

Call 2017



RouTe

Towards Room Temperature
Quantum Technologies

*Cyriaque GENET, University of Strasbourg
France*



MAX-PLANCK-GESELLSCHAFT



IBM Research | Zurich



SUCCESS STORY (highlights)



CHALLENGE – operating quantum technologies at room temperature for real-world applications



SOLUTION – the enabling physical system: organic materials: quantum properties at RT, multi-level light-matter coupling



PLANNED AND SURPRISING/UNPLANNED OUTCOMES – optimized performances on-chip nano-waveguides / RT-BEC in plasmonic lattices / vacuum dressed site-selectivity of chemical reactions / RT 700x enh. ferromagnetism

IMPACT (RRI aspects)



OPEN SCIENCE:

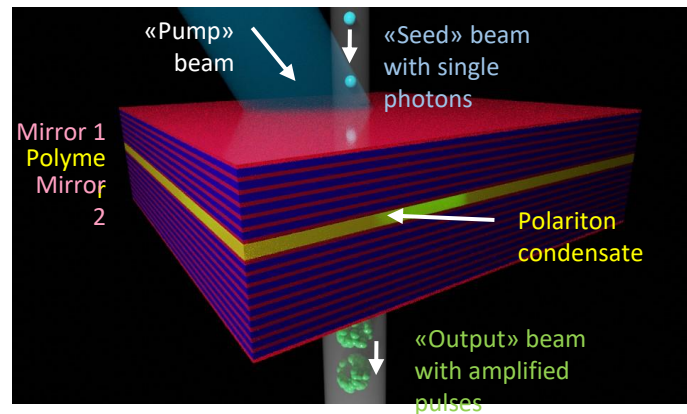
- all publications have been placed in arXiv.org and open access journals have been used whenever appropriate
- generated data have been uploaded on open-access repositories (NOMAD, MPG e.g.)
- open source softwares: adding electrodyn. eqs and QEDFT in Octopus



PUBLIC ENGAGEMENT: all RouTe PIs have given general public lectures on light-matter interactions. Coordinator (P.1) has initiated/prolongated discussions with policy makers and industries

IMPACT (potential users)

RouTe: enhancing the robustness and scalability of quantum information technologies in the presence of environmental decoherence



P.4 (IBM, Zürich) All-optical transistor using seeded polaritons: demonstration of single-photon non-linearities
Nature 597, 493 (2021)

Patent « Tuning emission wavelengths of quantum emitters via phase change materials » USPTO filing 06/2021 – IBM-Z et al.



RELEVANT INDUSTRY BRANCH: optoelectronics



KEY COMMERCIALY RELEVANT APPLICATIONS:

RT single photon sources



QUANTERA

ERA-NET Cofund in Quantum Technologies



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