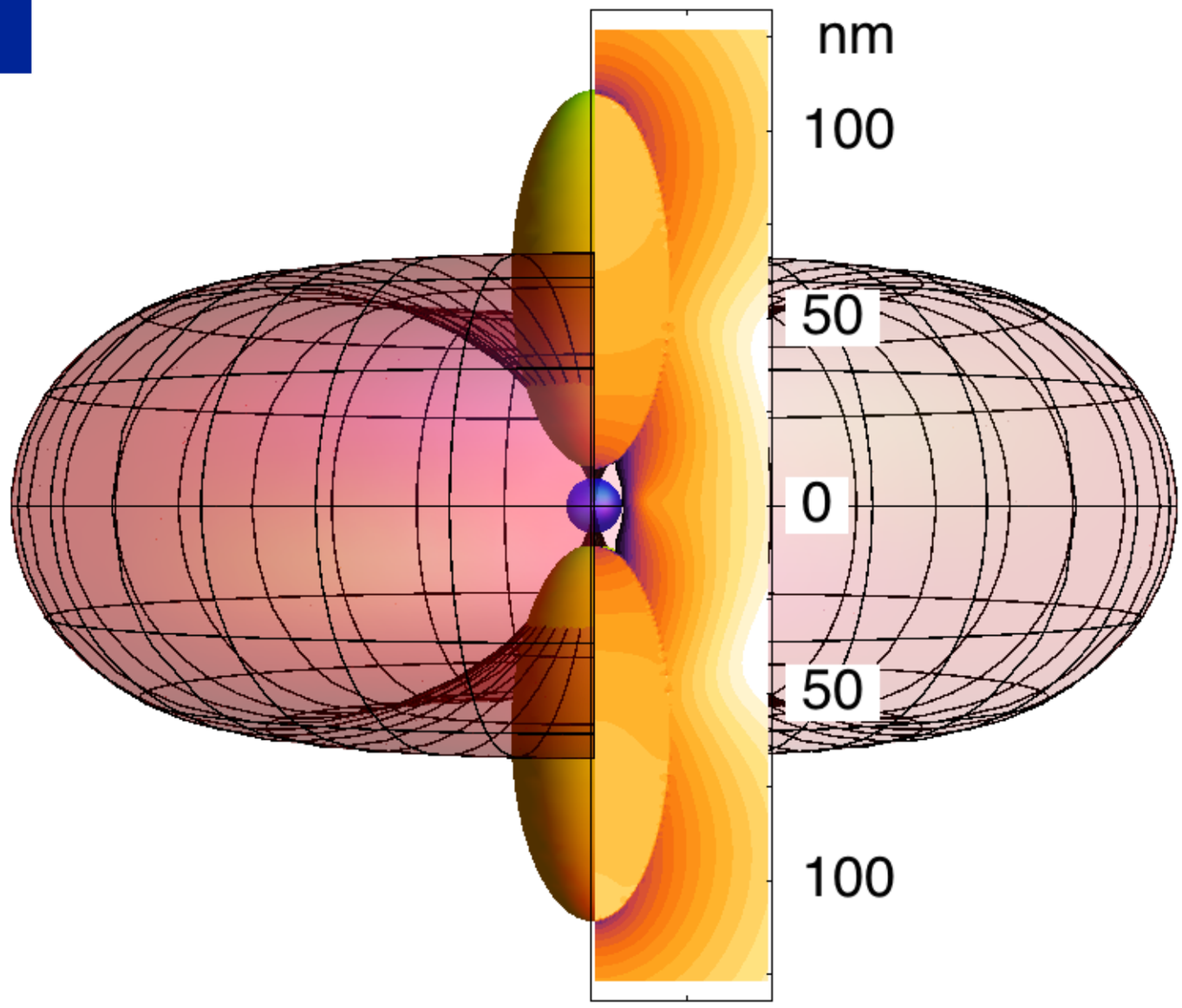
cost
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY



Nanoscale Quantum Optics

COST Action MP1403 — www.cost-NQO.eu

Focus and Aims

- The investigation of **quantum phenomena in nanophotonics systems**
    - Starting point for developing **photonic technologies that deliver quantum-enhanced performances** in real-world situations
- Support and coordinate research activities in **nanoscale quantum optics**
    - Cross-links between **quantum science & technology, nanoscale optics & photonics and materials science**
    - Facilitate the early-involvement of **end-users**

Facts and Figures

- Start 2.12.2014 - End 30.4.2019
- **28 COST Countries (12 Inclusiveness Target Countries)**
- 3 COST Near-Neighbor Countries, 9 COST International Partner Countries, ESA
- 52 MC members, 16 Core Group members
- **~ 600 members organized in 4 Working Groups (WGs)**
- **18% female, 38% early-career investigators**
- ~ 500 attendees to COST events
- **~ 600 000 EUR spent (~ 1000 EUR per person)**
- Topical events (~ 30), publications & patents, short-term scientific missions (~ 100), conference grants (~ 15), startups (~ 10), several invited speakers & lecturers from US, Canada and Australia

COST Action NQO - Scientific Focus

- **WG1**: Generation, detection & storage of quantum states of light at the nanoscale

- **WG2**: Nonlinearities & ultrafast processes in nanostructured media

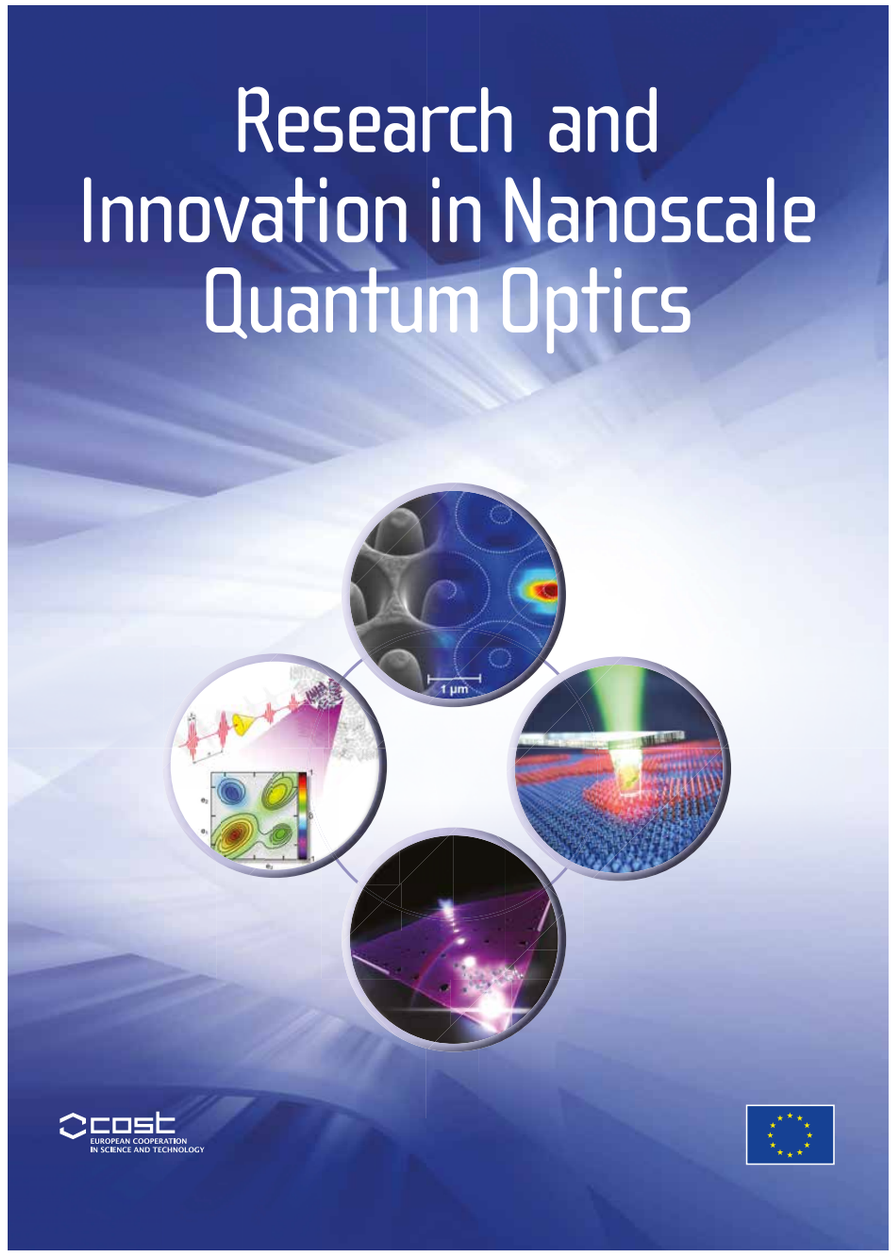
- **WG3**: Nanoscale quantum coherence

- **WG4**: Cooperative effects, correlations and many-body physics tailored by strongly confined optical fields

- **Applications: ICT, sensing & metrology, energy efficiency**

The NQO Roadmap

- Shaped during Action's meetings and other networking events
- **Structure of the NQO Roadmap:**
  - Executive summary
  - Presentation of the COST Action NQO
  - 4 working-group scientific areas
    - Research topics
  - Technological outlook
- **Available for download at: www.cost-nqo.eu/support/documents/**



Technological Outlook

- **Several companies have emerged or have expanded their activities in the field of NQO**
- **Quantum Photonic Devices and Systems:**
  - Single-photon sources
  - Single-photon detectors
  - Photonic integration
  - Single-spin sensing
- **Enabling technologies:**
  - Software
  - Lasers
  - High-speed electronics
  - Cryogenics
- **COST Action NQO industry partners at www.cost-nqo.eu/industry**

Market Research Study in NQO

- Present the innovation potential of the field in a quantitative manner
- Short-term: **5 years** with insights for long-term market
- In **cooperation with Tematys**, a photonics market research company
- Cooperation between **industry members** of the COST Action NQO, other relevant industry in the value chain, stakeholders
- The MRS focuses on:
  - **Quantum Sensing, Imaging and Measurement Systems**
  - **Quantum Communications**
- **The MRS will be an open access document for decision makers in the private and public sector, available at www.cost-nqo.eu/support/documents/**

International School of Physics "Enrico Fermi"

Course 204

Nanoscale Quantum Optics

23 - 28 July 2018