

# Stanford

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## Sergio Carbajo

Casual - Nonexempt, SLAC National Accelerator Laboratory

### Bio

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#### 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

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