

# Stanford

---



## Sergio Carbajo

Casual - Nonexempt, SLAC National Accelerator Laboratory

---

### Bio

#### BIO

He graduated with a BS in Telecom Engineering from Tecnun, Universidad de Navarra in 2009. In 2012, he received his M.Sc. in Electrical and Computer Engineering from Colorado State University's National Science Foundation Engineering Research Center. Later he continued his joint doctoral program simultaneously at the Research Laboratory of Electronics, Massachusetts Institute of Technology and the Center for Free Electron Laser Science, Deutsches Elektronen Synchrotron, and obtained his Ph.D. in Physics in 2015. He has received several awards recognizing his contributions to ultrafast photon sciences and their application in life and energy sciences, including the 2021 Horizon Prize from the Royal Society of Chemistry, the 2021 SPIE Early Career Award, the Japan Society for the Promotion of Science Fellowship in 2019, SRI 2018 Young Scientist Award, and the PIER Helmholtz Foundation Dissertation Award in 2015, among others. Sergio teaches photonics, ultrafast and quantum optics, accelerator physics at UCLA and at the U.S. Particle Accelerator School. He currently holds various patents, is the author of over 100 peer-reviewed publications – including two book chapters – and has presented his work in over 60 international conferences.

#### CURRENT ROLE AT STANFORD

Dr. Sergio Carbajo is an assistant professor at the UCLA Electrical & Computer Engineering (ECE) and the UCLA Physics & Astronomy departments and visiting professor at Stanford University's Photon Science Division at SLAC National Accelerator Laboratory. He is the founder and director of the Quantum Light-Matter Cooperative, a scientific consortium whose mission is to understand, design, and ultimately control light-driven physical processes to help solve interconnected socio-technological challenges.

Photon sciences and technologies establish the building blocks for myriad scientific and engineering frontiers in life and energy sciences. Because of this overarching functionality, the Quantum Light-Matter Cooperative's areas of study include life sciences, biochemistry, quantum optics, and information sciences, and environmental and chemical engineering. The cooperative seeks to help solve major life and energy challenges by examining the cooperative interaction between photons and matter, and its methodologies are informed by a critically interdisciplinary approach to the science and applications of light by design. He is an active faculty member of the California NanoSystems Institute and the Center for Quantum Science and Engineering. Photon and particle sources are powerful tools with extremely high societal impact because they underpin myriad groundbreaking scientific, technological, and medical advancements. X-ray free electron lasers (XFEL) are the flagship of these instruments, which in the relatively short time since their advent have demonstrated the capacity to reveal conformational dynamics in biomolecules and ultrafast chemistry at atomic-level spatial and femtosecond temporal resolutions. Motivated by this overarching relevance, Sergio has nurtured a research career that is founded on the unification of quantum and nonlinear optics and laser-matter interactions to develop instruments capable of tackling grand fundamental questions in physics, chemistry, and biology. At SLAC, Prof. Carbajo bridges expertise across disciplines in photon sciences and accelerator physics for the advancement of next-generation XFEL technology and science, namely LCLS and LCLS-II science and instrumentation, collaboratively with faculty, post-doctoral fellows, graduate students, technicians, and engineers from various directorates at SLAC and departments at Stanford.

Prof. Carbajo is also the Director of Diversity at the UCLA ECE department and the founder and director of the Queered Science and Technology Center (QSTC) at UCLA. He is laying a ground-breaking framework to address overarching issues of diversity and critical representation in STEM through queer, radical feminist, and black analyses of the impact of science & technology in society. The QSTC employs this critical framework to destabilize sexual, gendered, racialized, anthropocentric, and able-bodies logics and hierarchies in challenging and rethinking knowledge production, as a scientific exercise and introduces new methodological resources for critical interdisciplinarity in traditional STEM studies. In this capacity, he has the opportunity to recruit outstanding faculty, staff, and students, create an exciting and diverse intellectual and educational community; strategically seek out new opportunities in research and education; foster new interdisciplinary connections across campus; and actively empower involvement of (future) STEM workforce, particularly those from underrepresented backgrounds, to affect social change that is representative of the public's interests. Partnered with non-profit institutions, he participates in several University, county and state, and federal-level sponsored programs tailored to promote equity in STEM fields through action in distinct areas of sciences and engineering.

## Publications

---

### PUBLICATIONS

- **Rational Control of Off-State Heterogeneity in a Photoswitchable Fluorescent Protein Provides Switching Contrast Enhancement.** *Chemphyschem : a European journal of chemical physics and physical chemistry*  
Adam, V., Hadjidemetriou, K., Jensen, N., Shoeman, R. L., Woodhouse, J., Aquila, A., Banneville, A., Barends, T. R., Bezchastnov, V., Boutet, S., Byrdin, M., Cammarata, M., Carbajo, et al  
2022; e202200192
- **Phase retrieval and reconstruction of coherent synthesis by genetic algorithm** *JOURNAL OF PHYSICS-PHOTONICS*  
Lemons, R., Carbajo, S.  
2022; 4 (2)
- **Temporal shaping of narrow-band picosecond pulses via noncolinear sum-frequency mixing of dispersion-controlled pulses** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*  
Lemons, R., Neveu, N., Duris, J., Marinelli, A., Durfee, C., Carbajo, S.  
2022; 25 (1)
- **Structural dynamics in the water and proton channels of photosystem II during the S2 to S3 transition.** *Nature communications*  
Hussein, R., Ibrahim, M., Bhowmick, A., Simon, P. S., Chatterjee, R., Lassalle, L., Doyle, M., Bogacz, I., Kim, I., Cheah, M. H., Gul, S., de Lichtenberg, C., Chernev, et al  
2021; 12 (1): 6531
- **Light by design: emerging frontiers in ultrafast photon sciences and light-matter interactions** *JOURNAL OF PHYSICS-PHOTONICS*  
Carbajo, S.  
2021; 3 (3)
- **Early-stage dynamics of chloride ion-pumping rhodopsin revealed by a femtosecond X-ray laser** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Yun, J., Li, X., Yue, J., Park, J., Jin, Z., Li, C., Hu, H., Shi, Y., Pandey, S., Carbajo, S., Boutet, S., Hunter, M. S., Liang, et al  
2021; 118 (13)
- **Early-stage dynamics of chloride ion-pumping rhodopsin revealed by a femtosecond X-ray laser.** *Proceedings of the National Academy of Sciences of the United States of America*  
Yun, J., Li, X., Yue, J., Park, J., Jin, Z., Li, C., Hu, H., Shi, Y., Pandey, S., Carbajo, S., Boutet, S., Hunter, M. S., Liang, et al  
2021; 118 (13)
- **Observation of shock-induced protein crystal damage during megahertz serial femtosecond crystallography** *PHYSICAL REVIEW RESEARCH*  
Gruenbein, M. L., Foucar, L., Gorel, A., Hilpert, M., Kloos, M., Nass, K., Kovacs, G., Roome, C. M., Shoeman, R. L., Stricker, M., Carbajo, S., Colucho, W., Gilevich, et al  
2021; 3 (1)
- **Integrated structured light architectures.** *Scientific reports*  
Lemons, R., Liu, W., Frisch, J. C., Fry, A., Robinson, J., Smith, S. R., Carbajo, S.  
2021; 11 (1): 796

- **Effect of X-ray free-electron laser-induced shockwaves on haemoglobin microcrystals delivered in a liquid jet.** *Nature communications*  
Grünbein, M. L., Gorel, A. n., Foucar, L. n., Carbajo, S. n., Colocho, W. n., Gilevich, S. n., Hartmann, E. n., Hilpert, M. n., Hunter, M. n., Kloos, M. n., Koglin, J. E., Lane, T. J., Lewandowski, et al  
2021; 12 (1): 1672
- **Structured Photonics in Light-Matter Interactions, Accelerators, and X-ray Lasers**  
Carbajo, S., IEEE  
IEEE.2021
- **Nonlinearly Shaped Pulses in the LCLS-II Photoinjector**  
Neveu, N., Lemons, R., Duris, J., Ding, Y., Marinelli, A., Mayes, C., Durfee, C., Carbajo, S., IEEE  
IEEE.2021
- **Femtosecond Slicing for the MHz Repetition Rate LCLS-II X-ray Free Electron Laser**  
Duris, J., Lemons, R., Zhang, Z., Ding, Y., Marinelli, A., Carbajo, S., IEEE  
IEEE.2021
- **Towards Real-time Adaptable Machine Learning-based Photoinjector Shaping**  
Hirschman, J., Lemons, R., Coffee, R., Belli, F., Carbajo, S., IEEE  
IEEE.2021
- **Ultrafast X-ray scattering offers a structural view of excited-state charge transfer.** *Proceedings of the National Academy of Sciences of the United States of America*  
Yong, H. n., Xu, X. n., Ruddock, J. M., Stankus, B. n., Carrascosa, A. M., Zotev, N. n., Bellshaw, D. n., Du, W. n., Goff, N. n., Chang, Y. n., Boutet, S. n., Carbajo, S. n., Koglin, et al  
2021; 118 (19)
- **Ultrafast structural changes within a photosynthetic reaction centre.** *Nature*  
Dods, R., Bath, P., Morozov, D., Gagner, V. A., Arnlund, D., Luk, H. L., Kubel, J., Maj, M., Vallejos, A., Wickstrand, C., Bosman, R., Beyerlein, K. R., Nelson, et al  
2020
- **Long-term hybrid stabilization of the carrier-envelope phase** *OPTICS EXPRESS*  
Hirschman, J., Lemons, R., Chansky, E., Steinmeyer, G., Carbajo, S.  
2020; 28 (23): 34093–103
- **Untangling the sequence of events during the S2 S3 transition in photosystem II and implications for the water oxidation mechanism.** *Proceedings of the National Academy of Sciences of the United States of America*  
Ibrahim, M., Fransson, T., Chatterjee, R., Cheah, M. H., Hussein, R., Lassalle, L., Sutherlin, K. D., Young, I. D., Fuller, F. D., Gul, S., Kim, I., Simon, P. S., de Lichtenberg, et al  
2020
- **Observation of the molecular response to light upon photoexcitation.** *Nature communications*  
Yong, H., Zotev, N., Ruddock, J. M., Stankus, B., Simmermacher, M., Carrascosa, A. M., Du, W., Goff, N., Chang, Y., Bellshaw, D., Liang, M., Carbajo, S., Koglin, et al  
2020; 11 (1): 2157
- **Laguerre-Gaussian Mode Laser Heater for Microbunching Instability Suppression in Free-Electron Lasers.** *Physical review letters*  
Tang, J., Lemons, R., Liu, W., Vetter, S., Maxwell, T., Decker, F. J., Lutman, A., Krzywinski, J., Marcus, G., Moeller, S., Huang, Z., Ratner, D., Carbajo, et al  
2020; 124 (13): 134801
- **Laguerre-Gaussian Mode Laser Heater for Microbunching Instability Suppression in Free-Electron Lasers** *PHYSICAL REVIEW LETTERS*  
Tang, J., Liu, W., Lemons, R., Vetter, S., Maxwell, T., Decker, F., Lutman, A., Krzywinski, J., Marcus, G., Moeller, S., Ratner, D., Huang, Z., Carbajo, et al  
2020; 124 (13)
- **Comparing serial X-ray crystallography and microcrystal electron diffraction (MicroED) as methods for routine structure determination from small macromolecular crystals.** *IUCrJ*  
Wolff, A. M., Young, I. D., Sierra, R. G., Brewster, A. S., Martynowycz, M. W., Nango, E., Sugahara, M., Nakane, T., Ito, K., Aquila, A., Bhowmick, A., Biel, J. T., Carbajo, et al  
2020; 7 (Pt 2): 306–23

- **Single-Digit Attosecond Carrier-Envelope Phase Stabilization of an Er:Yb:Glass Laser with Feed-Forward Technique**  
Lemons, R., Liu, W., De Fuentes, I., Droste, S., Steinmeyer, G., Durfee, C. G., Carbajo, S., IEEE  
IEEE.2020
- **The LCLS-II Photo-Injector Drive Laser System**  
Gilevich, S., Alverson, S., Carbajo, S., Droste, S., Edstrom, S., Fry, A., Greenberg, M., Lemons, R., Miahnahri, A., Polzin, W., Vetter, S., Zhou, F., IEEE  
IEEE.2020
- **Optimization of Simulated Coherent Combination System Using Fourier Optics Based Genetic Algorithm**  
Lemons, R., Carbajo, S., IEEE  
IEEE.2020
- **Carrier-envelope phase stabilization of an Er:Yb:glass laser via a feed-forward technique** *OPTICS LETTERS*  
Lemons, R., Liu, W., de Fuentes, I., Droste, S., Steinmeyer, G., Durfee, C. G., Carbajo, S.  
2019; 44 (22): 5610–13
- **Editorial: Lasers in Accelerator Science and Secondary Emission Light Source Technology** *FRONTIERS IN PHYSICS*  
Carbajo, S., Fallahi, A., Faure, J., Wong, L.  
2019; 7
- **Three-dimensional view of ultrafast dynamics in photoexcited bacteriorhodopsin** *NATURE COMMUNICATIONS*  
Kovacs, G., Colletier, J., Gruenbein, M., Yang, Y., Stensitzki, T., Batyuk, A., Carbajo, S., Doak, R., Ehrenberg, D., Foucar, L., Gasper, R., Gorel, A., Hilpert, et al  
2019; 10: 3177
- **Ultrafast X-ray scattering reveals vibrational coherence following Rydberg excitation.** *Nature chemistry*  
Stankus, B., Yong, H., Zotev, N., Ruddock, J. M., Bellshaw, D., Lane, T. J., Liang, M., Boutet, S., Carbajo, S., Robinson, J. S., Du, W., Goff, N., Chang, et al  
2019
- **Simplicity Beneath Complexity: Counting Molecular Electrons Reveals Transients and Kinetics of Photodissociation Reactions** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*  
Ruddock, J. M., Zotev, N., Stankus, B., Yong, H., Bellshaw, D., Boutet, S., Lane, T. J., Liang, M., Carbajo, S., Du, W., Kirrander, A., Minitti, M., Weber, et al  
2019; 58 (19): 6371–75
- **Simplicity beneath Complexity: Counting Molecular Electrons Reveals Transients and Kinetics of Photodissociation Reactions.** *Angewandte Chemie (International ed. in English)*  
Ruddock, J. M., Zotev, N., Stankus, B., Yong, H., Bellshaw, D., Boutet, S., Lane, T. J., Liang, M., Carbajo, S., Du, W., Kirrander, A., Minitti, M. P., Weber, et al  
2019
- **The Macromolecular Femtosecond Crystallography Instrument at the Linac Coherent Light Source** *JOURNAL OF SYNCHROTRON RADIATION*  
Sierra, R. G., Batyuk, A., Sun, Z., Aquila, A., Hunter, M. S., Lane, T. J., Liang, M., Yoon, C., Alonso-Mori, R., Armenta, R., Castagna, J., Hollenbeck, M., Osier, et al  
2019; 26: 346–57
- **A Simple Model for the Fields of a Chirped Laser Pulse With Application to Electron Laser Acceleration** *FRONTIERS IN PHYSICS*  
Salamin, Y. I., Carbajo, S.  
2019; 7
- **Simulated XUV photoelectron spectra of THz-pumped liquid water.** *The Journal of chemical physics*  
Arnold, C., Inhester, L., Carbajo, S., Welsch, R., Santra, R.  
2019; 150 (4): 044505
- **Simulated XUV photoelectron spectra of THz-pumped liquid water** *JOURNAL OF CHEMICAL PHYSICS*  
Arnold, C., Inhester, L., Carbajo, S., Welsch, R., Santra, R.  
2019; 150 (4)
- **Nanofocus characterization at the Coherent X-ray Imaging instrument using 2D single grating interferometry**  
Seaberg, M. H., Aquila, A., Liang, M., Lee, H., Nagler, B., Liu, Y., Sakdinawat, A., Seiboth, F., Makita, M., Sun, Y., Signorato, R., Carbajo, S., Feng, et al  
SPIE-INT SOC OPTICAL ENGINEERING.2019
- **Laguerre-Gaussian Mode Laser Heater for Microbunching Instability Suppression in Free Electron Lasers**

- Tang, J., Liu, W., Lemons, R., Vetter, S., Maxwell, T., Decker, F., Lutman, A., Krzywinski, J., Marcus, G., Moeller, S., Ratner, D., Huang, Z., Carbajo, et al  
IEEE.2019
- **Programmable Control of Femtosecond Structured Light**  
Lemons, R., Liu, W., Durfee, C. G., Frisch, J. C., Smith, S., Robinson, J., Fry, A., Carbajo, S., IEEE  
IEEE.2019
  - **Scattering off molecules far from equilibrium.** *The Journal of chemical physics*  
Yong, H. n., Ruddock, J. M., Stankus, B. n., Ma, L. n., Du, W. n., Goff, N. n., Chang, Y. n., Zotev, N. n., Bellshaw, D. n., Boutet, S. n., Carbajo, S. n., Koglin, J. E.,  
Liang, et al  
2019; 151 (8): 084301
  - **A deep UV trigger for ground-state ring-opening dynamics of 1,3-cyclohexadiene.** *Science advances*  
Ruddock, J. M., Yong, H. n., Stankus, B. n., Du, W. n., Goff, N. n., Chang, Y. n., Odate, A. n., Carrascosa, A. M., Bellshaw, D. n., Zotev, N. n., Liang, M. n.,  
Carbajo, S. n., Koglin, et al  
2019; 5 (9): eaax6625
  - **Structure and dynamics of chloride ion pumping rhodopsin revealed by time resolved SFX and atomic molecular dynamics simulations**  
Liu, H., Yun, J., Li, X., Park, J., Jin, Z., Shi, Y., Li, C., Hu, H., Wang, Y., Pandey, S., Carbajo, S., Zatsepin, N., Weiersta, et al  
INT UNION CRYSTALLOGRAPHY.2019: A375
  - **The Macromolecular Femtosecond Crystallography Instrument at the Linac Coherent Light Source.** *Journal of synchrotron radiation*  
Sierra, R. G., Batyuk, A. n., Sun, Z. n., Aquila, A. n., Hunter, M. S., Lane, T. J., Liang, M. n., Yoon, C. H., Alonso-Mori, R. n., Armenta, R. n., Castagna, J. C.,  
Hollenbeck, M. n., Osier, et al  
2019; 26 (Pt 2): 346–57
  - **Determining Orientations of Optical Transition Dipole Moments Using Ultrafast X-ray Scattering** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*  
Yong, H., Zotev, N., Stankus, B., Ruddock, J. M., Bellshaw, D., Boutet, S., Lane, T. J., Liang, M., Carbajo, S., Robinson, J. S., Du, W., Goff, N., Chang, et al  
2018; 9 (22): 6556–62
  - **Structures of the intermediates of Kok's photosynthetic water oxidation clock.** *Nature*  
Kern, J., Chatterjee, R., Young, I. D., Fuller, F. D., Lassalle, L., Ibrahim, M., Gul, S., Fransson, T., Brewster, A. S., Alonso-Mori, R., Hussein, R., Zhang, M.,  
Douthit, et al  
2018
  - **Laguerre-Gaussian and beamlet array as second generation laser heater profiles** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*  
Liebster, N., Tang, J., Ratner, D., Liu, W., Vetter, S., Huang, Z., Carbajo, S.  
2018; 21 (9)
  - **Self-consistent internal calibration of x-ray scattering patterns from polarized radiation sources**  
Goff, N., Stankus, B., Ruddock, J., Zhang, Y., Lane, T., Liang, M., Boutet, S., Carbajo, S., Robinson, J., Koglin, J., Aquila, A., Minitti, M., Weber, et al  
AMER CHEMICAL SOC.2018
  - **Deconvoluting the isotropic and anisotropic ultrafast x-ray scattering of gas-phase N-methylmorpholine following Rydberg excitation**  
Stankus, B., Ruddock, J., Yong, H., Zotev, N., Bellshaw, D., Lane, T., Boutet, S., Liang, M., Carbajo, S., Robinson, J., Koglin, J., Aquila, A., Zhang, et al  
AMER CHEMICAL SOC.2018
  - **Laser power meters as an X-ray power diagnostic for LCLS-II**  
Heimann, P., Moeller, S., Carbajo, S., Song, S., Dakovski, G., Nordlund, D., Fritz, D.  
INT UNION CRYSTALLOGRAPHY.2018: 72–76
  - **Power handling for LCoS spatial light modulators**  
Carbajo, S., Bauchert, K., Kudryashov, A. V., Paxton, A. H., Ilchenko, V. S.  
SPIE-INT SOC OPTICAL ENGINEERING.2018
  - **Chromophore twisting in the excited state of a photoswitchable fluorescent protein captured by time-resolved serial femtosecond crystallography** *NATURE CHEMISTRY*  
Coquelle, N., Sliwa, M., Woodhouse, J., Schiro, G., Adam, V., Aquila, A., Barends, T. M., Boutet, S., Byrdin, M., Carbajo, S., De la Mora, E., Doak, R., Feliks, et al  
2018; 10 (1): 31–37

- **Determining Orientations of Optical Transition Dipole Moments using Ultrafast X-Ray Scattering.** *The journal of physical chemistry letters*  
Yong, H. n., Zotev, N. n., Stankus, B. n., Ruddock, J. M., Bellshaw, D. n., Boutet, S. n., Lane, T. J., Liang, M. n., Carbajo, S. n., Robinson, J. S., Du, W. n., Goff, N. n., Chang, et al  
2018
- **Retinal isomerization in bacteriorhodopsin captured by a femtosecond x-ray laser.** *Science (New York, N.Y.)*  
Nogly, P. n., Weinert, T. n., James, D. n., Carbajo, S. n., Ozerov, D. n., Furrer, A. n., Gashi, D. n., Borin, V. n., Skopintsev, P. n., Jaeger, K. n., Nass, K. n., B ath, P. n., Bosman, et al  
2018; 361 (6398)
- **Laser-Induced Linear-Field Particle Acceleration in Free Space** *SCIENTIFIC REPORTS*  
Wong, L., Hong, K., Carbajo, S., Fallahi, A., Piot, P., Soljacic, M., Joannopoulos, J. D., Kaertner, F. X., Kaminer, I.  
2017; 7: 11159
- **From Macrocystals to Microcrystals: A Strategy for Membrane Protein Serial Crystallography** *STRUCTURE*  
Dods, R., Bath, P., Arnlund, D., Beyerlein, K. R., Nelson, G., Liang, M., Harimoorthy, R., Berntsen, P., Malmerberg, E., Johansson, L., Andersson, R., Bosman, R., Carbajo, et al  
2017; 25 (9): 1461+
- **Narrowband terahertz generation with chirped-and-delayed laser pulses in periodically poled lithium niobate** *OPTICS LETTERS*  
Ahr, F., Jolly, S. W., Matlis, N. H., Carbajo, S., Kroh, T., Ravi, K., Schimpf, D. N., Schulte, J., Ishizuki, H., Taira, T., Maier, A. R., Kaertner, F. X.  
2017; 42 (11): 2118–21
- **Narrowband Terahertz Generation with Broadband Chirped Pulse Trains in Periodically Poled Lithium Niobate**  
Jolly, S. W., Ahr, F., Matlis, N. H., Carbajo, S., Ravi, K., Kroh, T., Schulte, J., Schimpf, D. N., Maier, A. R., Kaertner, F. X., IEEE  
IEEE.2017
- **Narrowband THz generation via chirp-and-delay in PPLN**  
Ahr, F., Jolly, S. W., Matlis, N. H., Carbajo, S., Ravi, K., Kroh, T., Schulte, J., Schimpf, D. N., Maier, A. R., Kaertner, F. X., IEEE  
IEEE.2017
- **Direct longitudinal laser acceleration of electrons in free space** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*  
Carbajo, S., Nanni, E. A., Wong, L., Moriena, G., Keathley, P. D., Laurent, G., Miller, R., Kaertner, F. X.  
2016; 19 (2)
- **Pulse-train pumping for efficient narrowband terahertz generation in periodically poled lithium niobate**  
Ahr, F., Ravi, K., Carbajo, S., Jolly, S., Kroh, T., Schimpf, D., Matlis, N., Maier, A. R., Kaertner, F. X., IEEE  
IEEE.2016
- **Efficient narrowband terahertz generation in cryogenically cooled periodically poled lithium niobate** *OPTICS LETTERS*  
Carbajo, S., Schulte, J., Wu, X., Ravi, K., Schimpf, D. N., Kaertner, F. X.  
2015; 40 (24): 5762–65
- **Theory of terahertz generation by optical rectification using tilted-pulse-fronts** *OPTICS EXPRESS*  
Ravi, K., Huang, W., Carbajo, S., Nanni, E. A., Schimpf, D. N., Ippen, E. P., Kaertner, F. X.  
2015; 23 (4): 5253–76
- **Efficient Generation of Terahertz Radiation at 800 nm Wavelength**  
Wu, X., Carbajo, S., Ravi, K., Huang, W., Fang, S., Ahr, F., Cirmi, G., Rossi, G. M., Muecke, O. D., Kaertner, F. X., IEEE  
IEEE.2015
- **On Extracting the Maximum Terahertz Conversion Efficiency from Optical Rectification in Lithium Niobate**  
Carbajo, S., Alcorta, P., Calendron, A., Cankaya, H., Wu, X., Ravi, K., Ahr, F., Huang, W., Kaertner, F. X., IEEE  
IEEE.2015
- **Efficiency Scaling of Narrowband Terahertz Wave Generation in PPLN by Optimizing the Pump-Pulse Format**  
Schulte, J., Carbajo, S., Ravi, K., Schimpf, D. N., Kaertner, F. X., IEEE  
IEEE.2015
- **Terahertz generation in lithium niobate driven by Ti:sapphire laser pulses and its limitations** *OPTICS LETTERS*

Wu, X., Carbajo, S., Ravi, K., Ahr, F., Cirimi, G., Zhou, Y., Muecke, O. D., Kaertner, F. X.  
2014; 39 (18): 5403–6

● **Limitations to THz generation by optical rectification using tilted pulse fronts** *OPTICS EXPRESS*

Ravi, K., Huang, W., Carbajo, S., Wu, X., Kaertner, F.  
2014; 22 (17): 20239–51

● **Efficient generation of ultra-intense few-cycle radially polarized laser pulses** *OPTICS LETTERS*

Carbajo, S., Granados, E., Schimpf, D., Sell, A., Hong, K., Moses, J., Kaertner, F. X.  
2014; 39 (8): 2487–90

● **Imaging at the Nanoscale With Practical Table-Top EUV Laser-Based Full-Field Microscopes** *IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS*

Brizuela, F., Howlett, I. D., Carbajo, S., Peterson, D., Sakdinawat, A., Liu, Y., Attwood, D. T., Marconi, M. C., Rocca, J. J., Menoni, C. S.  
2012; 18 (1): 434–42

● **Assessment of illumination characteristics of soft x-ray laser-based full-field microscopes**

Howlett, I. D., Brizuela, F., Carbajo, S., Peterson, D., Sakdinawat, A., Liu, Y., Attwood, D. T., Marconi, M. C., Rocca, J. J., Menoni, C. S., Dunn, J., Klisnick, A.  
SPIE-INT SOC OPTICAL ENGINEERING.2011

● **Extreme ultraviolet laser-based table-top aerial image metrology of lithographic masks** *OPTICS EXPRESS*

Brizuela, F., Carbajo, S., Sakdinawat, A., Alessi, D., Martz, D. H., Wang, Y., Luther, B., Goldberg, K. A., Mochi, I., Attwood, D. T., La Fontaine, B., Rocca, J. J., Menoni, et al  
2010; 18 (14): 14467–73

● **Table-top Extreme Ultraviolet Laser Aerial Imaging of Lithographic Masks**

Brizuela, F., Carbajo, S., Sakdinawat, A., Wang, Y., Alessi, D., Martz, D., Luther, B., Goldberg, K., Attwood, D., La Fontaine, B., Rocca, J., Menoni, C., IEEE  
IEEE.2010