THALES
Building a future we can all trust

Projet Marie S. Curie «MOCCA» at TRT

Alfredo de Rossi
Laboratoire de Micro et Nano Technologies
Thales Research and Technology, FRANCE

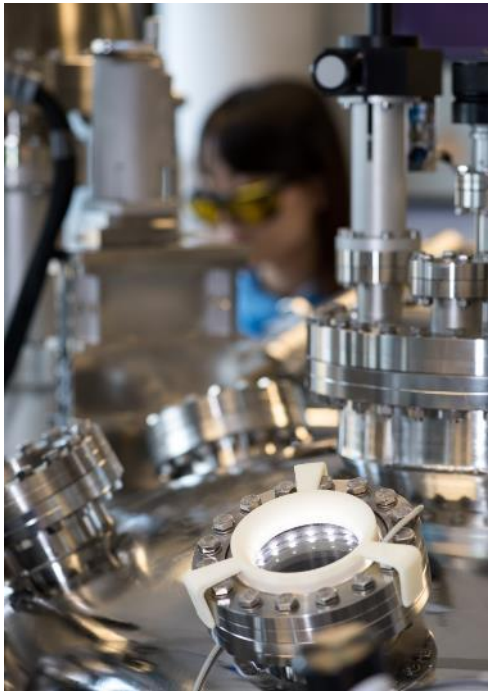
TRT France Labs : Physics

Aims

- Identification of technological breakthroughs which can impact future business of Thales
- Development of corresponding key technologies (advanced materials, devices and concepts)

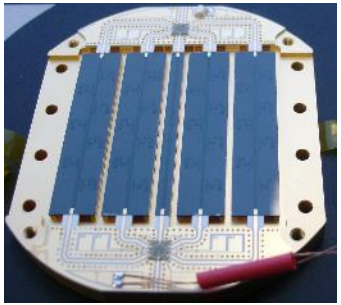
Key drivers

- Establish strong links with academia to master key technologies
- Implement functional demonstrators jointly developed with Thales divisions
- Front end innovations based on applied research
- System level SWAP (Size, Weight And Power)



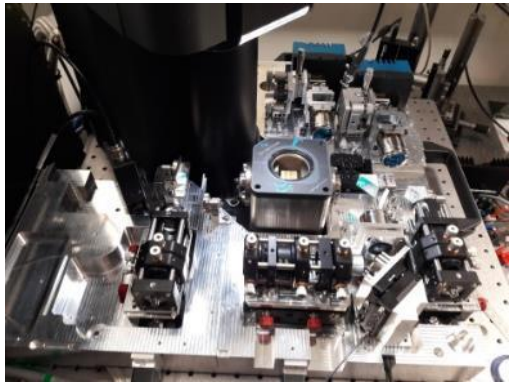
TRT France Labs : Physics

Research topic examples

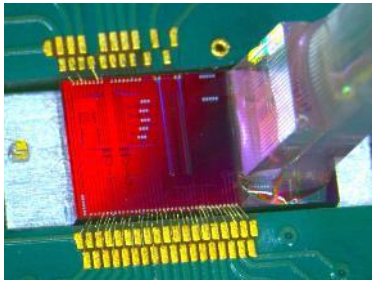


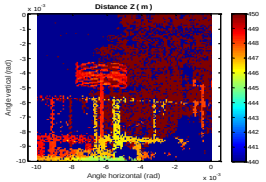
High resolution microwave signal processing using superconducting technologies

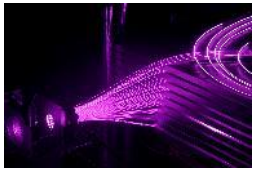
Ultra-compact X-ray sources using nanomaterials (CNTs)



Quantum-based ultimate RF spectrum analysis with 100 % P.O.I







Photonic Integrated Circuits is a multipurpose breakthrough : coherent lidar, RF processing, high power lasers, gyros, hydrophones,…

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MOCCA: Multiscale optical frequency combs: advanced technologies and applications

The Nobel Prize in Physics 2005

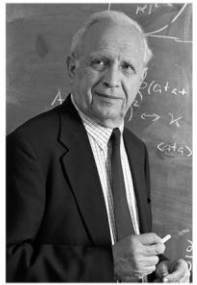


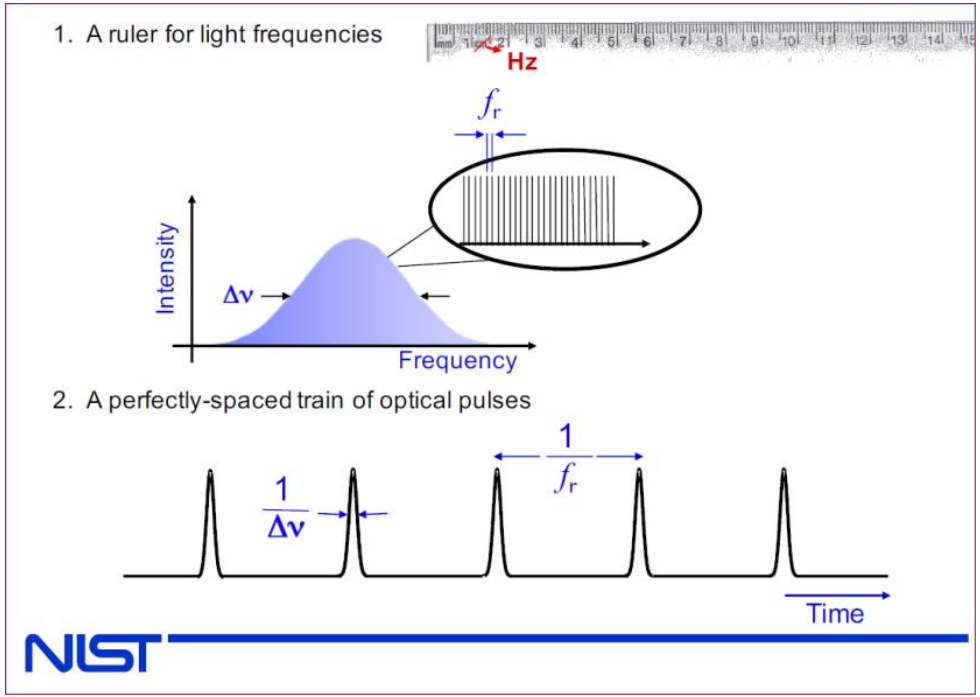
Photo: J.Reed
Roy J. Glauber
Prize share: 1/2

Photo: Sears.P.Studio
John L. Hall
Prize share: 1/4

Photo: F.M. Schmidt
Theodor W. Hänsch
Prize share: 1/4

The Nobel Prize in Physics 2005 was divided, one half awarded to Roy J. Glauber "for his contribution to the quantum theory of optical coherence", the other half jointly to John L. Hall and Theodor W. Hänsch "for their contributions to the development of laser-based precision spectroscopy, including the optical frequency comb technique."

To cite this section
MLA style: The Nobel Prize in Physics 2005. NobelPrize.org. Nobel Prize Outreach AB 2022. Fri. 17 Jun 2022. <https://www.nobelprize.org/prizes/physics/2005/summary/>



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MOCCA: Multiscale optical frequency combs: advanced technologies and applications

Beneficiaries:

- Aston University (UK)
- Sapienza Università di Roma (Italy)
- CNRS-C2N (France)
- THALES SA (France),
- AMO GmbH (Germany)

Partner Organisations:

- III-V Lab (France)
- RWTH Aachen University (Germany)
- Univ. Paris Diderot (France)

European Industrial Doctorate

- 4 early-stage researchers (ESRs)
- world-class advanced training programme to prepare the next generation of leaders in the field of photonics.
- unique combination of "hands-on" research training, non-academic placements and advanced inter/multidisciplinary/inter-sectoral training
- scientific skills (nonlinear optics and laser physics, micro- and nano-technologies)
- transferable skills

MOCCA

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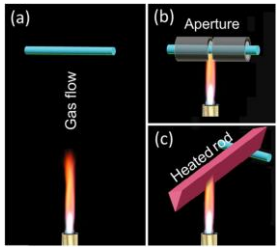
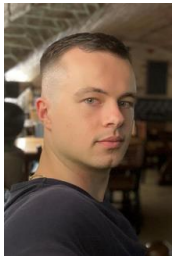
Research

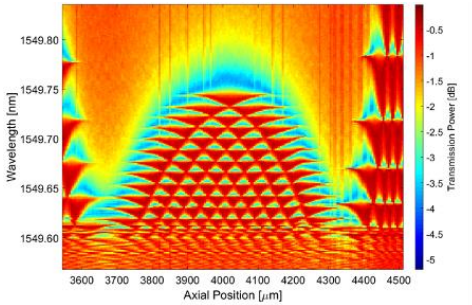
ESR 1: Victor Vassiliev

Heat induced SNAP resonators

Aston University
Birmingham

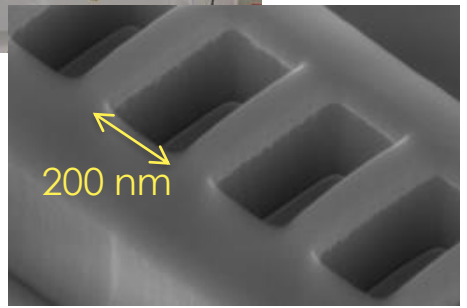






ESR 2: Loredana Maria Massaro

Nonlinear nanophotonic III-V semiconductor on Si platform for frequency comb generation



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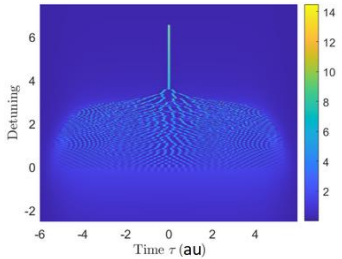
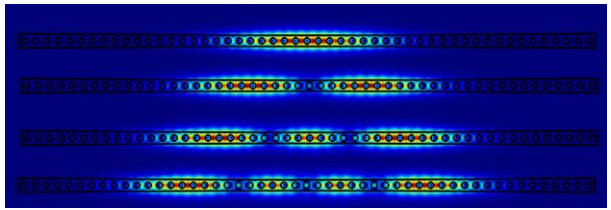
Research

ESR 3: Francesco Rinaldo Talenti

Theoretical modelling the build-up and evolution of the fields in microresonators and active cavities

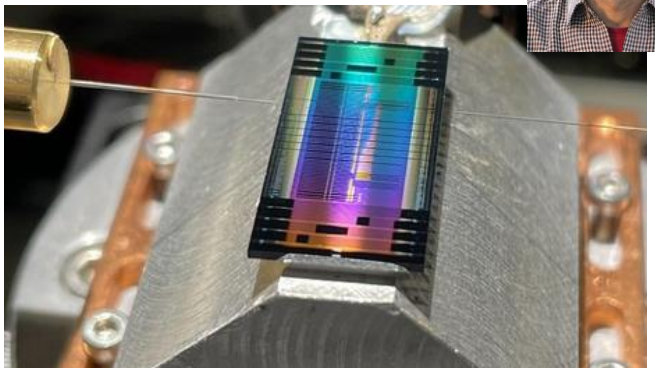




SAPIENZA
UNIVERSITÀ DI ROMA

ESR 4: Avinash Kumar

Generating Higher Harmonics in Silicon Nitride (Si3N4)



AMO

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