Stanford

Emilio Alessandro Nanni

Associate Professor of Particle Physics and Astrophysics and of Photon Science

Bio

BIO

Emilio received his B.S. in Electrical Engineering and Physics from Missouri University of Science and Technology in 2007. After graduating he worked for the NASA Marshall Space Flight Center developing non-destructive evaluation techniques for applications related to the US space program. He completed his PhD in Electrical Engineering from the Massachusetts Institute of Technology in 2013 where he worked on high-frequency high-power THz sources and the development of Nuclear Magnetic Resonance spectrometers using Dynamic Nuclear Polarization. His thesis was on the first photonic-band-gap gyrotron travelling wave amplifier which demonstrated record power and gain levels in the THz frequency band.

He completed his postdoc at MIT with a joint appointment in the Nuclear Reactor Lab and the Research Laboratory for Electronics at MIT where he demonstrated the first acceleration of electrons with optically generated THz pulses. He joined the Technology Innovation Directorate at SLAC in August of 2015 where he continues his work on high power, high-frequency vacuum electron devices; optical THz amplifiers; electron-beam dynamics; and advanced accelerator concepts.

ACADEMIC APPOINTMENTS

- Associate Professor, Particle Physics and Astrophysics
- Associate Professor, Photon Science Directorate

LINKS

- C3 Website: https://web.slac.stanford.edu/c3/

Teaching

COURSES

2023-24

- Mechanics: PHYSICS 41 (Aut)

2022-23

- Mechanics: PHYSICS 41 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Tony Zhang

Doctoral Dissertation Advisor (AC)

Debadri Das, Sophia Morton, Farhan Rawnak, Charlotte Wehner

Doctoral Dissertation Co-Advisor (AC)

Dimitris Ntounis

Publications

PUBLICATIONS

- **Beam-beam backgrounds for the Cool Copper Collider** *Journal of Instrumentation*
  Ntounis, D., Gordon, L., Gray, L., Mettner`, E., Barklow, T., Nanni, E. A., Vernieri, C., et al
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- **Optically accessible high-finesse millimeter-wave resonator for cavity quantum electrodynamics with atom arrays** *PHYSICAL REVIEW APPLIED*
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- **High-power test of a C-band linear accelerating structure with an RFSoC-based LLRF system** *REVIEW OF SCIENTIFIC INSTRUMENTS*
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- **Summary of Working Group 7: Linear colliders** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
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- **Multi-objective Bayesian active learning for MeV-ultrafast electron diffraction.** *Nature communications*
  Ji, F., Edelen, A., Roussel, R., Shen, X., Miskovich, S., Weathersby, S., Luo, D., Mo, M., Kramer, P., Mayes, C., Othman, M. A., Nanni, E., Wang, et al
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- **Giant Terahertz Birefringence in an Ultrathin Anisotropic Semimetal.** *Nano letters*
  Sie, E. J., Othman, M. A., Nyby, C. M., Pemmaraju, D., Garcia, C. A., Wang, Y., Guzelturk, B., Xia, C., Xiao, J., Poletayev, A., Ofori-Okai, B. K., Hoffmann, M. C., Park, et al
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- **Improved temporal resolution in ultrafast electron diffraction measurements through THz compression and time-stamping.** *Structural dynamics (Melville, N.Y.)*
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  van der Graaf, H., van Bakel, N., Bouwens, B., Breidenbach, M., Haase, A., van Heijningen, J., Koushik, A., Nanni, E., du Pree, T., van Remortel, N., Vernieri, C.
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- **Parallel-Plate THz Waveguides for Relativistic Electron Bunch Compression**
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