Schweizerische Eidgenossenschaft
Confédération suisse
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Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Swiss National Science Foundation

Quantum Transitional Call – Granted projects

Holograph

Corresponding applicant: **Brantut Jean-Philippe (EPFL)**

Further Applicants: **Hauke Philipp (non-CH, Italy), Esslinger Tilman (ETHZ), Sonner Julian (GE)**

Keywords: **Holographic duality; Quantum optics; Quantum simulation; Strongly correlated matter**

Project duration: **01/09/2023 - 31/08/2027** Granted Amount: **2'732'492 CHF**

Quantum Communication Networks: Quantum Encryption & Repeaters

Corresponding applicant: **Brunner Nicolas (GE)**

Further Applicants: **Afzelius Mikael (GE), Thew Robert (GE), Tittel Wolfgang (GE)**

Project Partners: **Bussières Félix (GE), Haack Géraldine (GE), Zbinden Hugo (GE), Sekatski Pavel (GE)**

Keywords: **Quantum cryptography; Quantum communications; Quantum networks**

Project duration: **01/04/2023 - 31/03/2027** Granted Amount: **3'248'395 CHF**

Quantum Metrology with Multi-Functional Spin Probes

Corresponding applicant: **Degen Christian (ETHZ)**

Project Partners: **Puebla Hellmann Gabriel (QZabre AG), Knittel Peter (non-CH, Germany), Gambardella Pietro (ETHZ), Trassin Morgan (ETHZ), Nesladek Milos (non-CH, Belgium)**

Keywords: **Solid-state spin defect; Diamond NV center; Scanning probe microscopy; Quantum Metrology; Multifunctional sensing; Quantum Sensing**

Project duration: **01/09/2023 - 31/08/2027** Granted Amount: **714'668 CHF**

Hybrid Quantum-Classical Algorithms for gate based simulations: analysis of electron-phonon systems and quantum enhanced NMR inference

Corresponding applicant: **Demler Eugene A. (ETHZ)**

Project Partners: **Bloch Immanuel (non-CH, Germany), Neupert Titus (ZH), Zoller Peter (non-CH, Austria), Cirac J. Ignacio (non-CH, Germany)**

Keywords: **NMR; Hybrid; phonon**

Project duration: **01/10/2023 - 30/09/2027** Granted Amount: **723'154 CHF**

Spin-orbit control in a triangular ring of hole spin qubits

Corresponding applicant: **Fuhrer Andreas (IBM)**

Further Applicants: **Salis Gian (ZH)**

Keywords: **Quantum technology; Spin orbit interaction; Quantum computing; Spin qubits; Coherence; Shuttling; Germanium; Hole spin qubits; Analog Quantum Simulation**

Project duration: **01/05/2023 - 30/04/2027** Granted Amount: **838'164 CHF**

Scalable and noise-robust quantum simulation algorithms for near-term hardware

Corresponding applicant: **Holmes Zoe (EPFL)**

Further Applicants: **Woerner Stefan (IBM), Zoufal Christa (IBM)**

Keywords: **NISQ; Error-mitigation; Quantum simulation; Quantum algorithms**

Project duration: **01/04/2023 - 31/03/2027** Granted Amount: **889'127 CHF**

Graphene quantum dot qubits

Corresponding applicant: **Ihn Thomas (ETHZ)**

Further Applicants: **Hofmann Andrea (BS)**

Keywords: **Bilayer Graphene; Spin-Orbit Interaction; Quantum Dot Qubit Experiments; Electronic Transport Measurements**

Project duration: **01/04/2023 - 31/03/2027** Granted Amount: **1'287'736 CHF**

MicrowavE-optical TRansductIon for superconducting Quantum computing (METRIQ)

Corresponding applicant: **Kippenberg Tobias Jan (EPFL)**

Keywords: **Cavity electro-optics; Quantum computing; Superconducting circuits; Cavity optomechanics; Microwave-optical transduction**

Project duration: **01/05/2023 - 30/04/2026** Granted Amount: **704'013 CHF**

Novel, ensemble-based Quantum Sensors (EnsQSens)

Corresponding applicant: **Maletinsky Patrick (BS)**

Further Applicants: **Haesler Jacques (CSEM), Grassani Davide (CSEM)**

Project Partners: **Achard Jocelyn (non-CH, France)**

Keywords: **Quantum sensing; Solid state physics; Gyroscopy; Scanning probe microscopy; Spin Physics; Entanglement; Spin Ensembles; Thermal imaging; Diamond; Quantum optics**

Project duration: **01/09/2023 - 31/08/2027** Granted Amount: **1'580'581 CHF**

Small-scale quantum processor from partially-protected superconducting qubits

Corresponding applicant: **Manucharyan Vladimir (EPFL)**

Keywords: **Circuit quantum electrodynamics; Quantum processor; Decoherence; High-fidelity operations; Two-qubit gates; Superconducting qubit**

Project duration: **01/09/2023 - 31/08/2027** Granted Amount: **1'012'384 CHF**

Quantum Sensing Beyond the Standard Quantum Limit with Levitated Nanoparticles

Corresponding applicant: **Novotny Lukas (ETHZ)**

Keywords: **Optical Trapping; Quantum Correlations; Optomechanics; Quantum Sensing; Levitodynamics**

Project duration: **01/07/2023 - 30/06/2027** Granted Amount: **743'639 CHF**

Superconducting circuit engineering using scanning SQUID microscopy (SuperSQUID)

Corresponding applicant: **Poggio Martino (BS)**

Keywords: **scanning SQUID microscopy; scanning probe microscopy; quantum computing hardware; superconducting circuits; superconducting qubits; SQUID**

Project duration: **01/12/2023 - 30/11/2027** Granted Amount: **996’699 CHF**

Superconducting Cavity Arrays for Analog Quantum Simulation

Corresponding applicant: **Scarlino Pasquale (EPFL)**

Further Applicants: **Savona Vincenzo (EPFL)**

Project Partners: **Chang Darrick (non-CH, Spain), Minganti Fabrizio (EPFL), Gasparinetti Simone (non-CH, Sweden), Veldhorst Menno (non-CH, Netherlands)**

Keywords: **Microwave Metamaterials; Quantum Simulation; Cavity Quantum Electrodynamics; Superconducting Resonator; Superconducting Qubits; Open Quantum Systems; Many-Body**

Project duration: **01/06/2023 - 31/05/2027** Granted Amount: **1’184’272 CHF**

(GATE2Q) Gallium phosphide transducers enabling optical two-qubit entanglement

Corresponding applicant: **Seidler Paul F. (IBM)**

Keywords: **gallium phosphide; optical; optomechanics; quantum; transduction; microwave; integrated**

Project duration: **01/05/2023 - 30/04/2026** Granted Amount: **671’538 CHF**

Scalable high bandwidth quantum network

Corresponding applicant: **Treutlein Philipp (BS)**

Further Applicants: **Warburton Richard (BS)**

Project Partners: **Haesler Jacques (CSEM), Grassani Davide (CSEM)**

Keywords: **Quantum network; Atomic vapor cells; Semiconductor quantum dots; Single-photon sources; Nonlinear optics; Quantum memory**

Project duration: **01/09/2023 - 31/08/2027** Granted Amount: **1’650’699 CHF**

Modular Quantum Computing with Superconducting Circuits (ModQC)

Corresponding applicant: **Wallraff Andreas (ETHZ)**

Keywords: **Quantum Computing; Modular Computing; Quantum Entanglement; Nanotechnology; Superconductivity**

Project duration: **01/04/2023 - 31/03/2027** Granted Amount: **1’892’003 CHF**
