Press Release

Secure satellite communication – Berlin team wins INNOspace Masters 2019/20

Berlin, October 15, 2020

The winners of the INNOspace Masters competition, which is organized by the German Aerospace Center (DLR), have been announced: On 14 October, a Berlin-based team from Technische Universität, Humboldt-Universität and the Ferdinand-Braun-Institut won the DLR Challenge. This prize supports projects with up to 400,000 euros. Moreover, the winning project "QuMSeC" was chosen as overall winner of the INNOSpace Masters 2019/20.

The Berlin project was selected from 117 submitted ideas and deals with tap-proof quantum communication, which is supposed to work in the future even with untrusted satellites. The winning team includes Dr. Markus Krutzik, who heads the Joint Lab Integrated Quantum Sensors at Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH), which is jointly operated by FBH and Humboldt-Universität zu Berlin. The idea for the award-winning project was developed together with Dr. Mustafa Gündogan from the Joint Lab and Prof. Janik Wolters from the work group Physical Foundations of IT Security at the DLR Institute for Optical Sensor Systems, Technische Universität Berlin, and the Einstein Center Digital Future.

Secure Satellite Communications - QuMSeC

The joint project aims at using quantum memories to set new standards for secure quantum key distribution (QKD), also for untrusted satellites. Up to now, the necessary cyber security in QKD-based approaches has been based on complete control over development and manufacture as well as launch and operation of the satellites. In the future, customers and users should benefit from secure data communication via satellites even without having access to an own satellite infrastructure.

With a turnover of 156.3 billion US$[1], satellite communication is a key player in the global digital economy with strategic importance for state and society. Internet, television, telephony and communication in aviation and shipping rely on highly secure satellite communication networks. However, the encryption methods used in data transmission today are vulnerable. This poses considerable security risks for critical infrastructures in the energy, telecommunications and transport sectors, for example. Tap-proof quantum communication should therefore provide a remedy.

The press picture is available here for download. All images are copyrighted.

[1] Global Space Economy 2018 (Source: Bryce Space and Technology, 2020)

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About the FBH

The Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik (FBH) researches electronic and optical components, modules and systems based on compound semiconductors. These devices are key enablers that address the needs of today's society in fields like communications, energy, health, and mobility. Specifically, FBH develops light sources from the visible to the ultra-violet spectral range: high-power diode lasers with excellent beam quality, UV light sources and hybrid laser systems. Applications range from medical technology, high-precision metrology, and sensors to optical communications in space and integrated quantum technology. In the field of microwaves, FBH develops high-efficiency multi-functional power amplifiers, and millimeter wave frontends targeting energy-efficient mobile communications as well as car safety systems. The FBH has a strong international reputation and ensures rapid transfer of technology by working closely with partners in industry and research. The institute has a staff of 315 employees and a budget of 40.4 million euros. It is part of the Forschungsverbund Berlin e.V., a member of the Leibniz Association and part of »Research Fab Microelectronics Germany«.

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