



QuSCo - Quantum-enhanced Sensing via Quantum Control

Quantum technologies aim to exploit quantum coherence and entanglement, the two essential elements of quantum physics. Successful implementation of quantum technologies faces the challenge to preserve the relevant nonclassical features at the level of device operation. It is thus deeply linked to the ability to control open quantum systems. The currently closest to market quantum technologies are quantum communication and quantum sensing. The latter holds the promise of reaching unprecedented sensitivity, with the potential to revolutionize medical imaging or structure determination in biology or the controlled construction of novel quantum materials. Quantum control manipulates dynamical processes at the atomic or molecular scale by means of specially tailored external electromagnetic fields. The purpose of QuSCo is to demonstrate the enabling capability of quantum control for quantum sensing and quantum measurement, advancing this field by systematic use of quantum control methods. QuSCo will establish quantum control as a vital part for progress in quantum technologies.

QuSCo will expose its students, at the same time, to fundamental questions of quantum mechanics and practical issues of specific applications. Albeit challenging, this reflects our view of the best possible training that the field of quantum technologies can offer. Training in scientific skills is based on the demonstrated tradition of excellence in research of the consortium. It will be complemented by training in communication and commercialization. The latter builds on strong industry participation whereas the former existing expertise on visualization and gamification and combines it with more traditional means of outreach to realize target audience specific public engagement strategies.

UNIPD Team Leader: Simone Montangero

Department: Department of Physics and Astronomy

Coordinator: Freie Universität Berlin (Germany)

Other participants:

Aarhus Universitet (Denmark)

Centre National de la Recherche Scientifique (France)

Commissariat à l'énergie atomique et aux énergies alternatives (France)

IBM Research GmbH (Switzerland)

Institut national de recherche en informatique et en automatique (France)

NVision Imaging Technologies GmbH (Germany)

Technologie-Transfer-Initiative GmbH der Universität Stuttgart (Germany)

Technische Universität München (Germany)

Technische Universität Wien (Austria)

Universität des Saarlandes (Germany)

Universität Ulm (Germany)

Thales (France)

Communauté d'universités et d'établissements université Bourgogne-Franche-Comté (France)

Università degli Studi di Padova (Italy)

Forschungszentrum Jülich GmbH (Germany)

Universität Kassel (Germany)

Technische Universität Kaiserslautern (Germany)

Total EU Contribution: Euro 3.881.934,98

Call ID: H2020-MSCA-ITN-2017

Project Duration in months: 48

Start Date: 01/11/2017

End Date: 31/10/2021

Find out more: <https://cordis.europa.eu/project/id/765267>