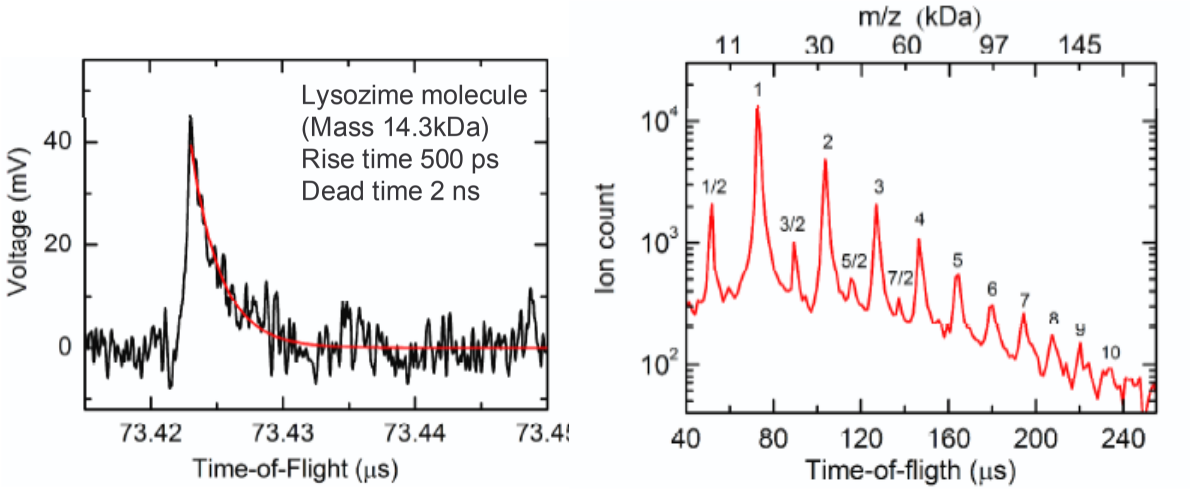
CNR - ICIB Commessa Cristiano

Rivelatori quantistici e dispositivi superconduttori non convenzionali

# Superconducting nanostrip macromolecules detectors

Efficiency to mass > 100 kDa (heavy ions, proteins and DNA-fragments)
Applications: Time-of-flight mass spectrometry.

**2×2 mm² Parallel nanostrip detector** with unique properties of efficiency and speed
**The largest and fastest superconducting detector of molecules !**




**Devices characteristics**

1120 NbN nanostrips

| | |
|---|---|
| width | 1 μm |
| Thickness | 50 nm |
| length | 2 mm |
| Area coverage | 2x2 mm² |

**Latest Publications**


- Casaburi *et al. APL* 98 023702 (2011)
- Cristiano *et al JLTP* 167 979 (2012)
- Ohkubo *et al JLTP* 167 943 (2012)
- Zen *et al, Physics Procedia* 27 356 ( 2012 )

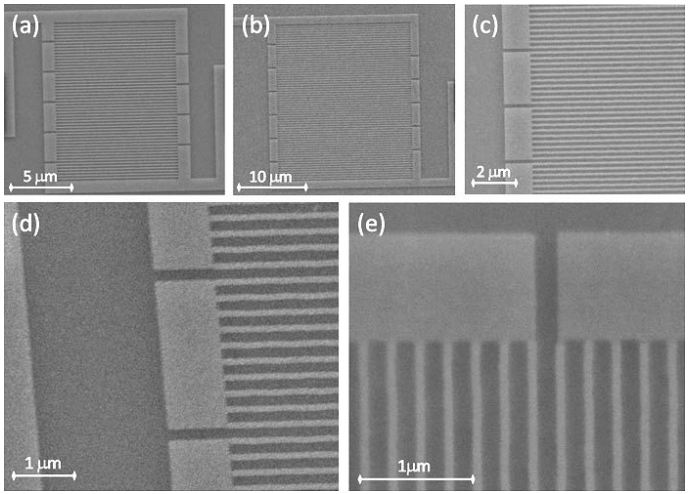
CNR - ICIB Commessa Cristiano

Rivelatori quantistici e dispositivi superconduttori non convenzionali

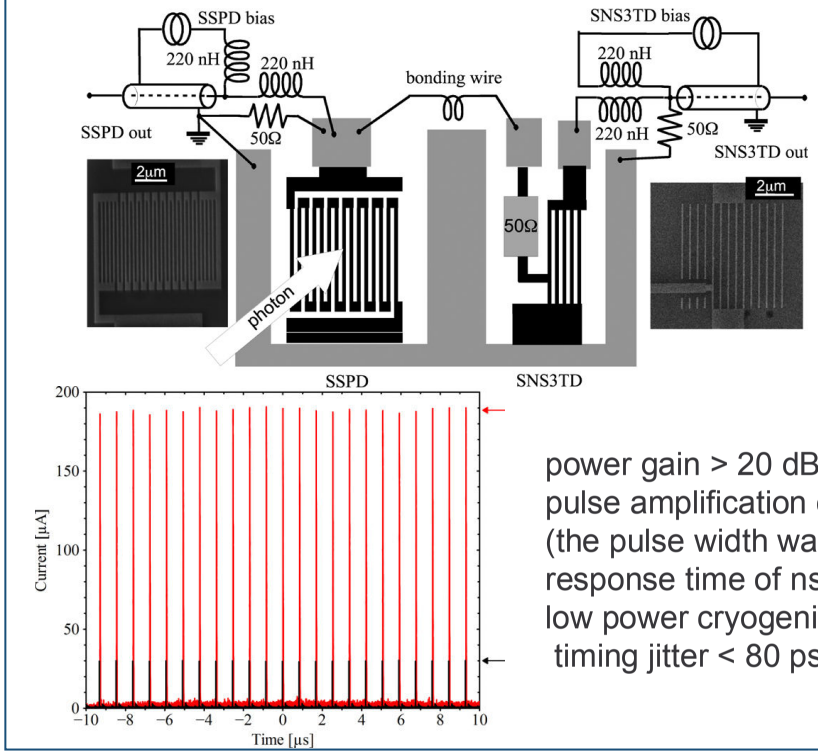
# Superconducting nanowires broadband single-photon detectors

Sensitivity range: IR-visible wavelengths
Applications: quantum information and communication, quantum cryptography, quantum optics.

**40x40 μm²** Parallel superconducting nanowires detector.
**The largest and fastest superconducting detector of IR single-photons !**




**Pulse discriminators based on parallel NbN nanostrips**




power gain > 20 dB,
pulse amplification of 12
(the pulse width was 1 ns)
response time of ns,
low power cryogenic operation
timing jitter < 80 ps

**Latest Publications**

Mattioli *et al, J. Vac. Sci. Technol.* B 30 031204 (2012)
Casaburi et al, *J NANOPAR RES*, 13 (2011) 6121
Ejrnaes et al *SUST* 24 (2011) 035018
Pagano et al *IEEE-TAS* 21 (2011) 717