OGS-Jena (Optical Ground Station Jena)

OGS Jena is an urban optical ground station designed as a testbed for satellite-to-ground optical links. It hosts an 80 cm Ritchey–Chrétien telescope providing two Nasmyth ports and a Coudé focus relayed to a Coudé laboratory beneath the mount. Both beam paths are equipped with active tip–tilt and adaptive optics to improve beam stabilization and enhance coupling efficiency into optical fibers. Uplink transmission can be implemented co-axially through the main telescope or via a boresighted parallel transmit aperture.

OGS on Fraunhofer IOF Rooftop

A: Brief Information

Testbed Title	OGS-Jena (Optical Ground Station Jena)
Location	Fraunhofer IOF (Rooftop)
Institution/Organization	Fraunhofer IOF
Contact	Dr. Matthias Goy, Matthias.Goy@iof.fraunhofer.de
	Prof. Dr. Fabian Steinlechner, Fabian.Steinlechner@iof.fraunhofer.de
Status	planned

OGS Coude Laboratory

B: Technical Information

Type of Transmission	optical ground station
Length [km]	-
Losses [dB]	-
Supported Wavelengths [nm]	700 - 1600 nm
Type of Fiber	coupling to SM and MM
Type of Deployment	combined
Polarization Stabilization	No
Free aperture (e.g. 80 cm) (for OGS)	800mm telescope, free aperture unknow yet
Quantum Communication Infrastructure	
Available Infrastructure for external Parties	

C: Additional Information

Linked Projects	• QuNET: https://qunet-initiative.de • QuNET+SKALE: https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qunet-skale • CubEniK: https://www.iof.fraunhofer.de/de/presse-medien/pressemitteilungen/2024/CubEnik.html • QUDICE: https://qudice.eu/
Press Release and Publications	• Mini satellite wants to take quantum communication to space, 03.2024 • Making Europe fit for quantum communication via satellite09.2023 • QuNET initiative: One step closer to highly secure quantum communication, 07.2023 • QuNET - secure, quantum-based communication networks
Demonstrated Milestone	• Results of first demonstrations will be available in mid-2026
Outlook	• We plan to upgrade the OGS Jena so that it can meet all interface requirements for the EAGLE-1 mission and thus become part of a European OGS network.
Suggested Use Cases	• Quantum Communication • Classical Laser Communication
Other Comments/ Information	