

# **COLLABORAZIONI LABORATORIO NIXT** *(New Imaging X-ray Technologies)*



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Our team:



Francesco Cordella  
Gerardo Claps  
Antonella Tamburrino  
Valerio Piergotti  
Danilo Pacella

Head of 

Lab **NIXT** (New Imaging X-ray Techniques) in ENEA-Frascati

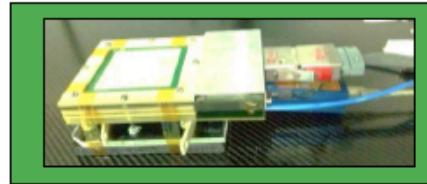


**LE ATTIVITA' DEL LABORATORIO NIXT SONO IN UN QUADRO DI COLLABORAZIONE ITALIANA E SI SVILUPPANO SU DIVERSE TECNOLOGIE E RIVELATORI PER RADIAZIONE X, GAMMA E NEUTRONICA**

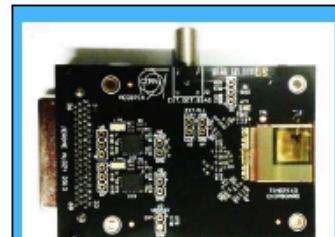
## Lab NIXT DETECTORS PORTFOLIO



**HYBRID  
GAS-ASIC**



**HYBRID**



in collab. with:



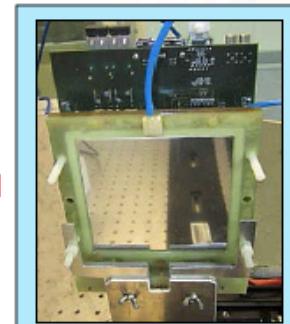
Istituto Nazionale di Fisica Nucleare



Consiglio  
Nazionale delle  
Ricerche

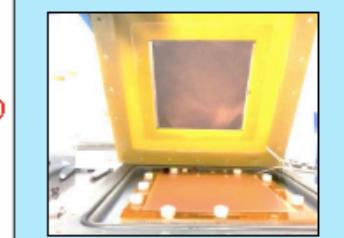


**1 - GEM**



**GAS**

**2 - BORATED  
GEM**



**SOLID STATE**



**slide 2 of 35**

**COMPACT DETECTORS**

**5 - Diamondpix  
with CVD**

**4 - Timepix, Timepix3  
with neutron  
converter**

$\sim 1\text{ meV}$

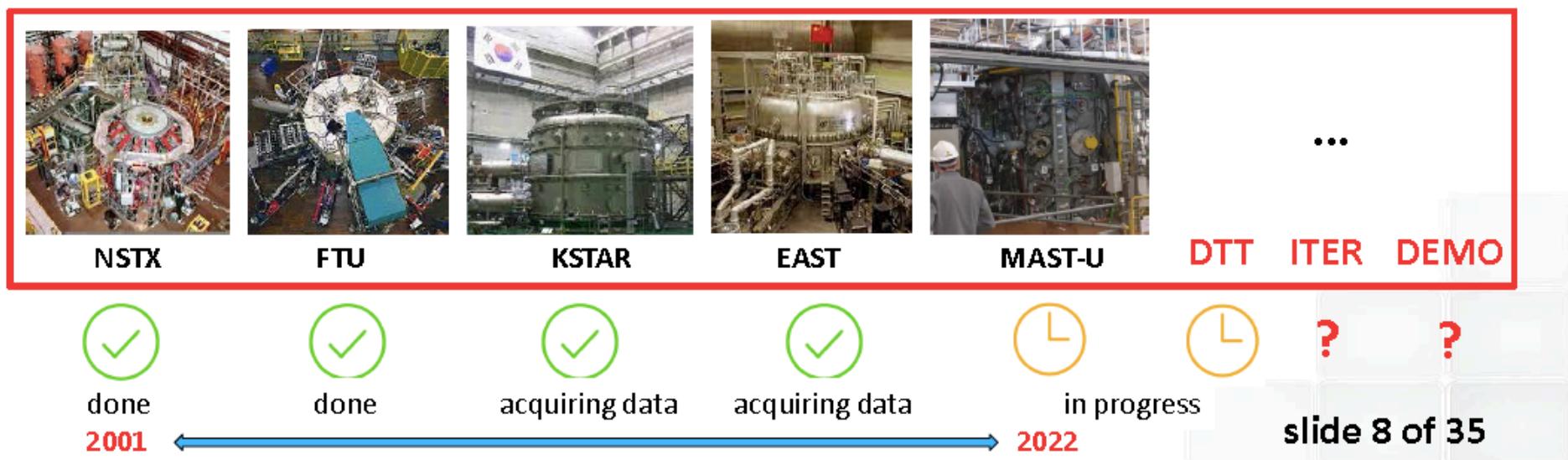
**Energy range investigated**

**3 - Timepix,  
Timepix3**

$\sim 10\text{ MeV}$

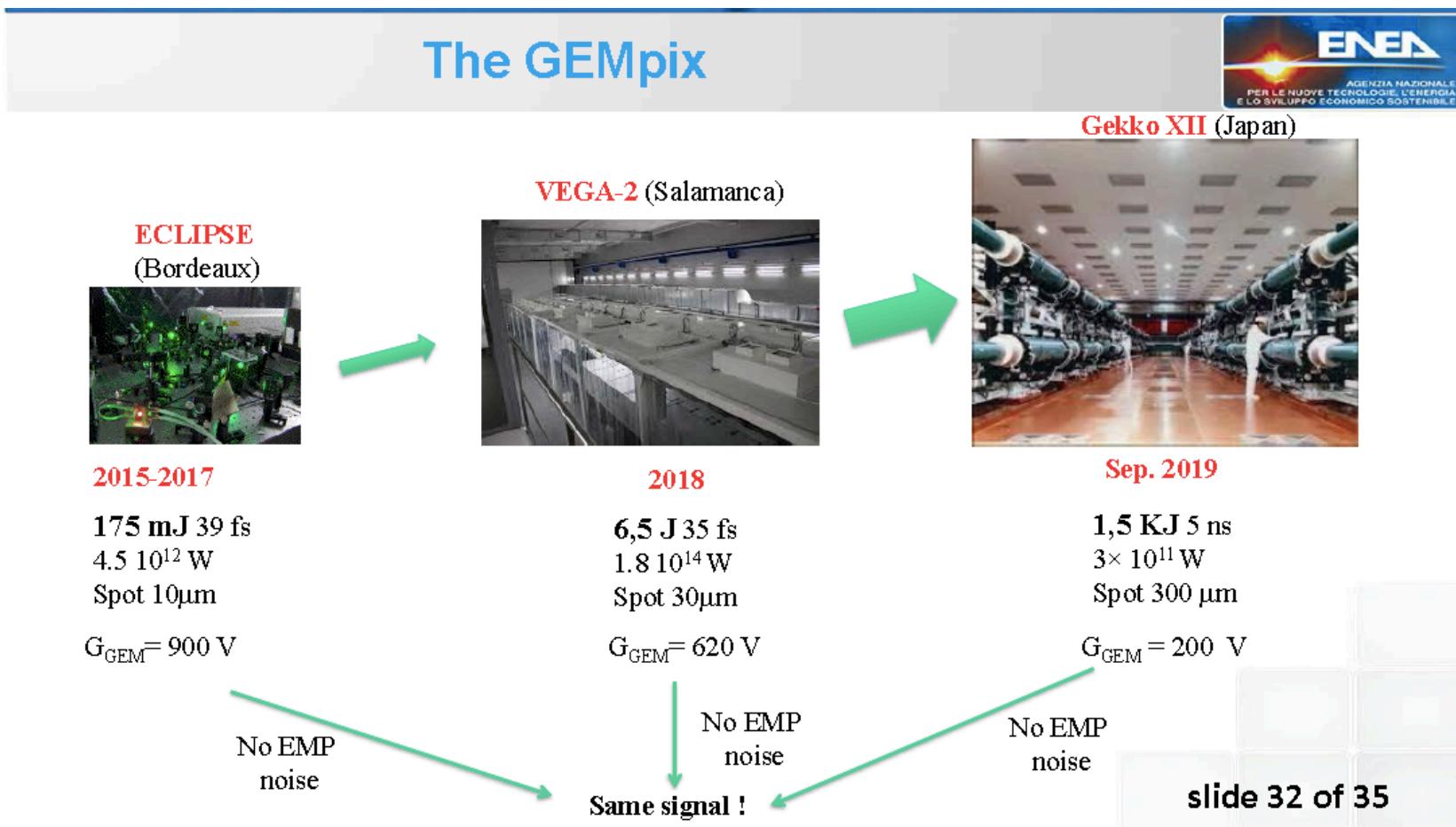
# FUSIONE MAGNETICA

- KSTAR camera GEM 2-D installata dal 2013
- EAST camera GEM 2-D installata dal 2015
- DTT 2 task per diagnostiche SXR con GEM dal 2011
- MAST: installazione GEM nuova generazione (2011)
- ITER : New advanced detectors for X-ray camera (in avvio)



# FUSIONE INERZIALE

- ER-IFE 2019- 2020 e 2021-2023
- Collaborazione con Università di Bordeaux dal 2015 (D. Batani)
- Esperimenti a Eclipse (Bordeaux), VEGA (Spagna), Gekko XII (Giappone)



# NEUTRONICA

- Collaborazione con La Facoltà di Ingegneria dell'università di Roma La Sapienza ( Dottoranda Antonella Tamburrino)

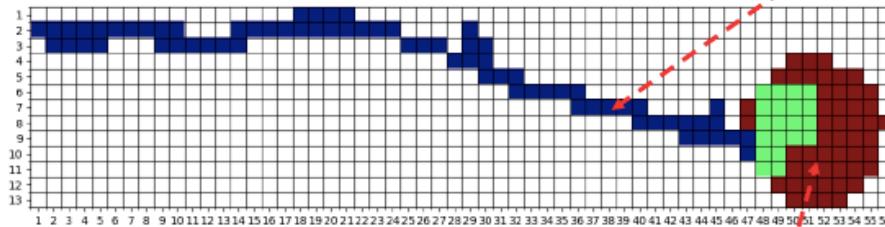
## TPX3 for Radon measurement



Part of Radon decay chain:

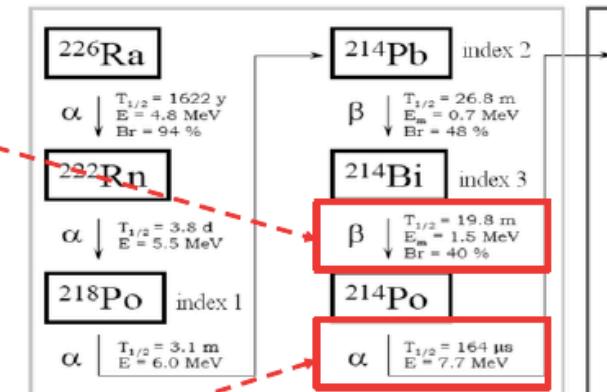


ToA graph



1.5 MeV e-  
ToA~2500 ns

7.7 MeV alpha  
ToA~ 182500 ns



Single cluster difference of  $\Delta t \sim 180 \text{ us}$   
to be compared with the theoretical  
statistical difference of  $\Delta t \sim 164 \text{ us}$

Using the sharp differences in ToA, it's possible to split the above single cluster in two clusters: one for the **beta track** and the other for the **alpha track**

# APPLICAZIONI

## MICROTOMOGRAFIA SOFT X-RAY DI MESOSCALA PER CAMPIONI BIOLOGICI CON RISOLUZIONE IN OTTIMIZZATA BANDA DI ENERGIA

In collaborazione con centro di biologia marina dell'ENEA di Santa Teresa (La Spezia)

C. LOMBARDI, G. RAITERI, A. BORDONE  
G. CERRATI, A. PEIRANO

Biodiversity and Ecosystem Services Laboratory  
Santa Teresa Research Centre, La Spezia

S. COCITO

Division Protection and Enhancement  
of the Natural Capital  
Santa Teresa Research Centre, La Spezia

D. PACELLA, G. CLAPS  
F. ANDREOLI, L. GABELLIERI

Sources, Antennas and Diagnostics Laboratory  
Frascati Research Centre, Rome

M. ADANI

Atmospheric Pollution Laboratory  
Bologna Research Centre, Bologna

### WILL CORALLINE ALGAE REEF MITIGATE CLIMATE CHANGE EFFECTS ON ASSOCIATED FAUNA?

A methodological approach to develop "MIMICS" of  
coralline algae *Ellisolandia elongata* for climate change studies

M. NANNINI, S. ALIANI

CNR - Institute of Marine Science  
Via Santa Teresa, 19032 Pozzuolo di Lerici, La Spezia

A. LUCHETTA, C. CANTONI

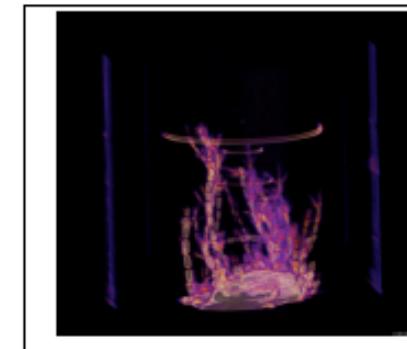
CNR - Institute of Marine Science  
Area Science Park, Basovizza, Ed. Q2, SS 14-km. 163.5  
34139, Trieste

A. MARCHINI, K. RUGGERO

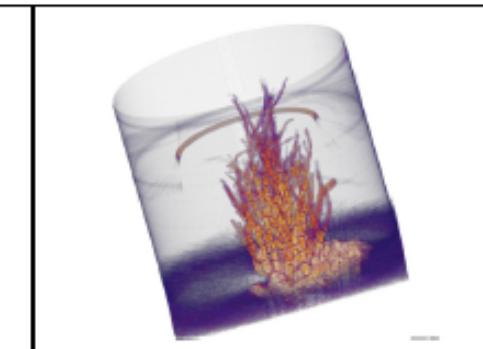
Department of Earth and Environmental Science  
University of Pavia, Via S. Epifanio, 14 - 27100, Pavia

D. CHRISTOPHER PAGE, F. RAGAZZOLA

Institute of Marine Sciences  
University of Portsmouth, Ferry Road,  
Eastley Portsmouth PO4 9LY UK



Lucy-Richardson (ML-ME) [time= 1 hr]



Filtered Back Projection (FBP) [time= 10 s]

## **SUMMARY 1/2**

### **FUSIONE MAGNETICA**

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### **NEUTRONICA**

- Collaborazione con La Sapienza ( Dottoranda Antonella Tamburrino)

### **APPLICAZIONI**

- Microtomografia soft-X per biologia marina (ENEA S: Teresa)

## Summary 2/2



NSTX



FTU



KSTAR



EAST



MAST-U



DTT

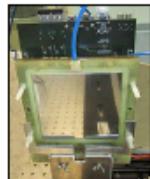
ITER

DEMO

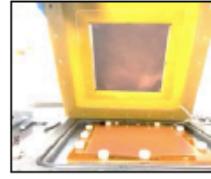
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Magnetic confined plasmas

1-GEM



2-BORATED GEM



3-TPX, TPX3



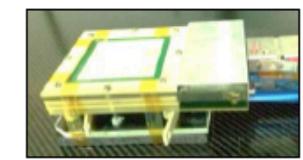
4-TPX, TPX3 w. convert.



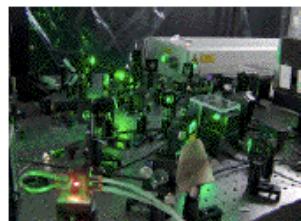
5-Diamondpix



6-GEMpix



Laser produced plasmas



ECLIPSE(Bordeaux)



VEGA-2 (Salamanca)



Gekko XII (Japan)

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Time for  
questions!

