

Fuentes de fotones individuales plug&play

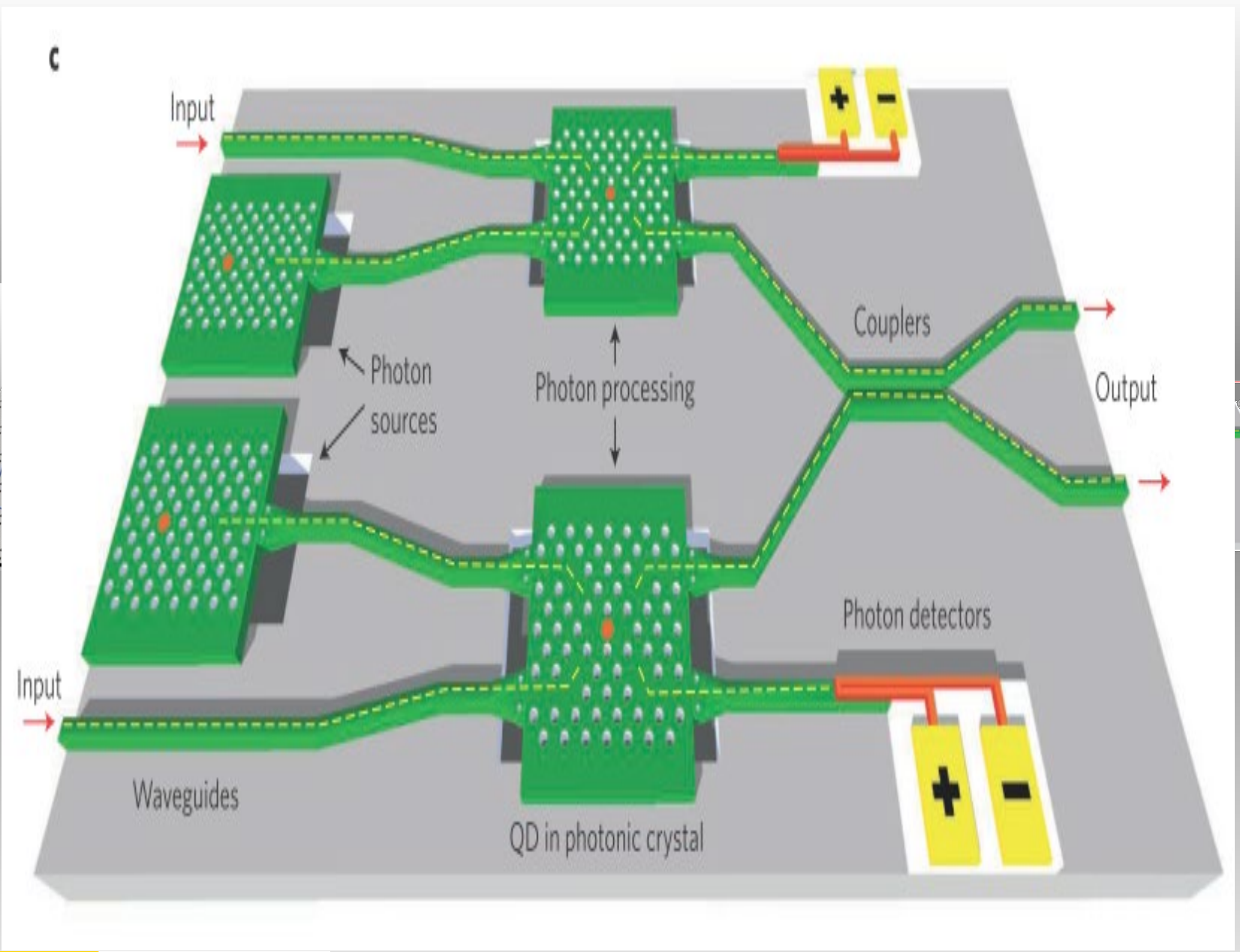
Benito Alén

Instituto de Micro y NanoTecnología IMN-CSIC,
Tres Cantos, Spain

Requisitos:

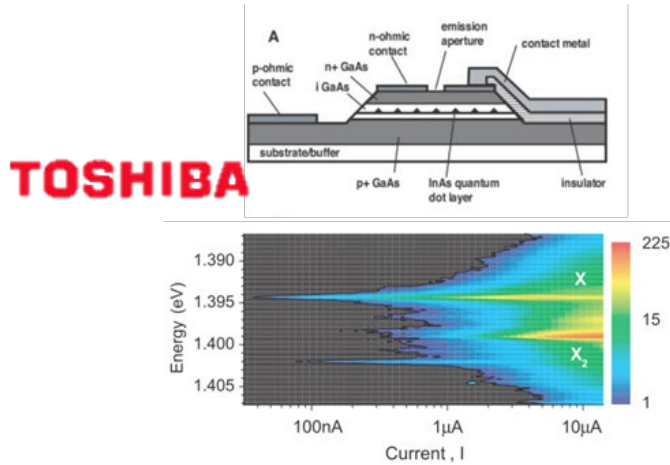
1. Inyección eléctrica I/V
2. Sintonizable λ
3. Integrable en PIC

(2016)

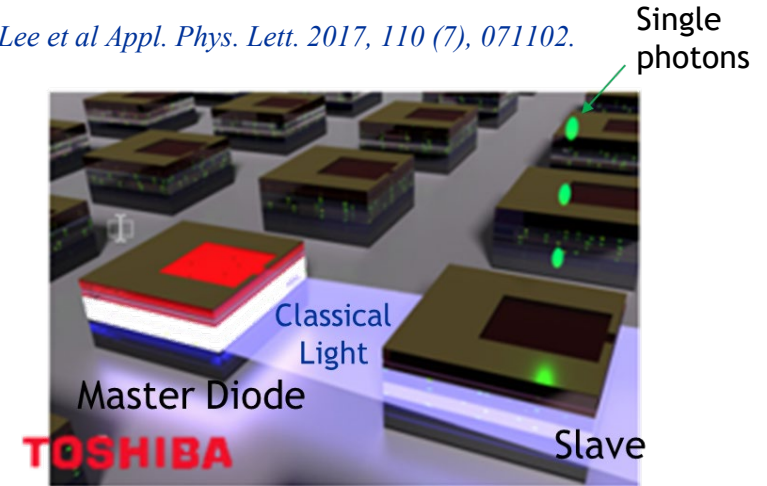


QLED Background

Z. Yuan et al *Science* 295, 102 (2002)



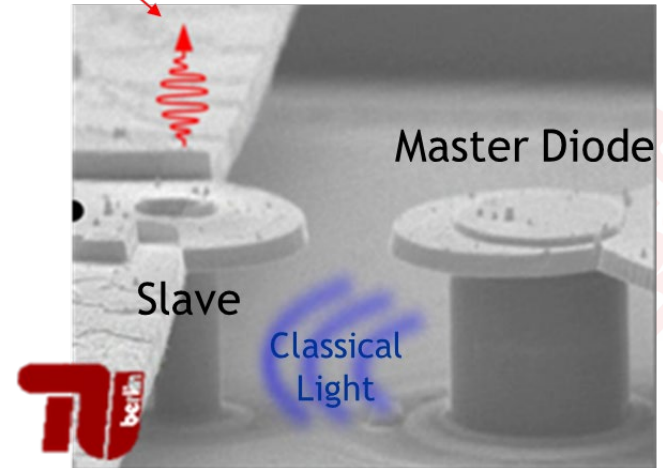
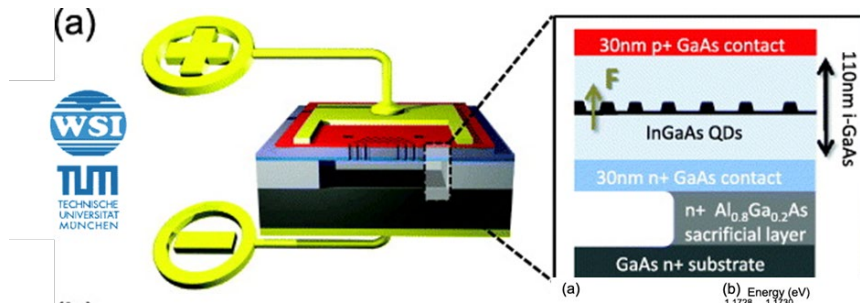
J. P. Lee et al *Appl. Phys. Lett.* 2017, 110 (7), 071102.



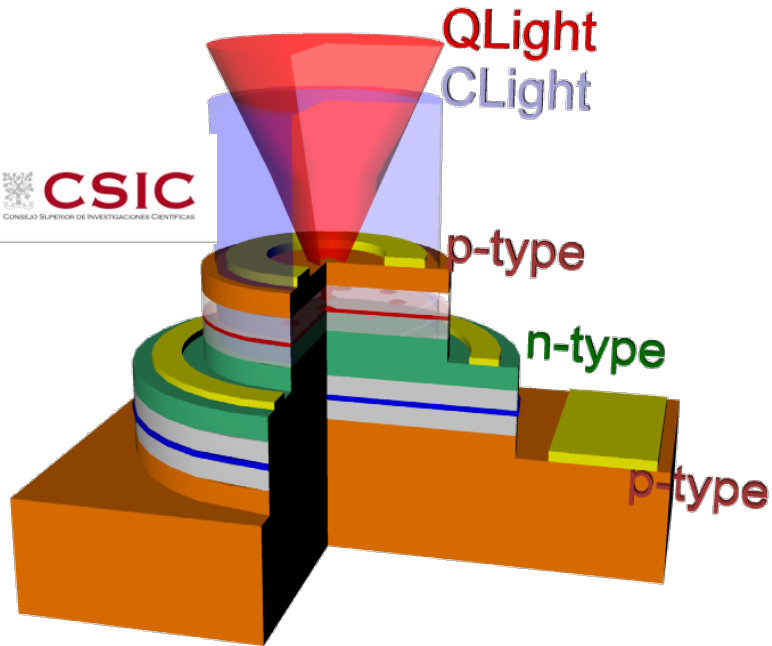
P. Munnely et al *ACS Photonics* 2017, 4 (4), 790–794.

Single photons

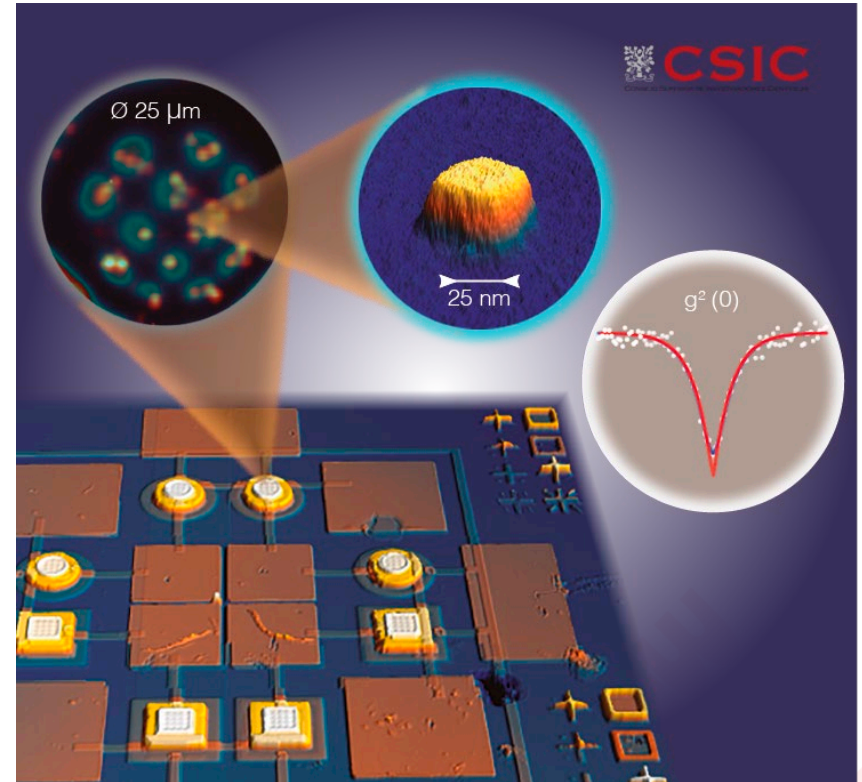
A. Laucht et al *New J. Phys.* 2009, 11 (2), 023034



Our Solution



B. Alén et al. Patent Application EP3361516A1 (2017)



Mineico Explora Tecnología
Proyecto MONO-QLIGHT (2017)

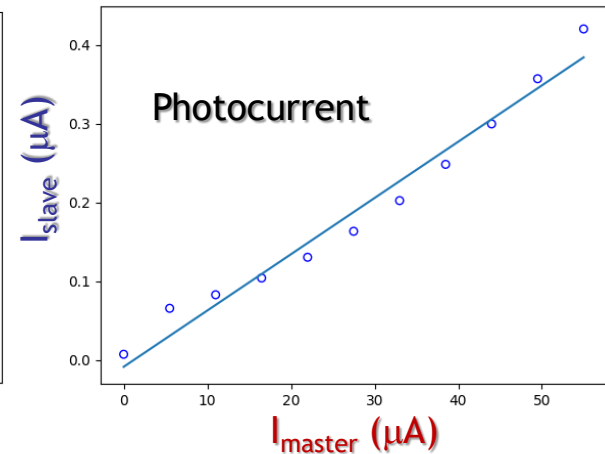
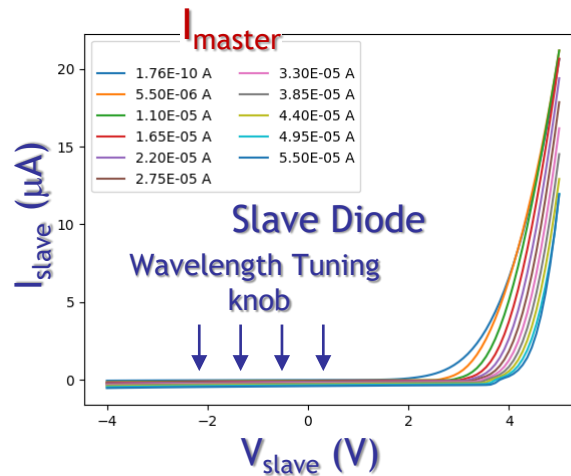
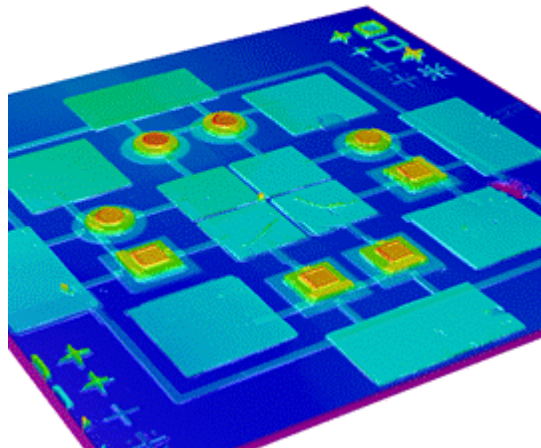
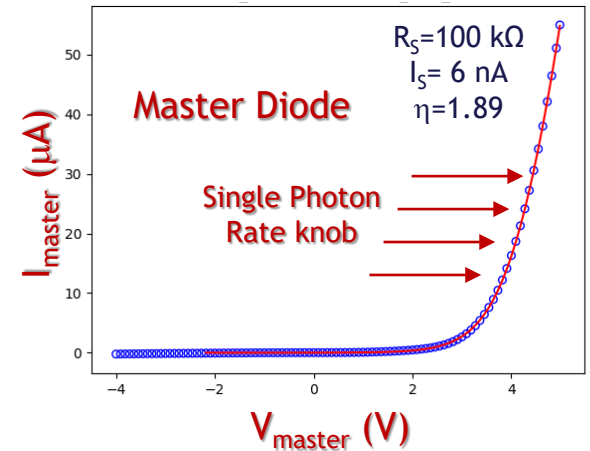
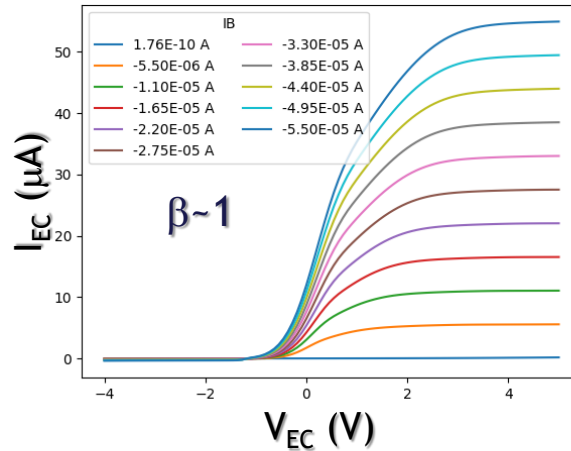
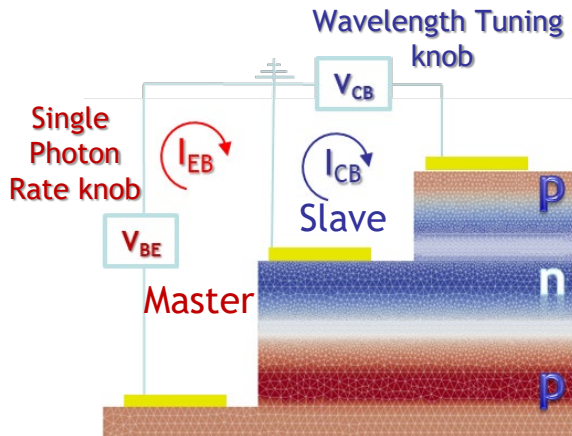


Euramet EMPIR
Proyecto SIQUEST (2018-2020)



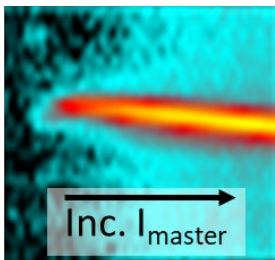
Plug&play single photon source

IV Characterization @RT

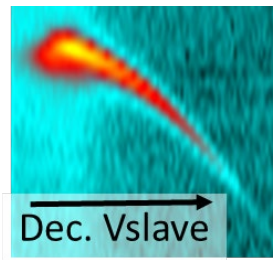


Plug&play single photon source

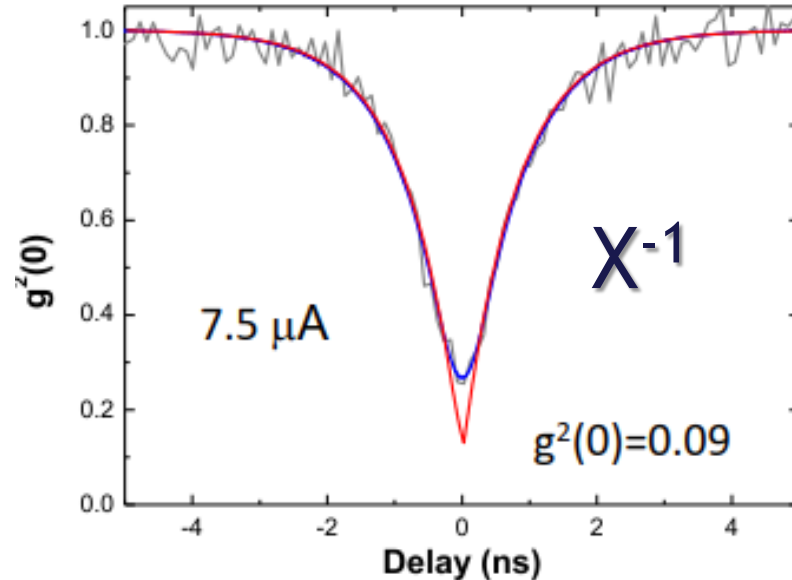
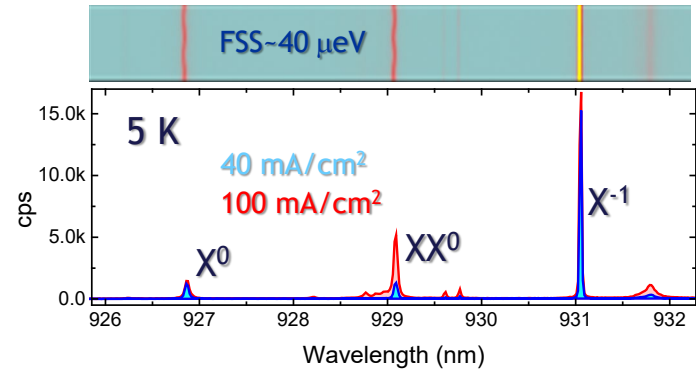
Single Photon Emission



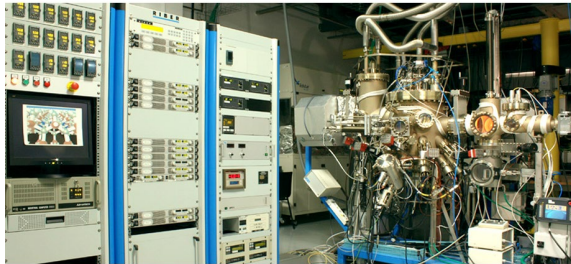
60 μeV shift



500 μeV tune



Building up a spanish solid state QT platform



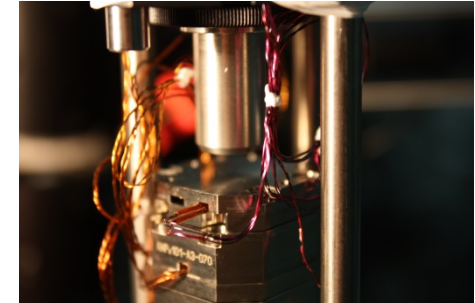
MBE Epitaxial Laboratory

- 5 MBE reactors
- III/V compounds: Ga, As, In, Al, P, Sb
- Dopants: Si, Be
- In-situ characterization



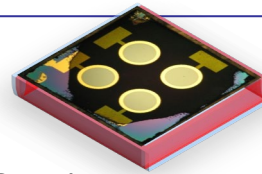
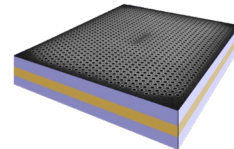
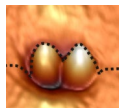
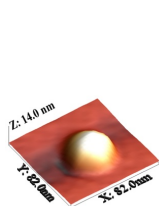
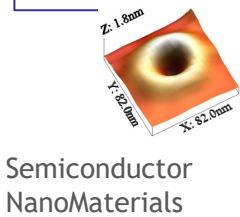
Semiconductor Processing

- Electron Beam Litho
- UV Litho
- Focused Ion Beam Litho
- RIE Etching
- PECVD, Sputtering, ...

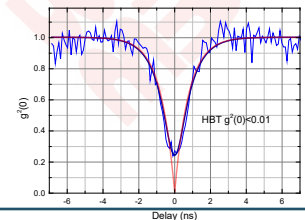
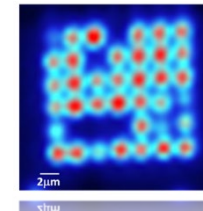


Quantum NanoOptics Laboratory

- Cryogenic Microspectroscopy: 3.5 K to RT
- Diffraction Limited Spatial Resolution
- 100 ps Temporal Resolution
- Single Photon Detection (VIS-NIR-TELcom)
- Single Spin Physics (0-9 T magnet)
- Photon Correlation Spectroscopy



Single Photon Sources





Plug and play SPS with 7.5 microA pumping and 500 kHz count rate. On-going work to improve fabrication yield and tuneability.

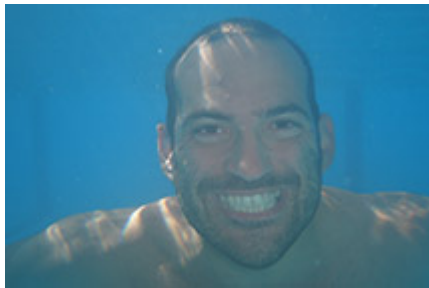
Looking for industrial partners and investors

¡Gracias!



benito.alen@csic.es

Dr. David Fuster



Technology

Dr. Yolanda González

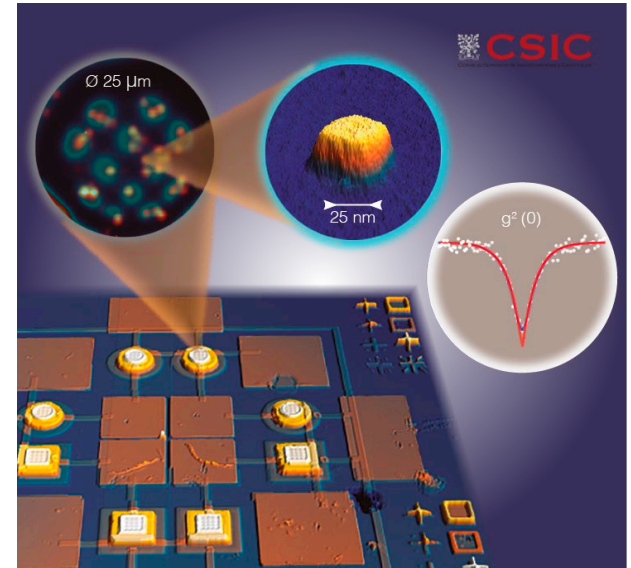


Epitaxial Growth

Dr. José Llorens



Simulation



EMPIR

