CASE STUDY

Institute of Photonics (IOP)

Leibniz University of Hannover, Germany

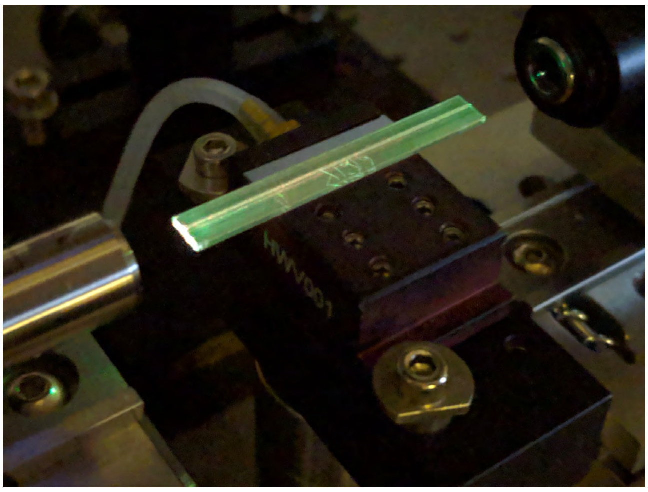
The Institute of Photonics at Leibniz University of Hannover, Germany specialize in the investigation and development of novel, scalable and compact photonic quantum systems based on fiber and integrated optical circuit technology. They work at the intersection of laser physics, non-linear optics, quantum science and information processing with the aim to enable quantum technologies in real world scenarios.

Area of Research

Muhamed Sewidan, Research Assistant at The Institute of Photonics, is conducting research centred on quantum photonic technology, with a particular emphasis on developing a cutting-edge, integrated quantum light source. The project aims to bolster the security and efficiency of quantum communication networks.

Quantum encryption is becoming increasingly essential in the modern digital world due to the growing number of cyber threats. Traditional encryption techniques, which rely on complex mathematical algorithms, are at risk of being broken by powerful quantum computers in the near future. Quantum encryption, particularly through quantum key distribution (QKD), offers a fundamentally secure method of communication by leveraging the principles of quantum mechanics.

The team at the Leibniz University of Hannover aims to build an integrated and efficient quantum light source designed to be implemented in future QKD networks.



Lensed launch testing

The use of Covesion PPLN technology

To support their research, Muhamed recently acquired a 30mm MgO:PPLN waveguide from Covesion, selected specifically to maximize conversion efficiency. The waveguide plays a pivotal role in their project by providing a high-rate photon pair source via Spontaneous Parametric Down Conversion (SPDC), essential for the development of QKD quantum networks.

The team are currently evaluating the waveguides temporal and spectral correlations to compare it with their own fabricated components and to assess its potential for future integration into their quantum light source as their aim is to produce a packaged quantum light source, containing the waveguide, which has the potential to be embedded in QKD quantum networks in the future.

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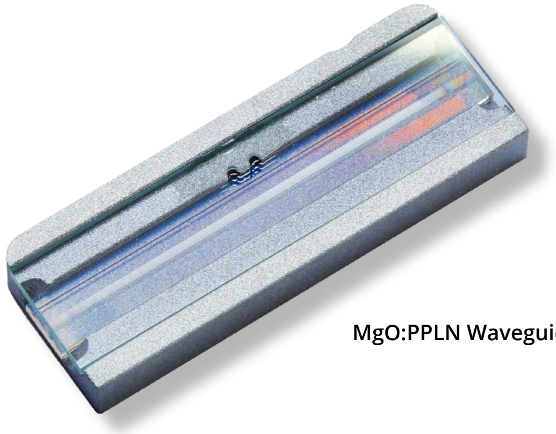
Why Covesion?

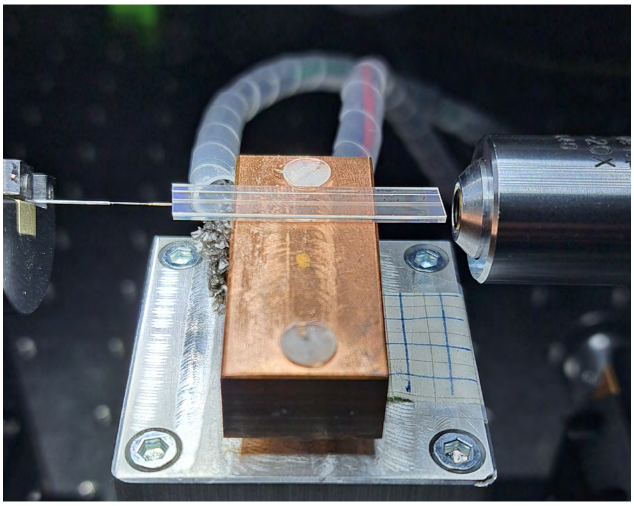
Muhamed's decision to select Covesion's product was influenced by their previous positive experiences with Covesion's offerings and the suitability of the products for their current needs. Covesion's reputation for high quality components aligned perfectly with the project requirements.

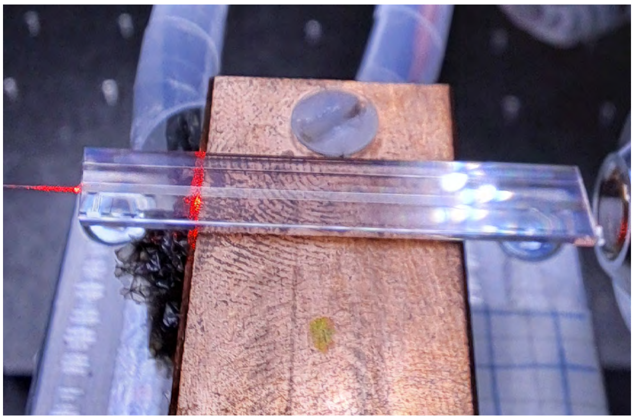


MgO:PPLN Waveguide

"We wanted to commend the outstanding customer service provided by Lewis Smith from Covesion. His expertise and support were invaluable throughout our engagement. Lewis addressed all our queries with patience and clarity, demonstrating a high level of professionalism and dedication. His commitment to ensuring a positive customer experience was evident, and we are extremely satisfied with the service provided. We would highly recommend Covesion's customer service team to others for their exceptional support."

Muhamed Sewidan
Research Assistant, The Institute of Photonics,
Leibniz University of Hannover





Above: Waveguide being characterised in the labs

In summary, the integration of Covesion's advanced waveguide into the research being conducted at the Leibniz University of Hannover underscores the importance of reliable and innovative components in the advancement of quantum communication technologies.

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About us

Covesion are world leaders in the research, development and manufacture of MgO:PPLN crystals and waveguides for highly efficient, non-linear frequency conversion. With over 20 years' experience in the manufacture of PPLN technologies for the photonics industry, experts at Covesion are well equipped to provide insight and guidance on the design of systems for generating visible and IR light.

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