PhD scholarship in "Spatio-spectral alignment of quantum emitters to nanoelectromechanically tunable bowtie cavities"

Want to kick of your career with a PhD at the intersection between the start-up world as one of 15 PhD students in the EU-funded Marie Skłodowska-Curie Doctoral Network QUEST - Quantum Electrodynamics with Silicon Nanotechnology? In QUEST, we bring together leading European universities, research institutes and industrial partners working at the forefront of integrated quantum photonics, nanofabrication and quantum technologies. We offer an interdisciplinary training environment spanning nanophotonics, nanoelectromechanical systems, quantum optics, semiconductor nanofabrication, advanced characterization, quantum emitters and photonic integrated circuits.

For this PhD project, we are looking for an ambitious and bright student for a joint position with Lizard Photonics and DTU Electro. You will be employed by Lizard Photonics for 36 months and enrolled as a PhD student at DTU Electro. You will participate in QUEST network meetings, training schools, workshops, and international secondments with project partners.

You will join a multidisciplinary team with expertise in nanophotonics, silicon photonics, nanoelectromechanical systems (NEMS), semiconductor nanofabrication, and quantum optics. You will investigate photonic nanocavities embedded with quantum emitters and develop methodologies for efficient integration. We connect fundamental research with industrial technology development, giving you experience in both scientific discovery and translation towards applications. Your main academic supervisor will be Prof. Søren Stobbe at DTU Electro, and your industrial supervisor will be Dr. Ali Nawaz Babar at Lizard Photonics.

As a member of QUEST, Lizard Photonics and the Photonic Nanotechnology group at DTU Electro, you will work closely with colleagues specializing in nanofabrication and optical experiments. We emphasize strong collaboration between theory and experiment. Your project will be carried out jointly at Lizard Photonics and DTU Electro. You will complete two planned secondments: at Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany, to learn ion-implantation techniques, and at Max-Planck Institute (MPI), Göttingen, Germany, to probe quantum emitters using electron microscopy.

Responsibilities and tasks

In this PhD project, you will develop deterministic quantum light sources by combining lithographically aligned implantation of color centers with nanoelectromechanically tunable silicon bowtie nanocavities. You will investigate deep-subwavelength cavity designs and active NEMS tuning to spatially and spectrally align individual quantum emitters with cavity resonances. Together, we aim to establish a scalable building block for quantum communication, quantum computing, and integrated quantum photonics. You will be expected to primarily contribute to design, nanofabrication, and optical characterization. You will also contribute to outreach and dissemination, including public-engagement events, social-media communication and activities that promote science and innovation.

As part of the Danish PhD program, you will follow several PhD courses and take part in teaching as a teaching assistant. For the two secondments, you are expected to relocate to the project partners. There will also be regular meetings with the other 14 PhD students and partners in the doctoral network, including two training schools and two workshops.

Qualifications

We are looking for an engineer or physicist with an excellent academic record and, ideally, early evidence of scientific achievement. We value motivation, independence and demonstrated excellence in a Master's thesis involving nanophotonics, nanofabrication, numerical modelling or NEMS/MEMS. We also expect that:

- You are academically curious and think deeply and creatively.
- You take responsibility for the progress and quality of your work.
- You communicate clearly in written and spoken English.
- You are empathetic and enjoy collaborating with people from diverse backgrounds.

In addition to the formal degree requirement above, we prefer that you have a strong background in photonics, quantum optics, laser physics and numerical techniques. Your academic results should be in the top range, as only the strongest applicants are likely to be invited for an interview.

You must have a two-year master's degree (120 ECTS points) or a similar degree with an academic level equivalent to a two-year master's degree. Candidates with a strong background in photonics, quantum optics, laser physics and numerical techniques are preferred. Only candidates with a GPA belonging to the very top can expect to be called for interview.

Due to the mobility rules of the Marie Skłodowska-Curie program, you must not have resided or carried out your main activity (work, studies, etc.) in Denmark for more than 12 months in the 36 months immediately before the recruitment date.

Approval and Enrolment
The scholarship for the PhD degree is subject to academic approval, and the candidate will be enrolled in one of the general degree programmes at DTU. For information about our enrolment requirements and the general planning of the PhD study programme, please see DTU's rules for the PhD education.

Assessment
Prof. Søren Stobbe and Dr. Ali Nawaz Babar will assess the applications.

We offer
DTU is a leading technical university globally recognized for the excellence of its research, education, innovation and scientific advice. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Salary and appointment terms
You will be employed full-time by Lizard Photonics for 36 months and enrolled as a PhD student at DTU. The salary will be paid according to the MSCA Doctoral Network rules. Your appointment will comply with applicable Danish employment terms and the MSCA Doctoral Network rules. Your remuneration package will reflect the applicable MSCA living and mobility allowances, and a family allowance will be provided where you meet the MSCA eligibility conditions. We expect you to start on 1 January 2027 or as mutually agreed.

You can read more about career paths at DTU here.

Further information
Further information may be obtained from Prof. Søren Stobbe (ssto@dtu.dk) and Dr. Ali Nawaz Babar (babar@lizardphotonics.com)

You can read more about QUEST at https://quest.dtu.dk, about Lizard Photonics at https://lizardphotonics.com, and about DTU Electro at https://electro.dtu.dk.

You may find useful information on working in Denmark and at DTU at DTU – Moving to Denmark. Furthermore, you have the option of joining our monthly free seminar "PhD relocation to Denmark and startup "Zoom" seminar" for all questions regarding the practical matters of moving to Denmark and working as a PhD at DTU.

Application procedure
Your complete application must be submitted to info@lizardphotonics.com no later than 01 November 2026 (23:59 Danish time).

Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, please open the link "Apply now", fill out the online application form, and attach **all your materials in English in one PDF file**. The file must include:

- A letter motivating the application (cover letter)

- Curriculum vitae
- Grade transcripts and BSc/MSc diploma (in English) including official description of grading scale

You may apply prior to obtaining your master's degree but cannot begin before having received it.

Applications received after the deadline will not be considered.

All interested candidates, irrespective of age, gender, disability, race, religion, or ethnic background, are encouraged to apply. As DTU works with research in critical technology, which is subject to special rules for security and export control, open-source background checks may be conducted on qualified candidates for the position.

We recruit in accordance with the European Code of Conduct for Recruitment of Researchers, which we encourage you to study.

Lizard Photonics
Lizard Photonics is a deep-tech spin-off from DTU developing ultra-low-power, highly efficient silicon photonic technologies for optical interconnects, quantum technologies, and next-generation computing. We combine expertise in NEMS, nanophotonics, nanofabrication, and photonic integration to translate frontier research into scalable technology. As part of our team, you will work in an entrepreneurial environment where scientific insight and industrial development are closely connected. See more on Lizard Photonics.

DTU Electro
DTU Electro has more than 300 employees with competencies in electrical and photonics engineering. Research is performed within nanophotonics, lasers, quantum photonics, optical sensors, LEDs, photovoltaics, ultra-high speed optical transmission systems, bio-photonics, acoustics, power electronics, robotics, and autonomous systems. See more on DTU Electro.

DTU – For the benefit of society since 1829
DTU is one of Europe's leading elite technical universities. Through research and education at an international top level, we create solutions to the major societal challenges of our time and help secure Europe's global leadership in sustainable technological development. Since Hans Christian Ørsted founded DTU almost 200 years ago, our mission has remained the same: We develop and create value through the natural and technical sciences for the benefit of society. DTU has 13,800 students, 1,600 PhD students, and 6,500 employees. We work in an international environment and have an inclusive, stimulating, and informal work culture. DTU has campuses in all parts of Denmark and in Greenland and collaborates with the best universities around the world. See more in DTU.