

JOB OFFER: POSTDOC POSITIONS IN INTEGRATED QUANTUM KEY DISTRIBUTION

Ghent University – IMEC
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Context

The Photonics Research Group has been granted funding for advancing the future deployment of quantum key distribution (QKD). Nanophotonics and heterogeneous integration constitute two strengths of the photonics research group that are ideal for up scaling the fabrication of QKD transmitters and receivers. This position is focused on measurement device independent QKD transmitters [1] and more advanced all-optical circuits acting as quantum repeaters [2,3].

Job description

The candidate will be responsible for the research work including design, modelling, and complete characterization of the quantum ICs. The candidate will work together with and provide guidance to a small team of PhD-students working in the same project.

Responsibilities include:

- Performing research in an independent way
- Reporting on the research to supervisor and collaborators
- Communication to peers at conference and via journal publications

Profile

- At the starting time of the contract, the applicant must hold a PhD in physics, physics engineering or photonics engineering.
- Good knowledge of optics and/or quantum information.
- Active, hands-on experience with quantum photonics is highly recommended. Deep theoretical understanding of what is and is not feasible in quantum photonics is a major plus.
- Proficient level in English

Benefits

Benefits include mandatory health insurance, laptop, travel to conferences.

About the Photonics Research Group

The project will take place primarily at the University of Ghent in the photonics research group (PRG). PRG has pioneered the field of integrated photonics and keeps on enriching that technology, especially using integration of other materials and functionalities. It hosts a fully equipped measurement infrastructure (single photon detectors, higher power lasers, cryostat, ...), a cleanroom facility, and an extensive simulation infrastructure. The group is also an

affiliated lab of IMEC: one of the world leading research institutions in microelectronics. The photonics research group hosts 12 professors, 15 postdocs and 50+ PhD students of many nationalities.

Application

The positions are open at the date of publication and evaluations are performed as they are received. To apply, submit to Stéphane Clemmen by email:

- your CV
- a cover letter highlighting your research interest, the expertise you already have and the one you currently miss for this project

For more information, please contact

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Prof. Stéphane Clemmen (stephane.clemmen@UGent.be)

<http://www.photonics.intec.ugent.be/>

References

- [1] Lo, Hoi-Kwong, Marcos Curty, and Bing Qi. "Measurement-device-independent quantum key distribution." *Physical review letters* 108.13 (2012): 130503 ; Liu, Yang, et al. "Experimental measurement-device-independent quantum key distribution." *Physical review letters* 111.13 (2013): 130502.
- [2] Li, Zheng-Da, et al. "Experimental quantum repeater without quantum memory." *Nature photonics* 13.9 (2019): 644-648.
- [3] Srinivasan, Srinivasan Ashwyn, et al. "27 GHz silicon-contacted waveguide-coupled Ge/Si avalanche photodiode." *Journal of Lightwave Technology* 38.11 (2020): 3044-3050; Cuyvers, Stijn, et al. "Heterogeneous integration of Si photodiodes on silicon nitride for near-visible light detection." *Optics Letters* 47.4 (2022): 937-940.