



Nicholas Guesken

Postdoctoral Scholar, Materials Science and Engineering

Bio

BIO

Nicholas is a postdoctoral research fellow in Prof. Mark Brongersma's group at the Geballe Laboratory for Advanced Materials (GLAM), Stanford University.

His research is supported by a science fellowship from the German National Academy of Science - Leopoldina. His research interests include nanophotonics, optoelectronics, plasmonics, photonic integration, quantum photonics, nonlinear optics, photon-emitter interfaces, emission enhancement of quantum emitters, active metasurfaces, and phase change materials.

Nicholas is an experimental condensed matter physicist. After obtaining Master's degrees in Physics (RWTH Aachen) and Nanotechnology (Sorbonne), Nicholas began his Ph.D. at Imperial College London. During his Ph.D., he focused on light-matter interaction on the nanoscale, hot-carrier photodetection, and hybrid photonic-plasmonic waveguides. His supervisors were Prof. Stefan Maier and Prof. Rupert Oulton. He completed his Ph.D. in 2020, for which he was awarded the Imperial College Solid State Physics Thesis Prize 2020 for the best thesis. Shortly after, he joined a startup company in Switzerland working on the development of high-speed optical interconnects.

In 2021, he was awarded the competitive Science Fellowship from the German National Academy of Science - Leopoldina, which has been supporting his research at Stanford. At Stanford University, he works on active solid-state optical interfaces with two main research directions: i) quantum emitter control in integrated photonic networks and ii) reconfigurable beam steering in phase change material-based metasurfaces.

HONORS AND AWARDS

- Leopoldina Postdoctoral Fellowship, German National Academy of Science (2021)
- Imperial College Solid state thesis prize 2020, Imperial College London (2020)
- Deutschlandstipendium - Scholarship awarded for outstanding achievements in physics, Education Fund of the Federal Ministry 2016 of Education and Research Germany (2016)
- Listed on the Dean's List- Ranked in the upper 5% of the class out of 300 students in Economics., RWTH Aachen (2015)
- Deutschlandstipendium - Scholarship awarded for outstanding achievements in physics, Education Fund of the Federal Ministry of Education and Research Germany (2015)

PROFESSIONAL EDUCATION

- Master of Science, Rheinisch-Westfälische Technische Hochschule (2017)
- Master of Science, Rheinisch-Westfälische Technische Hochschule (2016)
- Bachelor of Science, Rheinisch-Westfälische Technische Hochschule (2023)
- Master of Science, Sorbonne Université (2015)

- Doctor of Philosophy, Imperial College of London (2020)
- PhD, Imperial College London , Experimental Solid State Physics (2020)
- MS, RWTH Aachen University , Physics (2016)
- MS, RWTH Aachen University , Economics (2016)
- MS, Sorbonne University - Paris IV , Materials Science & Nanotechnology (2015)
- BS, RWTH Aachen University , Physics (2013)

STANFORD ADVISORS

- Mark Brongersma, Postdoctoral Faculty Sponsor

PATENTS

- NA Güsken, JH Song, MY Lee, JZ Park, M. Brongersma. "United States Patent US Patent App. 63/602,488 Phase Change Metasurface for beam steering applications", Nov 1, 2023
- Nicholas Guesken, Alberto Lauri, Yi li. "United States Patent US20220209038A1 Schottky-barrier type infrared photodetector", Jun 30, 2022
- Nicholas Guesken, Florin Püntener, Wolfgang Heni. "Loss mitigation of plasmonic waveguides, application: PCT/EP2022/075251", Feb 1, 2022

LINKS

- LinkedIn: <https://www.linkedin.com/in/ng%C3%BCsken/>

Research & Scholarship

LAB AFFILIATIONS

- Mark Brongersma, Brongersma (10/4/2021)

Publications

PUBLICATIONS

- **Emission enhancement of erbium in a reverse nanofocusing waveguide.** *Nature communications*
Güsken, N. A., Fu, M., Zapf, M., Nielsen, M. P., Dichtl, P., Röder, R., Clark, A. S., Maier, S. A., Ronning, C., Oulton, R. F.
2023; 14 (1): 2719
- **Emission enhancement of erbium in a reverse nanofocusing waveguide** *Nature Communications*
Güsken, N. A., et al
2023; 14 (2719)
- **Near-unity Raman beta-factor of surface-enhanced Raman scattering in a waveguide.** *Nature nanotechnology*
Fu, M., Mota, M. P., Xiao, X., Jacassi, A., Gusken, N. A., Chen, Y., Xiao, H., Li, Y., Riaz, A., Maier, S. A., Oulton, R. F.
2022