

Curriculum Vitae

PERSONAL INFORMATION

Alloatti, Luca, PhD

Year of birth: 1980

Nationality: Italian and Swiss



• EDUCATION

- 2012 PhD at the Department of Electrical Engineering and Communication Technologies, Karlsruhe Institute of Technology (KIT), Germany
- 2006 “Diploma di Licenza” (Final mark: 70/70 cum laude)
Class of Science, Scuola Normale Superiore di Pisa, Italy
- 2004 Master (Final mark: 110/110 cum laude)
Department of Physics, University of Pisa, Italy

• POSITIONS

- 2022 – current President of the Free Silicon Foundation (I) ETS, CF: 90039680518
- 2020 – current President of the Free Silicon Foundation (<https://f-si.org>)
- 2017 – 2020 Group Leader (funding: ETH internal grant)
Institute of Electromagnetic Fields (IEF, ITET)
ETH-Zurich
- 2015 – 2017 Postdoc
Department of Electrical Engineering and Information Technologies,
ETH-Zurich
- 2013 – 2015 Postdoctoral Associate
Department of Electrical Engineering and Computer Science,
Massachusetts Institute of Technology (MIT), USA
- 2012 – 2013 Postdoc
Department of Electrical Engineering and Communication Technologies,
Karlsruhe Institute of Technology (KIT), Germany
- 2008 – 2012 Research Assistant
Research topic: silicon photonics
Department of Electrical Engineering and Communication Technologies,
Karlsruhe Institute of Technology (KIT), Germany
- 2004 – 2008 Employee
Research topic: fs nonlinear optics, and statistical mechanics.
Max Plank Institute (MPI) for Metal Research, Germany

- **GRANTS, FELLOWSHIPS AND AWARDS**

- 2024 Participant of the European project “NGI Zero Commons” which promotes and finances open-source projects (<https://nlnet.nl/commonsfund/> , ID number 101135429).
- 2022 “Coordination and Support Action (CSA)” grant from the European Commission for supporting the development of open-source integrated circuits. The project is called “Go IT” (<https://goit-project.eu> , ID number 101070660). The project has started on September 1 2022 with a total budget of 2 MEur. The proposal text can be downloaded at: [https://wiki.f-si.org/index.php/Horizon_2021_Coordination_and_Support_Action_\(CSA\)_proposal](https://wiki.f-si.org/index.php/Horizon_2021_Coordination_and_Support_Action_(CSA)_proposal)
- 2018 ERC Starting Grant on electronic-photonic integration in advanced nodes. Accepted for funding but beyond available budget.
- 2017 Leader and coordinator of an H2020 ICT30 proposal. Accepted for funding but beyond available budget.
- 2016 ETH internal grant on monolithic electronic-photonic integration.
- 2015 ERC Starting Grant on second-order nonlinear nanolaminates. Accepted for funding but beyond available budget.
- 2015 MIT “Translational Fellows Program” for creating a start-up based on monolithic integration of silicon photonics
- 1999 – 2004 Scholarship by the Scuola Normale Superiore di Pisa, Italy
- 1999 Prize for the best experimental work at the Italian national competition of physics (physics Olympiad), Italy

- **SUPERVISION OF STUDENTS**

- 2017 – 2020 Supervision of three PhD students, ETH
- 2008 – 2020 Supervision of over ten bachelor/master students at KIT, MIT and ETH

- **TEACHING ACTIVITIES**

- 2020 Preparation of a novel class entitled “VLSI physical design” aimed at teaching the fundamentals of transistors, and the back-end design flow using open-source tools.
- 2018 Creation of the novel lecture “Python for engineers”.
- Since 2008 Teaching assistant of several classes on nonlinear optics, photonics and optoelectronic devices.

- **INSTITUTIONAL RESPONSIBILITIES**

- 2019-2024 Organizer of the four editions of the Free Silicon Conference (last edition: <https://wiki.f-si.org/index.php/FSiC2024>)
- 2022 Co-founder of the Free Silicon Foundation (I) ETS
- 2018 Co-founder of the Free Silicon Foundation (<https://f-si.org>)
- 2017 Sub-committee member (computercom) at the European Conference on Optical Communications ([ECOC2017](#))
- 2017 Organizer of the “[Silicon Photonics Workshop](#)” at ECOC2017

- **LANGUAGES**

- Italian: mother tongue
- French: C1
- English: C1
- German: B2

- **PUBLICATION LIST**

Identifiers

- ORCID: 0000-0002-1245-4179
- ResearcherID: A-3817-2015

Summary (data from Web of Science, <https://apps.webofknowledge.com> , stand 2022)

- o h-index: 23
- o Last-author papers: 3
- o First-author journal papers: 12
- o First-author conference papers: 6
- o Total number of papers: 100+
- o Patents: 5. Three of these are licenced to a computercom company
- o Invited talks: 10

Selected publications

1. M. Eppenberger, M. Bonomi, D. Moor, M. Mueller, B. I. Bitachon, T. Burger, and **L. Alloatti**, "Compact Optical TX and RX Macros for Computercom Monolithically Integrated in 45nm CMOS", *Journal of Lightwave Technology*, 39(21), 6869 (2021)
2. M. Eppenberger, M. Bonomi, D. Moor, M. Mueller, B. I. Bitachon, T. Burger, and **L. Alloatti**, "10Gb/s Intra-Chip Compact Electro-Optical Interconnect", OFC 2021
3. M. Eppenberger, D. Moor, A. Josten, B. Baeuerle, L. Benini, J. Leuthold, and **L. Alloatti**, "16 Gb/s Microring-to-Microring Photonic Link in 45 nm Monolithic Zero-Change CMOS," *Integr. Photonics Res. Silicon Nano Photonics IPR Top. Meet. OSA*, (2018)
4. **L. Alloatti**, "High-Speed Photonics for Side-by-Side Integration with Billion Transistor Circuits in Unmodified CMOS Processes," *J. Light. Technol.* **[invited]**, 35(6), 1168 (2017)
5. **L. Alloatti**, D. Cheian, and R. J. Ram, "High-speed modulator with interleaved junctions in zero-change CMOS photonics," *Applied Physics Letters*, 108 (13), 131101 (2016)
6. **L. Alloatti**, R. J. Ram, "Resonance-enhanced waveguide-coupled silicon-germanium detector," *Applied Physics Letters*, 108(7), 071105 (2016)
7. C. Sun, M. Wade, Y. Lee, J. Orcutt, **L. Alloatti**, et al., "Single-chip microprocessor that communicates directly using light," *Nature*, 528, 534 (2015)
8. **L. Alloatti**, V. Stojanovic, M. Popovic, and R. J. Ram, "High-Speed SiGe Photodetector in 45nm IBM 12SOI," *Applied Physics Letters*, 107(4), 041104 (2015)
9. **L. Alloatti**, C. Koos, J. Leuthold, "Optical loss by surface transfer doping in silicon waveguides," *Applied Physics Letters*, 107(3), 031107 (2015)
10. **L. Alloatti**, M. Wade, V. Stojanovic, M. Popovic, and R. J. Ram, "A photonics design tool for advanced CMOS nodes," *IET Optoelectronics Journal Special Issue for ECIO [invited]*, 9(4), 183 (2015)
11. **L. Alloatti**, C. Kieninger, A. Froelich, M. Lauermann, T. Frenzel, K. Koehnle, W. Freude, J. Leuthold, K. C. and M. Wegener, "Second-harmonic generation from atomic-scale ABC-type laminate optical metamaterials," *Applied Physics Letters* 107(12), 121903 (2015)
12. **L. Alloatti**, R. Palmer, S. Diebold, K. P. Pahl, B. Chen, R. Dinu, M. Fournier, J. M. Fedeli, T. Zwick, W. Freude, C. Koos, J. Leuthold, "100 GHz silicon-organic hybrid modulator," *Nature Light Science and Applications*, 3(5), e173 (2014)
13. A Melikyan, **L. Alloatti**, A Muslija, D Hillerkuss, PC Schindler, J Li, R Palmer, D Korn, S Muehlbrandt, Dries Van Thourhout, B Chen, R Dinu, M Sommer, C Koos, M Kohl, W Freude, J Leuthold, "High-speed plasmonic phase modulators," *Nature Photonics*, 8(3) 229 (2014)
14. **L. Alloatti**, M Lauermann, C Sürgers, C Koos, W Freude, J Leuthold, "Optical absorption in silicon layers in the presence of charge inversion/accumulation or ion implantation", *Applied Physics Letters*, 103(5), 051104 (2013)
15. **L. Alloatti**, D. Korn, C. Weimann, C. Koos, W. Freude, and J. Leuthold, "Second-order nonlinear silicon-organic hybrid waveguides," *Optics Express* **20**, 20506 (2012)
16. **L. Alloatti**, D. Korn, R. Palmer, D. Hillerkuss, J. Li, A. Barklund, R. Dinu, J. Wieland, M. Fournier, J. Fedeli, H. Yu, W. Bogaerts, P. Dumon, R. Baets, C. Koos, W. Freude, and J. Leuthold, "42.7 Gbit/s electro-optic modulator in silicon technology," *Optics Express* **19**, 11841 (2011)
17. **L. Alloatti**, "Anomalies and Anderson localization", *Journal of Physics C.*, 21(4), 045503 (2009)

Software repositories of supervised theses (git)

- Sebastian, Goeldi, “Photonic PCell Library” for KLayout.de , <https://sebastian-goeldi.github.io/KLayoutPhotonicPCells-core/index.html>
- Thomas Benz, “Spectre2Spice”, a converter to open standards for transistor compact models, <https://codeberg.org/thommythomaso/spectre2spice> , presented at the Free Silicon Conference 2019: https://wiki.f-si.org/index.php/Converting_45nm_transistor_netlists_to_open_standards
- Thomas Kramer, “Librecell”, a Standard-cell generator, <https://codeberg.org/tok/librecell>, presented at the Free Silicon Conference 2019: https://wiki.f-si.org/index.php/FOS_standard_cell_generator_from_scratch

Patents

- **L. Alloatti**, “Packaging of photonically interconnected chips”, U.S.A. 62/237775 (2015)
- **L. Alloatti**, D. Cheian, R. J. Ram, “Silicon-Germanium Photodiode in Zero-Change Advanced CMOS,” U.S.A. 62/186433 (2015)
- **L. Alloatti**, M. Wade, and R. J. Ram, "Photonic design automation tool," U.S.A. 63/092376 (2014).
- **L. Alloatti**, A. Froelich, C. Koos, S. Koeber, and M. Wegener, "Second-order optical nonlinear material," U.S.A. 14/559,216 (2014) and EU 13 005 623.7 (2013).
- **L. Alloatti**, J. Leuthold, W. Freude, K. C. D. Korn, and R. Palmer, "Electro-optical device and method for processing an optical signal," U.S.A. 13/460,395 and EP 11003562.3-1228 (2012).

Public invited talks

- **L. Alloatti**, “Photonic Design Automation Tools for Advanced CMOS Nodes – Towards a FOS Flow” <https://www.phiconference.com/photonic-integration-conference-2018/> High Tech Campus Eindhoven, The Netherlands (2018)
- **L. Alloatti**, “Integration of Photonics with Digital Processing Units”, SSDM, Japan (2017)
- **L. Alloatti**, “High-Speed Photonics for Side-by-Side Integration with Billion Transistor Circuits in Unmodified CMOS Processes, ECOC 2016, Gothenburg, Sweden (2016)
- **L. Alloatti**, “CMOS-compatible Second-order Nonlinear ABC Nanolaminates”, OSA Nonlinear Metamaterial Incubator, Washington DC, USA (09/2015)
- **L. Alloatti**, et al., "Second-order harmonic generation from atomic-scale ABC-type laminate optical metamaterials," Metamaterials, Metadevices, and Metasystems, SPIE Nanoscience+Engineering, 95440Y, San Diego, USA (2015).
- **L. Alloatti**, “Photonic design automation (PDA) tool for advanced CMOS nodes,” Microphotonics Center Spring Meeting 2015, Cambridge, USA (04/2015)
- **L. Alloatti**, et al., “Silicon-organic hybrid devices,” SPIE Opto, 86290P, San Francisco, USA (2013)

Other talks

- Over ten talks at European universities/institutes with expertise in chip design as part of the EU project “Go IT”.
- Over ten public talks or workshops at schools, associations and events in Switzerland about, privacy, digital self-defence, ethical software and decentralized services.

Date: 30/3/2024

Signature:

Luca Alloatti