Mario Tonin, PhD

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R&D PHOTONICS ENGINEER – SENIOR SCIENTIST

I am a seasoned photonics engineer specializing in lasers and micro-technologies. My expertise spans silicon photonics, laser processing, imaging, diffractive optics, and programming. With a curious and detail-oriented mindset, I excel in roles that demand patience, precision, innovative thinking and rigorous attention to detail. My career showcases a strong track record of complex problem-solving, where I have navigated challenging technical scenarios to drive project success. Thriving in multidisciplinary settings, I am adept at working both independently and collaboratively, consistently demonstrating the organization and motivation required to achieve challenging objectives.

STRENGTHS AND EXPERTISE

Optics and Photonics — Optical systems design | Femtosecond laser machining | Zemax

Micro and nano-fabrication — Photonic crystals | Microfluidics

Programming — Python | Rust | C++, MATLAB and Labview

PROFESSIONAL EXPERIENCE

Boegli Gravures SA **June 2016 - Present**
Senior Scientist - R&D Project Manager

Optical design & machine enhancement

- Designed optimized optical paths for custom-made laser engraving machines, achieving micron precision with femtosecond and picosecond lasers.
- Enhanced the efficiency of existing laser engraving machines, doubling their output.

Micro-Pattern Engraving

- Pioneered a process to engrave micro-patterns for flexography applications, achieving micrometer resolution and precise structure depths up to 2 microns on 1.5-meter rollers.

Project Management

- Spearheaded the development of multiple projects related to laser engraving devices, targeting new market opportunities.

Optical & Imaging systems

- Designed and assembled optical devices and imaging systems using off-the-shelf components, tailored for machine vision applications.

Software Development & Data management

- Programmed in Python and C++ for tasks including data analysis, image processing, scientific computing, process automation, and optical simulations.
- Developed custom software applications to support R&D and other departments.

Intellectual Property

- Authored five patent applications stemming from my innovations and work.

EPFL **September 2011 - December 2015**

Ph.D Student / Teaching Assistant

- Implemented optical trapping techniques within hollow photonic crystal cavities.
- Led the development, simulation, and fabrication of silicon photonic crystals.
- Designed and assembled a photonic force microscope from concept to completion.
- Oversaw the selection, procurement, and testing of scientific instruments to enhance laboratory capabilities.
- Served as the principal teaching assistant for both Bachelor's and Master's level courses in optics and physics.

EDUCATION AND QUALIFICATIONS

École Polytechnique Fédérale de Lausanne — 2015

PhD in Photonics - Optical trapping in photonic crystal cavities

Telecom Physics Strasbourg — 2011

Engineering Diploma in Physics - Specialty in Photonics

Strasbourg University — 2011

Master Diploma in Nanophotonics

LANGUAGES

French - *Mother tongue* **English -** *Fluent (C2)* **German -** *Working Proficiency (B2)*

PUBLICATIONS & PATENTS

Publications in peer-reviewed papers including Physical Review Letters, Lab-on-Chip, Applied Physics Letters and others

Full list available on my website in the « about me » section or on my LinkedIn profile

Patents published: WO 2023/119169 A1 — WO 2022/243917 A1 —- 3 patents pending

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PERSONAL DETAILS

Driving License: Full/Clean
Health: Excellent; Non-smoker