

# Presentazione delle attività del gruppo 5

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Massimo Chiari, INFN

# Situazione esperimenti Sezione di Firenze

(rn = resp. nazionale in sede)

- **Sigle in chiusura:**

TIC (rn)  
CHNET\_LILLIPUT (rn)  
LAPUTA (resp. naz. GE)  
REDSOX2\_DTZ (resp. naz. TS)

- **Sigle in continuazione:**

3DOSE (resp. naz. PG)  
DESIGN (resp. naz. MI)  
L3IA (resp. naz. MI-PI), estensione  
SICILIA (resp. naz. LNS) *call*, estensione  
TIMESPOT (resp. naz. CA) *call*  
TRACCIA (rn)  
EuroGammaS  
PP-MURAVES

- **Nuove sigle:**

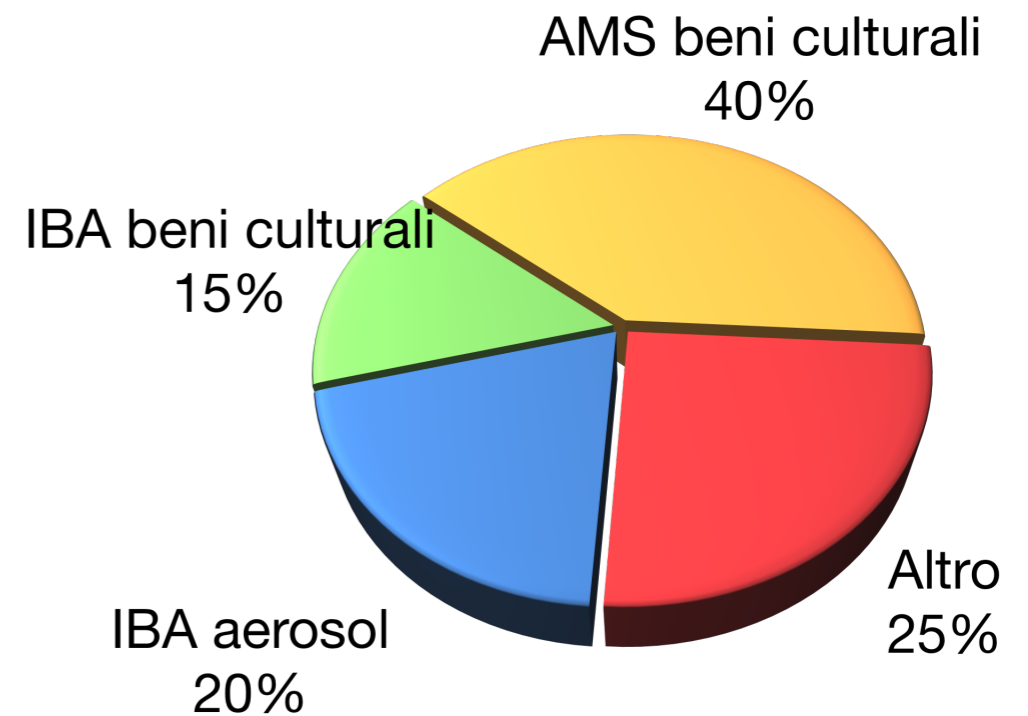
AIM (resp. naz. PI)  
CRYOMIRROR (resp. naz. PD) *call*  
FLAGS (resp. naz. GE) *call*  
MITO (rn)  
PERO' (rn)  
THEEOM (resp. naz. TIFPA)

Nel 2018...

FTE: 17.5 (54 persone, 0.32 FTE/persona)  
Budget: 91.0 k€ (1.7% budget CSN5)

nessuna proposta  
Grant giovani

- Lorenzo Sodi, borsista tecnico meccanico (da Giugno)
- Suddivisione beamtime (2017): 20% IBA aerosol, 15% IBA beni culturali, 40% AMS beni culturali, 25% altro (test rivelatori, impiantazione ionica, calibrazioni, analisi materiali, misure sezioni d'urto)
- Knowledge Exchange e Knowledge Transfer (training di fellows IAEA, networking CHNet, progettazione beamline IBA in altri laboratori...)
- Attività di prestazione in conto terzi (sia INFN che UniFi)
- Terza missione: Art & Science, ScienzEstate, ASL, training camp beni culturali...
- Progetti extra CSN: SIDDARTA (PNRA), CRP IAEA Forensics, coll. internazionali (Cina e India), MACHINA (FISR), LaserPIXE (RT)
- Prospettive: RADIATE (H2020), ACTRIS-PPP (ERIC), ACTRIS-Italia (PON), PRIN (3 proposte)



# Richieste mesi/uomo Servizi di Sezione

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	AIM	3DOSE	CRYO MIRROR	DESIGN	FLAGS	L3IA	MITO	PERO'	SICILIA	THEEOM	TIME SPOT	TRACCIA	Euro Gamm aS	PP-MURAVES	LABEC
Officina meccanica	0	1	0	1	2	0	3	0	0.5	0	1	1	1	1	2
Elettronica	0	1	0	0	2	0	5	0	0	0	1	0	2	1	1
Camere pulite	0	1	0	0	0	0	0	1	0.5	0	1	0	0	0	0
Servizio tecnico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5

Totale gr. 5: 13.5 mesi/uomo Officina meccanica

13 mesi/uomo Elettronica

3.5 mesi/uomo Camere pulite

0.5 mesi/uomo Servizio tecnico

# R&D CSN5 proposal

## tHEEOM

technology for High Efficiency Electro Optical Modulator

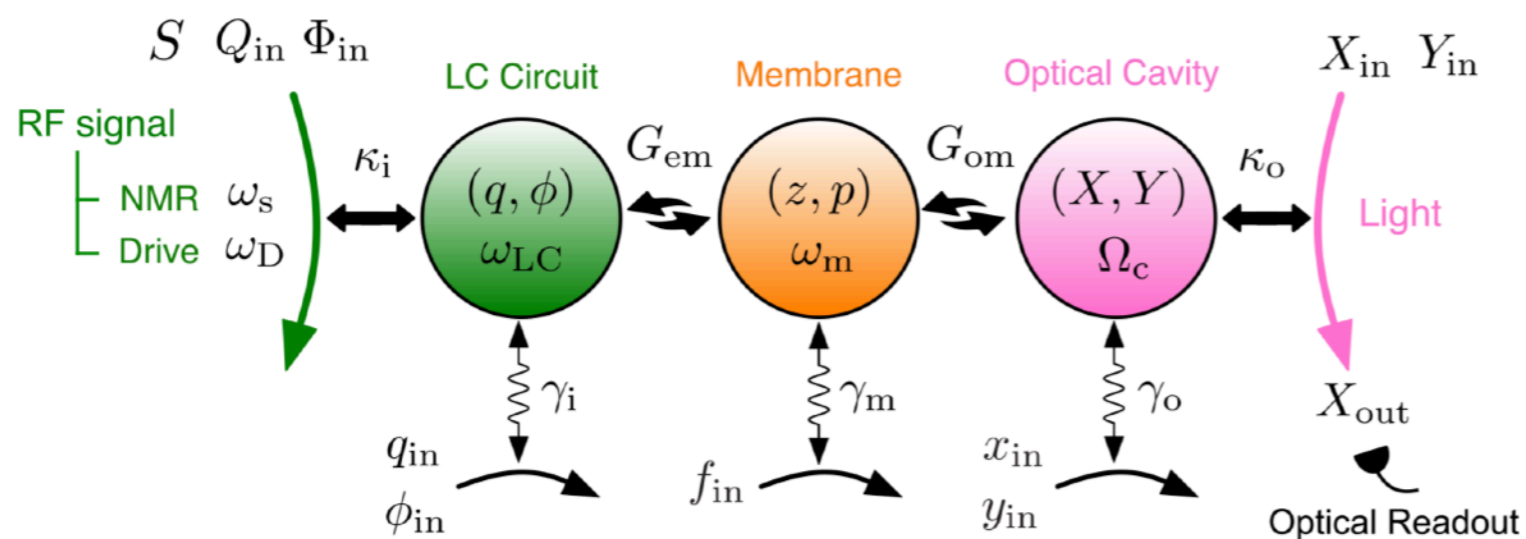
E. Serra



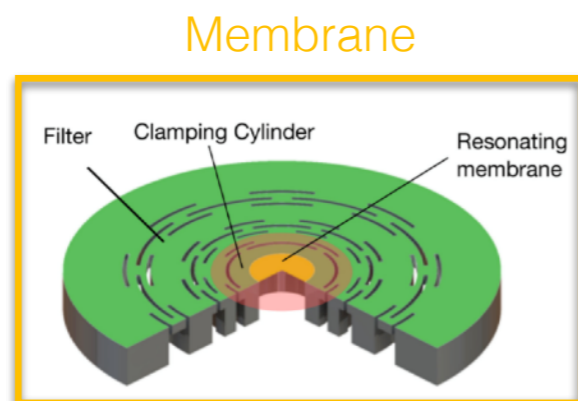
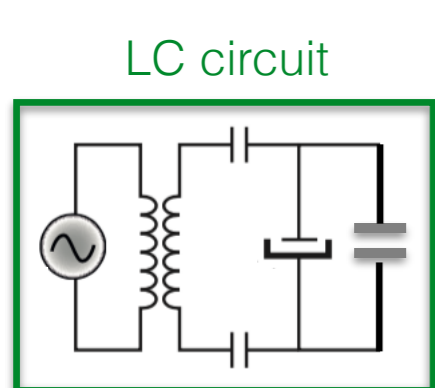
Trento Institute for  
Fundamental Physics  
and Applications

**+ Firenze + Perugia (UNI Camerino)**

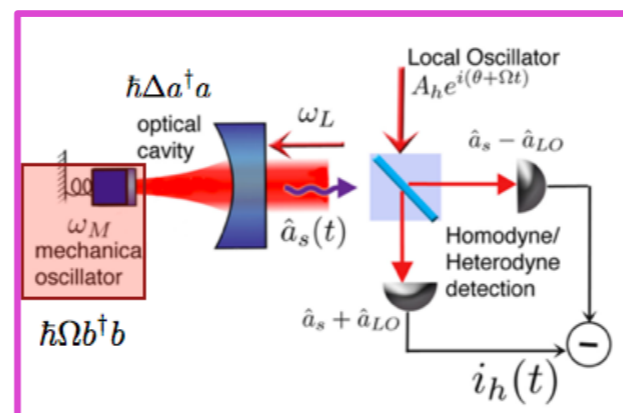
# Science & goals of tHEEOM



Interdisciplinary R&D on MEMS technologies for high efficiency electro-opto modulators and RF/Optical conversion of weak RF signals. Demonstrate **coherent conversion** of radio and microwave frequencies to the **optical domain**



MOMS insulated membrane resonator from INFN HUMOR CSN2

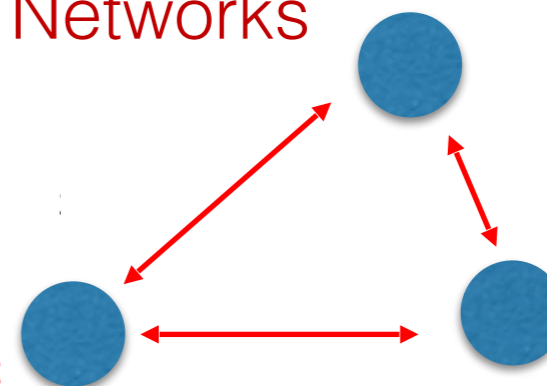
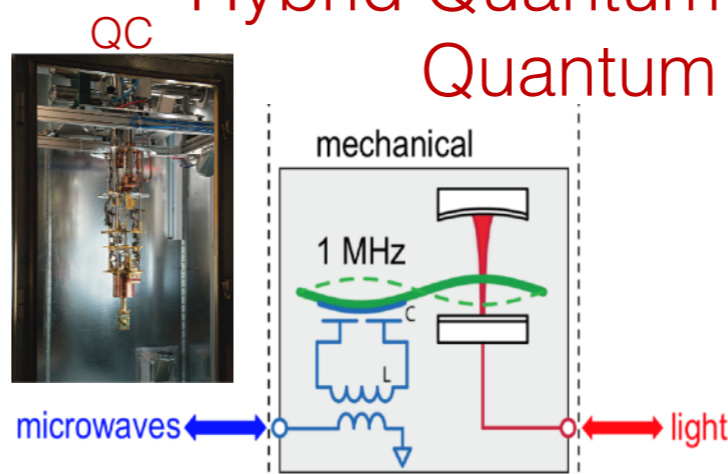


Technological challenge: Integration of Hybrid System with an on-chip approach and advanced optical schemes & protocols

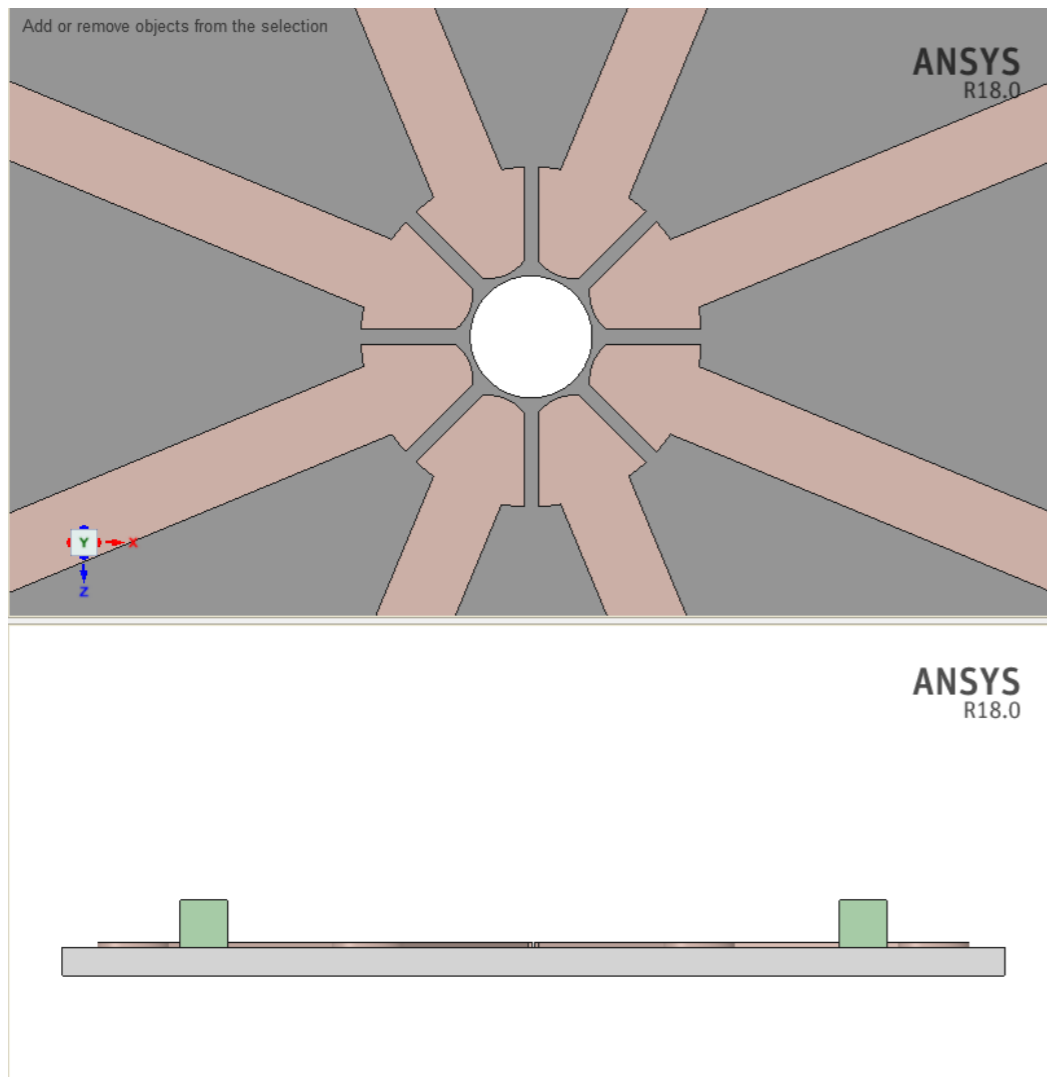
RF ultra-high sensitivity detector in MNR



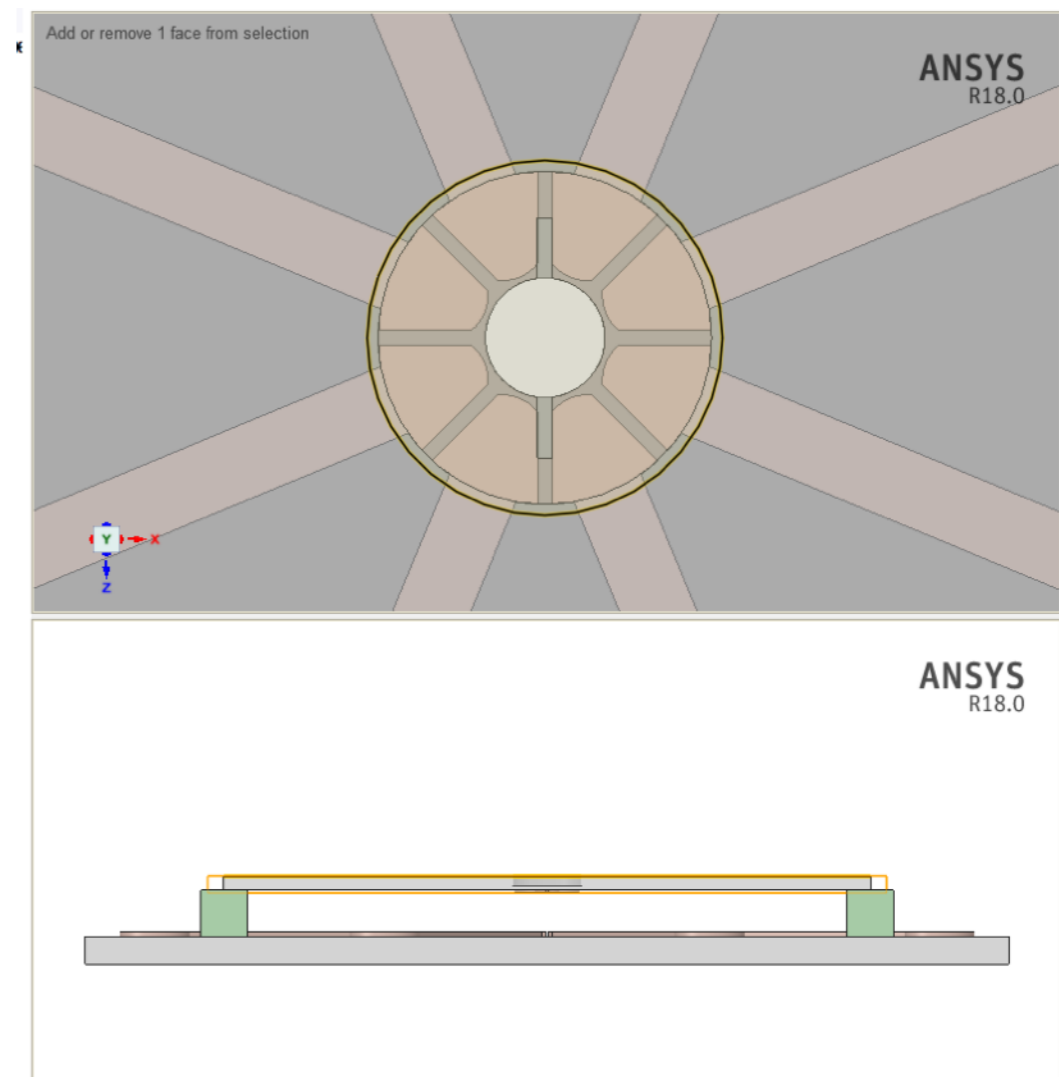
Hybrid Quantum linkers rf/Opto in Quantum Networks



# Ideas for Electro/Opto interface



Base electrode



On-chip rf/opto modulator

# Partners

<b>Nr.</b>	<b>Unità partecipanti</b>	<b>Referenti</b>
1	<i>INFN-TIFPA (Trento)</i>	<i>Dr. Enrico Serra</i>
2	<i>INFN-PG (sezione di Perugia)</i>	<i>Prof. David Vitali</i>
3	<i>INFN-FI (sezione di Firenze)</i>	<i>Prof. Francesco Marin</i>
4	<i>CNR-IMEM (Trento)</i>	<i>Dr. Michele Bonaldi</i>
5	<i>TU-Delft-EKL (Delft, The Netherlands)</i>	<i>Dr. Gregory Pandraud</i>

## Three-years experiment:

*First and second year – Design e sviluppo della tecnologia integrazione dell'interfaccia RF*

*Third year - Sviluppo del protocollo di misura per caratterizzazione (Responsabile: INFN-PG – David Vitali)*