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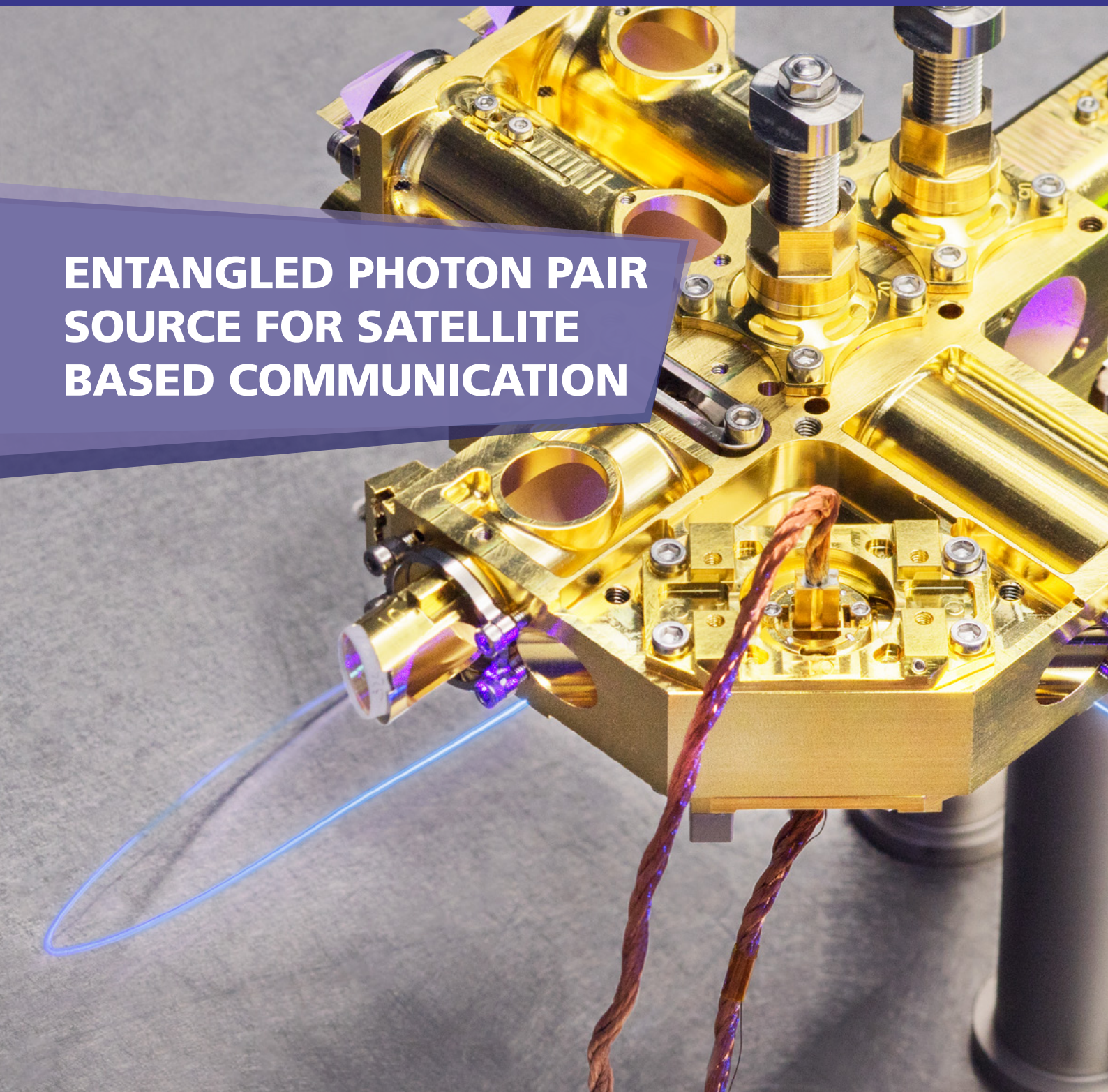
DEVICES FOR QUANTUM COMMUNICATION



ENTANGLED PHOTON PAIR SOURCE FOR SATELLITE BASED COMMUNICATION

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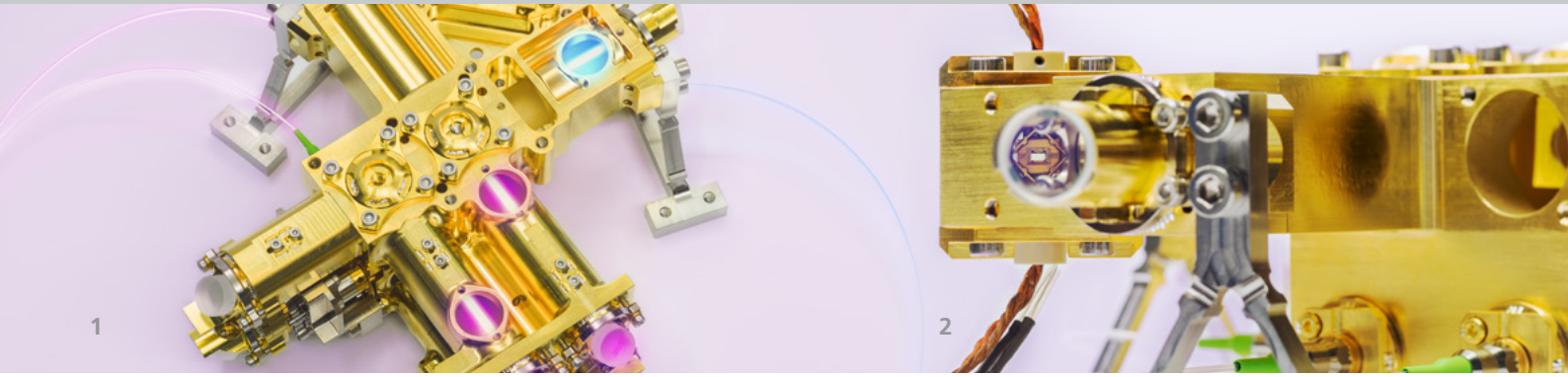

1 *EPS – Entangled photon pair source.*
2 *View inside the periodically poled KTP crystal, which is elementary for the creation of stable and bright polarization entangled photon pairs.*

ENTANGLED PHOTON PAIR SOURCE FOR SATELLITE BASED QUANTUM COMMUNICATION

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The trend towards rapid, digital communication is continuing. Even security-sensitive areas such as production facilities want to benefit from the advantages of fast information exchange. Therefore, a secure communication is essential. The communication via elemental particles might be the solution. Experts from the Fraunhofer IOF have developed an entangled photon pair source for safe quantum communication, based on a satellite network.

By using pairs of polarisation entangled photons a physically tamper-proof communication can be achieved. From the source, one photon of the entangled pair is sent to one communication partner and the second photon is sent to the other one. Interception or manipulation at one point would cause the state of both photons to change at the same time. This change indicates that a third party is attempting to obtain information illegally and enables an immediate response.

To generate the photon pairs a non-linear, periodically poled KTP crystal is coherently pumped from two sides in a sagnac geometry using up to 8 mW pumping power at 405 nm. The down conversion in the crystal generates polarization entangled photons. The efficiency of this fiber-coupled source is up to 300.000 pairs per second.

Depending on the area of application, we offer our customers individually flexible solutions. In the field of quantum communication, this ranges from space-capable high-performance sources for entangled photons, to complete photonic system solutions based on adaptive optics, to lightweight telescopes for space and ground systems.