



Rahul Chembra Vasudevan

PhD student – Diamond Photonics & Micro/Nanofabrication

Technical Skills

Lithography

Photolithography (contact & mask-less), E-beam (Raith ELPHY)

Thin Film Deposition

PECVD, Sputtering, E-beam evaporation

Plasma Etching

ICP-RIE, RIE

Material Platforms

Diamond, ZnS, SiN, SiO₂

Packaging & Bonding

Fiber packaging, membrane bonding, Wire bonding

Micromanipulation

Membrane transfer/handling, vacuum tools

Design & Simulation

KLayout, COMSOL, Python, MATLAB, Inkscape, Blender

Characterization

PL, ODMR, Rabi, AFM, SEM, Raman, Ellipsometry

Programming

MATLAB, Python

English

C1

French

B1

Education

2024 – Present

PhD, Photonics

INSA Rennes, University of Rennes

Integrated photonics for & NV-ensemble quantum sensing

Profile

PhD researcher in diamond integrated photonics with hands-on cleanroom expertise across lithography, thin-film deposition, and plasma etching of single-crystal diamond and dielectric platforms. Specialized in diamond micro/nanofabrication, membrane processing, custom device packaging and characterisation for quantum sensing and photonic applications. Seeking a photonics R&D or engineering roles applying clean room fabrication process development or optical characterization skills to industrial device manufacturing.

Experience

PhD Researcher | Diamond Integrated Photonics

Institut Foton, INSA Rennes, University of Rennes, France

2024 – Present

- Developed and documented nanofabrication, packaging and characterisation process for diamond integrated photonic platforms for the first time in the research institute;
- Successfully fabricated high-aspect-ratio 200 nm diameter pillars on NV diamond membranes for neuronal electrometry applications;
- Performed deep ICP-RIE of single-crystal diamond up to 30 μm , achieving repeatable microdisk fabrication and diamond cutting with 4 nm sidewall roughness;
- Developed room-temperature bonding solutions for diamond membranes, a novel concept in the diamond photonics field, suitable for all post-processing steps such as strong acid cleaning, high-temperature depositions, and polishing;
- Fabricated on-chip electrodes on diamond substrates and wire-bonded packaging for diamond electrometry devices;
- Designed and fabricated micrometer-scale (60 μm) diamond microdisks coupled to a multimode optical fiber of 125 μm cladding diameter. Developed packaging assemblies for a commercial fiber endoscope system, including custom mechanical mounts, fiber alignment tools, and a micromanipulation setup for precise and repeatable fabrication;
- Built from scratch an optical characterization setup (optics, equipment control, graphical interfacing, pulse sequencing, and data processing using Python) for coherent manipulation of NV spin states (PL, ODMR, Rabi oscillations, Ramsey, and spin echo measurements).

Master Thesis

Institut Foton, Lannion, University of Rennes, France

09/2022 – 06/2023

- Implemented quantum optics experimental setups for NV magnetometry; experimental demonstration of entangled photon pair generation and related measurements such as demonstration of violation of Bell's inequality, Hong-Ou-Mandel interferometry, and second-order correlation measurements.

Mitacs Globalink research fellow

TRIUMF Particle accelerator center, Vancouver, Canada

05/2022 – 07/2022

- Numerical Simulation of Multi-step laser ionization in order to simulate laser ionization from excited states of atoms (Rb, Na).
- Successful validation of simulations with experimental data from photoionization efficiency of ion beamline at the Isotope separator and accelerator center (ISAC), TRIUMF.

2022 – 2023

Exchange student, M2 Photonics,
Optical communication

University of Rennes

2018 – 2023

Integrated M.Sc., Photonics

Cochin University of Science and
Technology, University of Rennes

Interests

- ▶ Art
- ▶ Cooking
- ▶ Hiking
- ▶ Web designing

Contact

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in linkedin.com/in/raul

Industrial project student

Indian Institute of Technology, Kanpur, India

06/2021 – 08/2021

- Trained and developed machine learning models for biomedical applications: a classical ML pipeline for diabetes detection and a Convolutional Neural Network (CNN) for human iris classification

Research Internship

SOCIETY FOR SPACE EDUCATION RESEARCH
AND DEVELOPMENT (SSERD), Bengaluru, India

06/2021 – 07/2021

- Completed a research project on Corroborating the role of magnetic field on star formation via theoretical model and magnetohydrodynamics (MHD) simulations.

Publication

- R. Chembra Vasudevan, A. Hammouti, J. Le Pouliquen, T. Batte, P. Pirasteh, Y. Dumeige, P. Huillery (2026). Scalable fabrication of diamond-on-silica heterostructures via high-selectivity deep ICP-RIE and room-temperature bonding". Diamond and Related Materials, 168, 113992. doi.org/10.1016/j.diamond.2026.113992

Rennes, 5th August 2026

Rahul CHEMBRA VASUDEVAN