

Fritz Randulf Diorico, Ph.D.

Deep-Tech Physicist & Engineer — Quantum Technologies, Photonics, Ultra-Stable Lasers
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Profile

Experimental physicist and photonics engineer with 10+ years of experience designing, building, and commercializing advanced laser and quantum-sensing systems. Inventor on four international patents and project leader for a government-funded spin-off fellowship. Strong hands-on background in laser frequency stabilization, cavity systems, photonics hardware, and translating research into deployable prototypes.

Core Skills

Laser Physics • Frequency Stabilization • Photonics R&D • Quantum Sensing with cold atoms • Cavity Optics Precision Metrology • Experimental Design • Analog/RF Electronics • C/C++ • MATLAB • Python
Vacuum & Cryogenic Systems • Atomchip Platforms • System Integration & Prototyping

Selected Patents (Inventor)

- Method for monitoring an optical cavity signal — US20250070534A1 (2025)
- Laser-cavity stabilization system — WO2023118305 (Global PCT, 2023)
- Injection-locked laser control system — EP4336684A1 (2022)
- Modulation-free laser-cavity locking — EP4203206A1 (2021)

Professional Experience

Technical-Entrepreneurial Advisor & Co-Founder — Quantum Defense Innovation (QDI) 2025–Present
Remote (Canada / Europe / UAE)

- Provided technical judgment and startup execution guidance, leveraging prior government-funded spin-off leadership.
- Supported quantum-enhanced authentication and secure architecture efforts by shaping scope, assumptions, risk boundaries, positioning, and commercialization for industry/defense-safe deployment.

Spin-off Founder & Laser Technology Lead — Tulon Photonics / Future Lasers (FFG Fellowship) 2022–2024
Institute of Science and Technology Austria

- Led a ~€500k FFG Spin-off (Austria) Fellowship developing ultra-low-noise, widely tunable laser systems.
- Co-invented new cavity-locking and injection-locking techniques (now patented).
- Designed optical architectures, control electronics, and prototype systems for commercialization.

Postdoctoral Researcher — Quantum Sensing with Atoms & Light 2018–2022
IST Austria, Onur Hosten Group

- Built and stabilized high-finesse cavity systems achieving 10^{-7} cavity-linewidth-scale frequency stability.
- Co-invented advanced laser stabilization methods used in precision metrology.
- Mentored PhD and MSc students.

Research Assistant (PhD & Post-PhD) — Atomchip & Superconducting Hybrid Quantum Systems 2010–2018
TU Wien, J. Schmiedmayer Group

- Developed a cryogenic atomchip platform combining superconductors and ultracold atoms.
- Designed magnetic transport systems, vacuum hardware, and experimental control electronics.

BSF Fellow — Wilbe Science Founder Program 2023–Present
• Training in deep-tech commercialization, venture strategy, and technical leadership.

Education

Ph.D. in Physics (Dr.rer.nat., Highest Distinction) — TU Wien, Austria 2011–2016
Qualified for Austria's highest doctoral honor ("Sub auspiciis qualified"); CoQuS admission interview panel led by 2022 Nobel Laureate Anton Zeilinger.

Thesis: *Novel Atomchip Technologies with Superconductors*.

MSc Photonics (Erasmus Mundus Full Scholarship, Distinction) — Belgium & Scotland 2008–2010
Thesis: *Non-Abelian Atom Optics with Cold Atoms*.

BSc Applied Physics (Cum Laude) — University of San Carlos, Philippines 2003–2008

Publications & Additional

Publications in *Optica*, *Optics Letters*, *Applied Optics*, *PR Applied*, *PR Research*, *Applied Physics B*, *New Journal of Physics*, *SciPost*. H-index: 6; citations: 143 (Google Scholar). Fluent in English; conversational German. Machining/optics assembly; extensive mentoring experience.