUR, J., Akre, R. A., George, M. J., Deb, A., Bucksbaum, et al  
2008; 100 (13)
  - **Formation of secondary electron cascades in single-crystalline plasma-deposited diamond upon exposure to femtosecond x-ray pulses** *JOURNAL OF APPLIED PHYSICS*  
Gabrysch, M., Marklund, E., Hajdu, J., Twitchen, D. J., Rudati, J., Lindenberg, A. M., Coleman, C., Falcone, R. W., Tschentscher, T., Moffat, K., Bucksbaum, P. H., Als-Nielsen, J., Nelson, et al  
2008; 103 (6)
  - **Femtosecond x-ray diffuse scattering measurements of semiconductor ablation dynamics** *Conference on High-Power Laser Ablation VII*  
Lindenberg, A. M., Engemann, S., Gaffney, K. J., Sokolowski-Tinten, K., Larsson, J., Reis, D., Lorazo, P., Hastings, J. B.  
SPIE-INT SOC OPTICAL ENGINEERING.2008
  - **Carrier-density-dependent lattice stability in InSb** *PHYSICAL REVIEW LETTERS*  
Hillyard, P. B., Gaffney, K. J., Lindenberg, A. M., Engemann, S., Akre, R. A., ARTHUR, J., Blome, C., Bucksbaum, P. H., Cavalieri, A. L., Deb, A., Falcone, R. W., Fritz, D. M., Fuoss, et al  
2007; 98 (12)
  - **Ultrafast bond softening in bismuth: Mapping a solid's interatomic potential with X-rays** *SCIENCE*  
Fritz, D. M., Reis, D. A., Adams, B., Akre, R. A., ARTHUR, J., Blome, C., Bucksbaum, P. H., Cavalieri, A. L., Engemann, S., Fahy, S., Falcone, R. W., Fuoss, P. H., Gaffney, et al  
2007; 315 (5812): 633-636
  - **Detectors for ultrafast X-ray experiments at SPPS** *SYNCHROTRON RADIATION INSTRUMENTATION, PTS 1 AND 2*  
Siddons, D. P., Kuczewski, A. J., Yu, B., Warren, J., Rudati, J., Fuoss, P., Hastings, J. B., Kaspar, J. D., Meyer, D. A.  
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  - **Ultrafast time-resolved electron diffraction with megavolt electron beams** *APPLIED PHYSICS LETTERS*  
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  - **Single-shot spectrometry for x-ray free-electron lasers** *PHYSICAL REVIEW LETTERS*  
Yabashi, M., Hastings, J. B., Zolotorev, M. S., Mimura, H., Yumoto, H., Matsuyama, S., Yamauchi, K., Ishikawa, T.  
2006; 97 (8)
  - **Megavolt electron beams for ultrafast time-resolved electron diffraction** *Conference of the American-Physical-Society-Topical-Group-on-Shock-Compression-of-Condensed-Matter*  
Rudakov, F. M., Hastings, J. B., Dowell, D. H., Schmerge, J. F., Weber, P. M.  
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  - **Observation of structural anisotropy and the onset of liquidlike motion during the nonthermal melting of InSb** *PHYSICAL REVIEW LETTERS*  
Gaffney, K. J., Lindenberg, A. M., Larsson, J., Sokolowski-Tinten, K., Blome, C., Synnergren, O., Sheppard, J., Coleman, C., MacPhee, A. G., Weinstein, D., Lowney, D. P., Allison, T., Matthews, et al  
2005; 95 (12)
  - **X-ray free-electron lasers** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*  
Feldhaus, J., ARTHUR, J., Hastings, J. B.  
2005; 38 (9): S799-S819
  - **Atomic-scale visualization of inertial dynamics** *SCIENCE*  
Lindenberg, A. M., Larsson, J., Sokolowski-Tinten, K., Gaffney, K. J., Blome, C., Synnergren, O., Sheppard, J., Coleman, C., MacPhee, A. G., Weinstein, D., Lowney, D. P., Allison, T. K., Matthews, et al  
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- **Clocking femtosecond x rays** *PHYSICAL REVIEW LETTERS*  
Cavalieri, A. L., Fritz, D. M., Lee, S. H., Bucksbaum, P. H., Reis, D. A., Rudati, J., Mills, D. M., Fuoss, P. H., Stephenson, G. B., Kao, C. C., Siddons, D. P., Lowney, D. P., MacPhee, et al  
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- **Opportunities and challenges using short-pulse X-ray sources.** *2nd International Conference on Photo-Induced Phase Transitions*  
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- **Future possibilities of the Linac Coherent Light Source** *JOURNAL OF SYNCHROTRON RADIATION*  
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- **FEL research and development at the SLAC sub-picosecond photon source, SPPS** *24th International Free Electron Laser Conference/9th Free Electron Laser Users Workshop*  
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- **X-RAY OPTICS AND MONOCHROMATORS FOR SYNCHROTRON RADIATION** *JOURNAL OF APPLIED PHYSICS*  
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- **MEASUREMENTS OF INTEGRATED INTENSITY NEAR ABSORPTION-EDGE WITH SYNCHROTRON RADIATION** *JOURNAL OF APPLIED CRYSTALLOGRAPHY*  
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- **STUDY OF SPEAR AS A DEDICATED SOURCE OF SYNCHROTRON RADIATION** *IEEE TRANSACTIONS ON NUCLEAR SCIENCE*  
CERINO, J., GOLDE, A., Hastings, J., LINDAU, I., SALSBURG, B., Winick, H., Lee, M., Morton, P., Garren, A.  
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