



Sergio Carbajo

Casual - Nonexempt, SLAC National Accelerator Laboratory

Bio

BIO

Over the last decade, Sergio's research has been dedicated to the pursuit of transformational photon and particle sources and their applications in basic and environmental sciences, medicine, and industry. 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. Because widespread access to these instruments is paramount to the democratization of their benefits and impact, he has also focused on compact accelerator technologies by tapping into a broad range of methodologies, including free-space, terahertz, and hybrid accelerators, as well as plasma-based x-ray sources—and proven their competitiveness in scientific and commercial applications.

Sergio graduated with a BS in Telecom Engineering from Universidad de Navarra in 2009. In 2012, he received his M.Sc. in Electrical and Computer Engineering from Colorado State University. 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 PhD in Physics in 2015 from University of Hamburg. He has received a number of awards recognizing his contributions to the development of novel ultrafast photon and particle sources, and to their application in laser-matter interactions, including the 2021 SPIE Early Career Achievement 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. He is also actively focused on professional service and outreach activities devoted to underrepresented minorities and to promote equity in educational and professional opportunities, and is currently serves as co-chair of the LGBTQ + Employee Resource Group at SLAC.

CURRENT ROLE AT STANFORD

Sergio Carbajo is a staff scientist and principal investigator at the Linac Coherent Light Source, SLAC National Accelerator Laboratory. His work is founded on the unification of laser and accelerator physics to develop transformational instruments that tackle grand fundamental questions in physics, chemistry, and biology.

He currently leads R&D efforts in Lasers for Accelerators (L4A) at the Linac Coherent Light Source (LCLS), SLAC National Accelerator Laboratory. The L4A research underscores the development and application of novel ultrafast optical, electron, and x-ray methods and technologies in basic energy sciences. Sergio also leads various projects in ultrafast molecular-scale dynamics exploiting these unique tools to study applications of physical chemistry in biology and environmental sciences. By working in these two disciplines—developing scientific tools and their application in basic sciences—he is able to drive new instrumentation requirements and enable scientific discoveries at fundamental spatio-temporal scales.

Sergio is also invested in community organizing and leadership to advance diversity and inclusion (D&I) policymaking, advocacy and engagement in scientific and academic environments within and beyond the Stanford community. He participates in a number of lab- and University-level, San Mateo County-level, and Department of Energy (DOE) sponsored programs at various academic levels, all of which are tailored to promote equity in STEM fields through action in distinct areas of sciences and engineering.

Publications

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