

OHB System AG
Andrea Jaime
11.11.2020



OHB System – Quantum Comms & QKD

EPIC Online Technology Meeting on Quantum Communication & Quantum Key Distribution



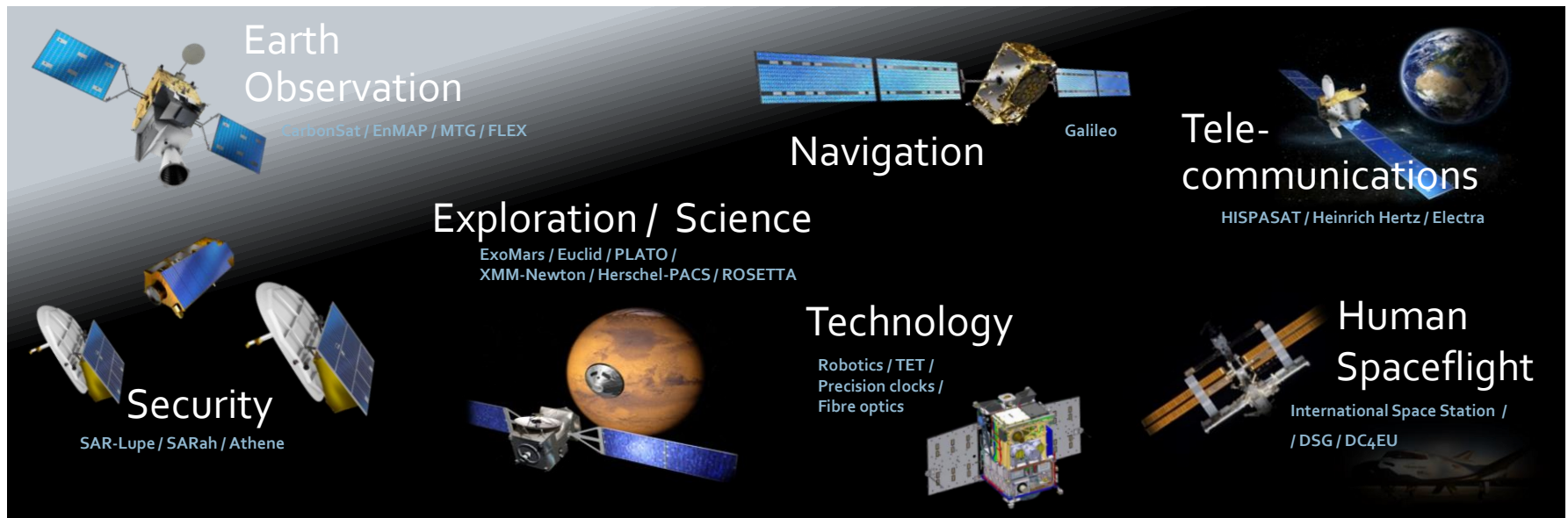
"As a 'start-up with experience of life', we are able to address the established markets and respond swiftly and agile to new challenges."

Marco R. Fuchs, Chief Executive Officer of OHB SE



Business Activities

- Entire scope of space domains



- Complete range of project management, from small-scale payloads and missions to large-scale satellite and space infra-structures

OHB Quantum Technologies Vision & Goal

*OHB has been established as a **major systems partner** in the realization of quantum technology systems aiming to transfer European research into the technology of tomorrow.*

Quantum Technologies Working Group (QTWG) est'd mid 2016

Optical atomic clock and frequency comb technologies are being studied **since 2009** as core technology in Munich within **Predevelopment**.

In 2016, the **Quantum Working Group** was established with the support from **Systems Engineering, Predevelopment** and **Business Development**.



Currently assigned topics:

1. **Quantum Key Distribution** space based
2. **Cold Atom Sensors**
3. Optical **Atomic Space Clocks** and Optical **Frequency Combs**
4. **Quantum Computing**

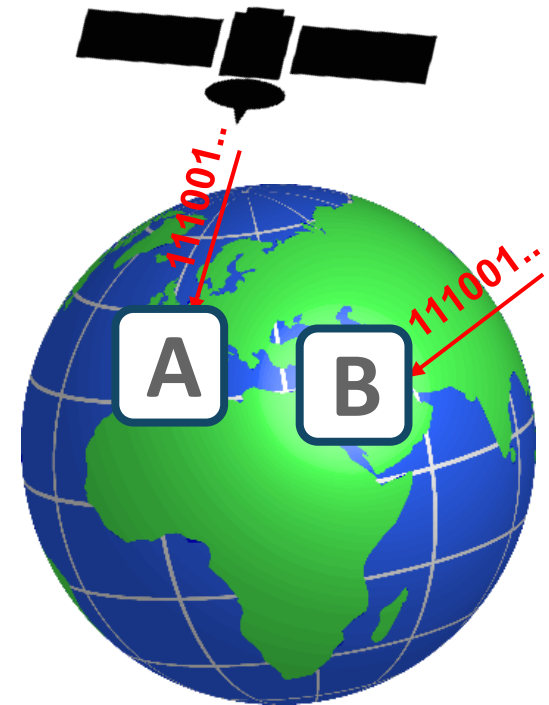


Besides the current core team there are **more than twenty** employees in Munich with background in quantum optical research.

Space Quantum Communications & QKD

Why Space?

- QKD sensitive to loss:
 - quantum states can not be amplified
 - fibre based length limitation to few hundred km
 - the existing fibre infrastructure is not suitable
- Space Based:
 - loss reduction
 - key exchange with varying, distant ground stations
- connection of nodes of (future) quantum networks
 - step towards a „quantum internet“
 - long-haul links between metropolitan quantum networks



Technology was recently proven (China & Austria) & China launched its first Quantum satellite in 2016 (and intends to launch 10 more)

Quantum Communications on-going programmes (1/2)



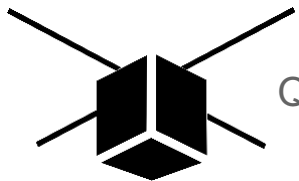
EC study in collaboration with **Thales, TASF, AIT, SES**

- Objective: Define System/User Requirements and Overall Architecture (incl. space component) for a **European Quantum Communication Infrastructure**



ESA study, together with **UniBwM, IABG, MPL, evolutionQ** – finished end 2019

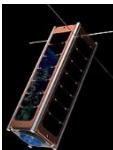
- Objective: use of optical comm/QKD for securing European critical infrastructure



QUBE

with **LMU, MPI for Science of Light, IKN, ZFT & Tesat** – launch in **2021**

- pilot project within QUTEGA, program on national level
- QKD/QRNG Technology development/maturation on Cubesats
- OHb contribution to industrialization of photonic integrated QRNG



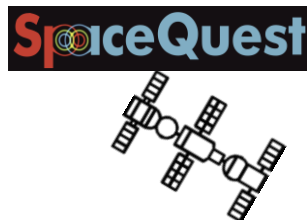
Quantum Communications on-going programmes (2/2)



- National initiative – pilot network for quantum comm. - **FHG/MPG/DLR IKN**.
- OHB member of advisory board, contribution in next phases in negotiation



- H2020-funded, **AIT**-led initiative on QKD testbeds and use cases
- QKD maturation and integration into existing security and networks
 - OHB member of advisory board & security board



- ESA Phase A/B study, with **Uni Waterloo & DLR IKN** – PDR collocation ongoing
- Observation of a relativistic quantum effect, QKD secondary science objective.
 - Design of a polarization-resolved single photon detector aboard ISS & optical tracking

Quantum Communications & QKD

What can we do for you?

- Exchange ideas on business opportunities within space systems
- Provide some guidance on how space telecommunications projects work
 - Systems Requirements Definition, PA, etc...
- Potentially become a partner or a customer

What can you do for us?

- Inform us about the latest news on the technologies you are developing that could be included in a space quantum communications network
- Actively tell us how you think your technology can be incorporated into the space systems, and the benefits of it
- Be our provider or partner

THANK YOU!

Andrea Jaime Albalat, Business Development Manager
Andrea.Jaime@ohb.de



OHb



@OHb_SE

www.ohb.de



@OHb_SE



OHb