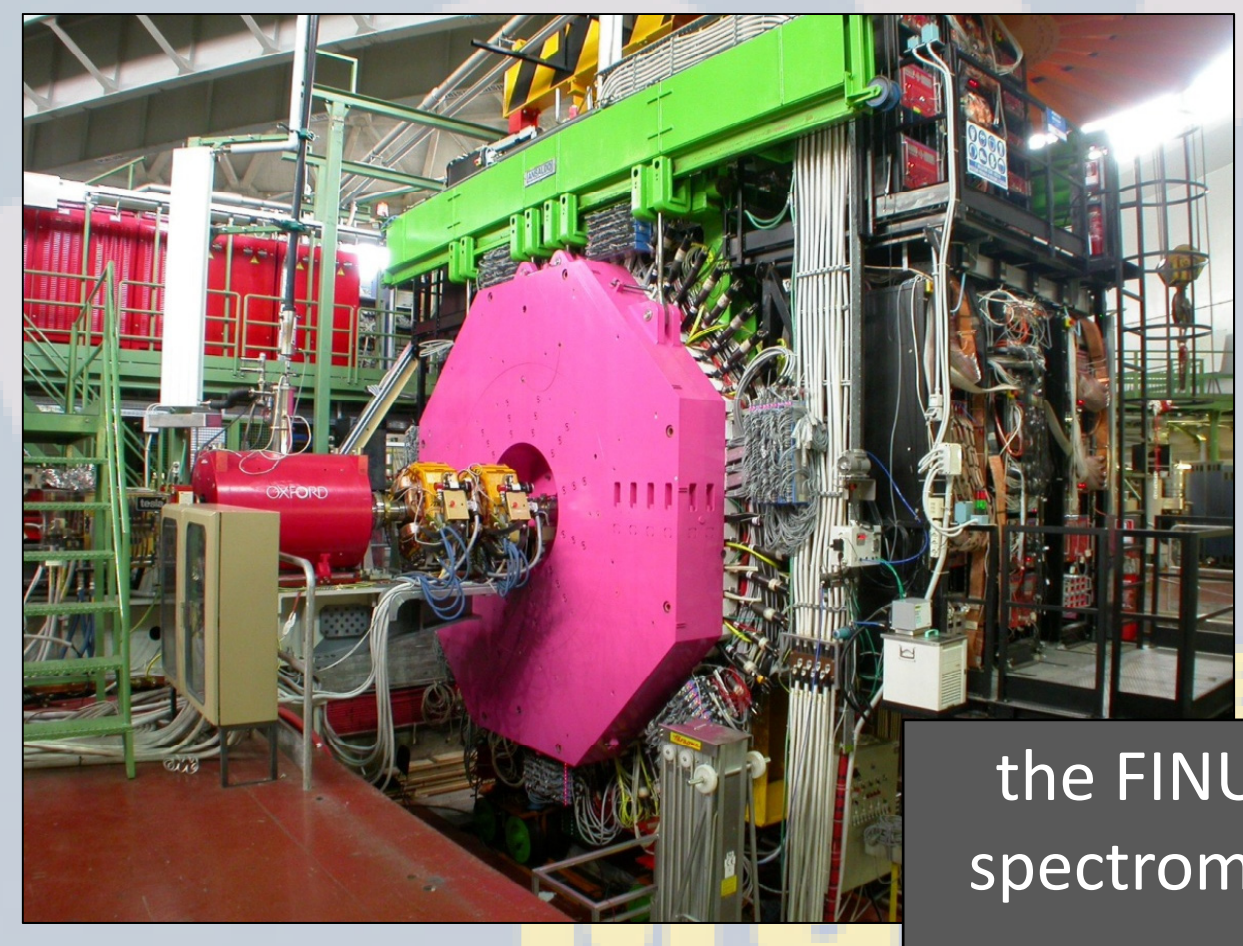


review of **few selected examples**, out of many live collaborations and future initiatives, from the point of view of an Italian experimentalist



the DAΦNE hall

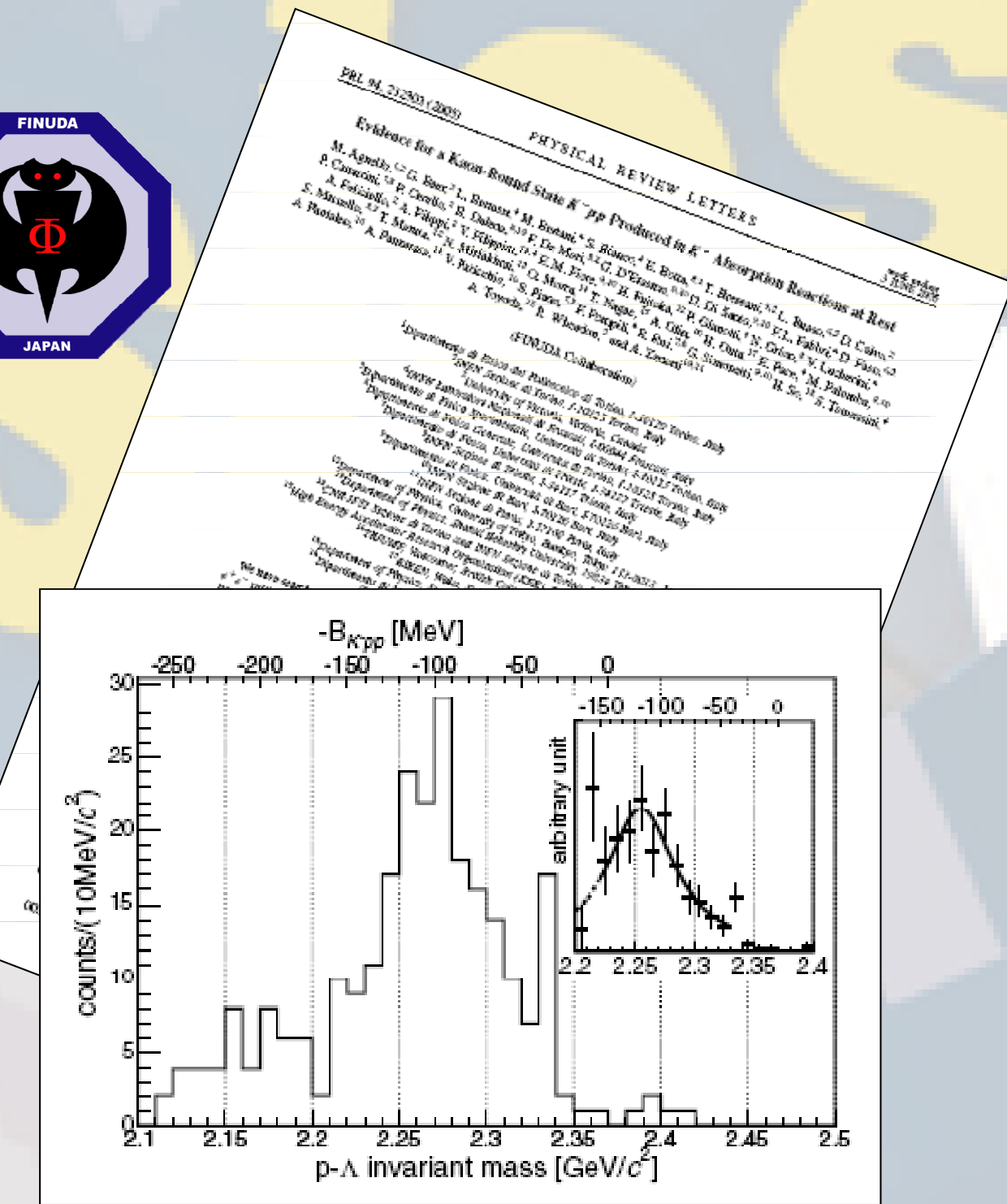
## Activity at INFN-LNF: the FINUDA experiment



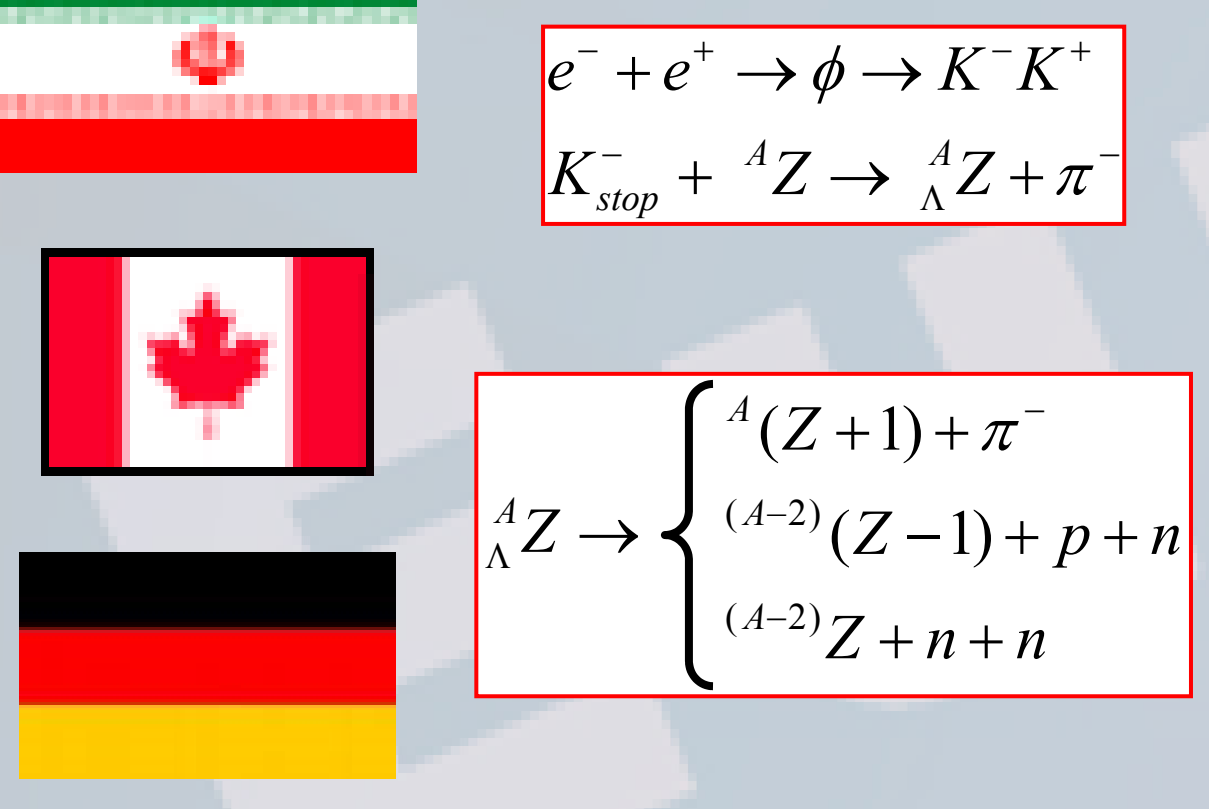
the FINUDA spectrometer



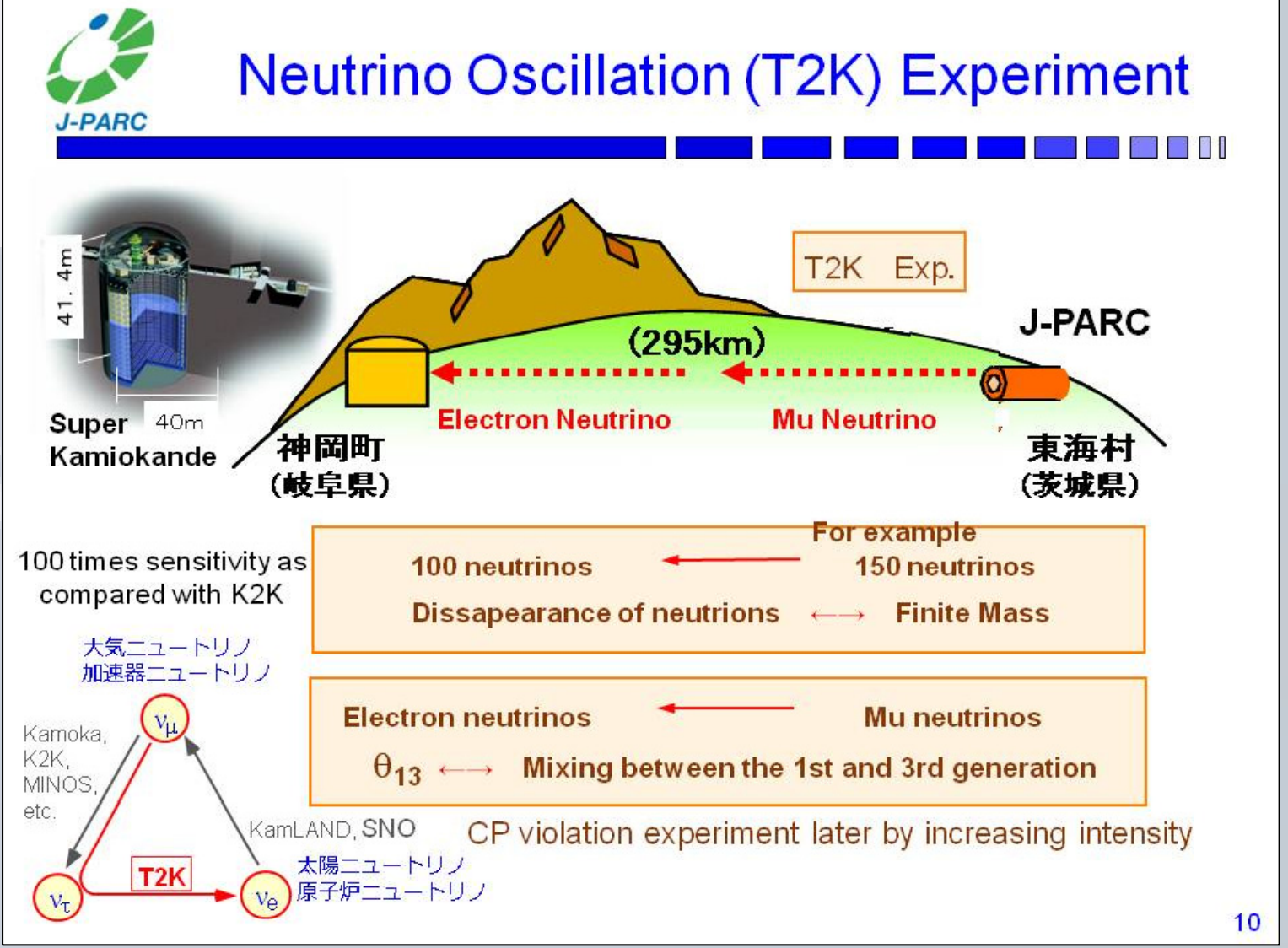
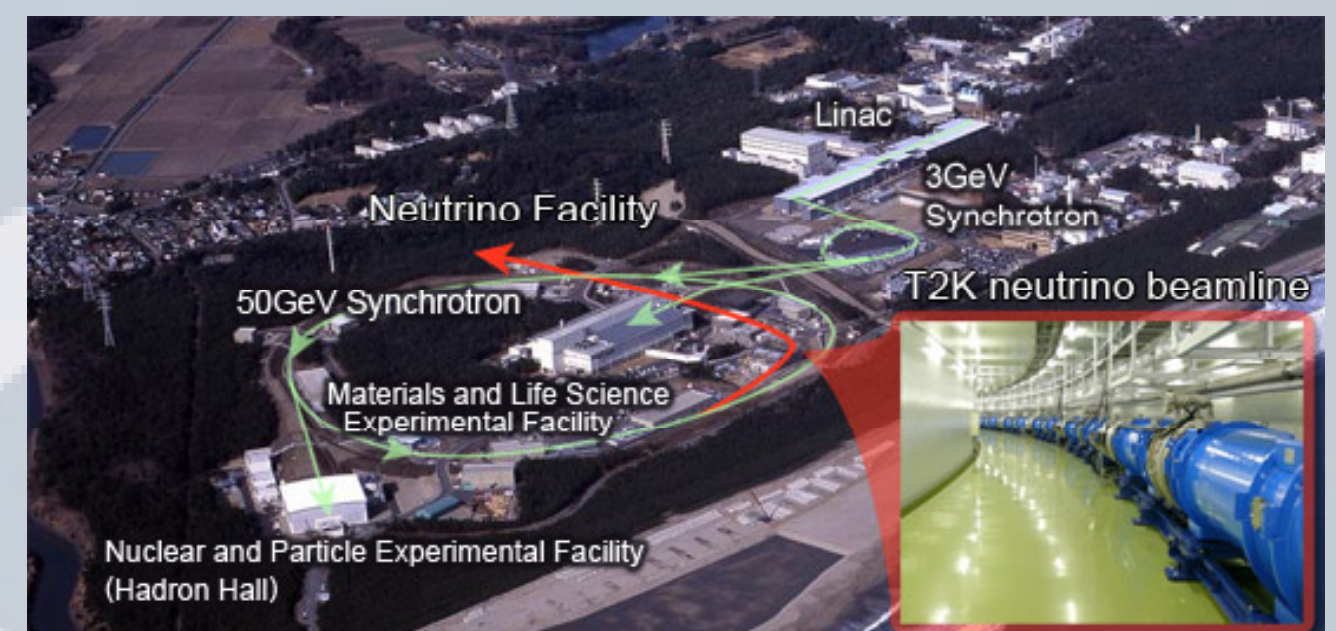
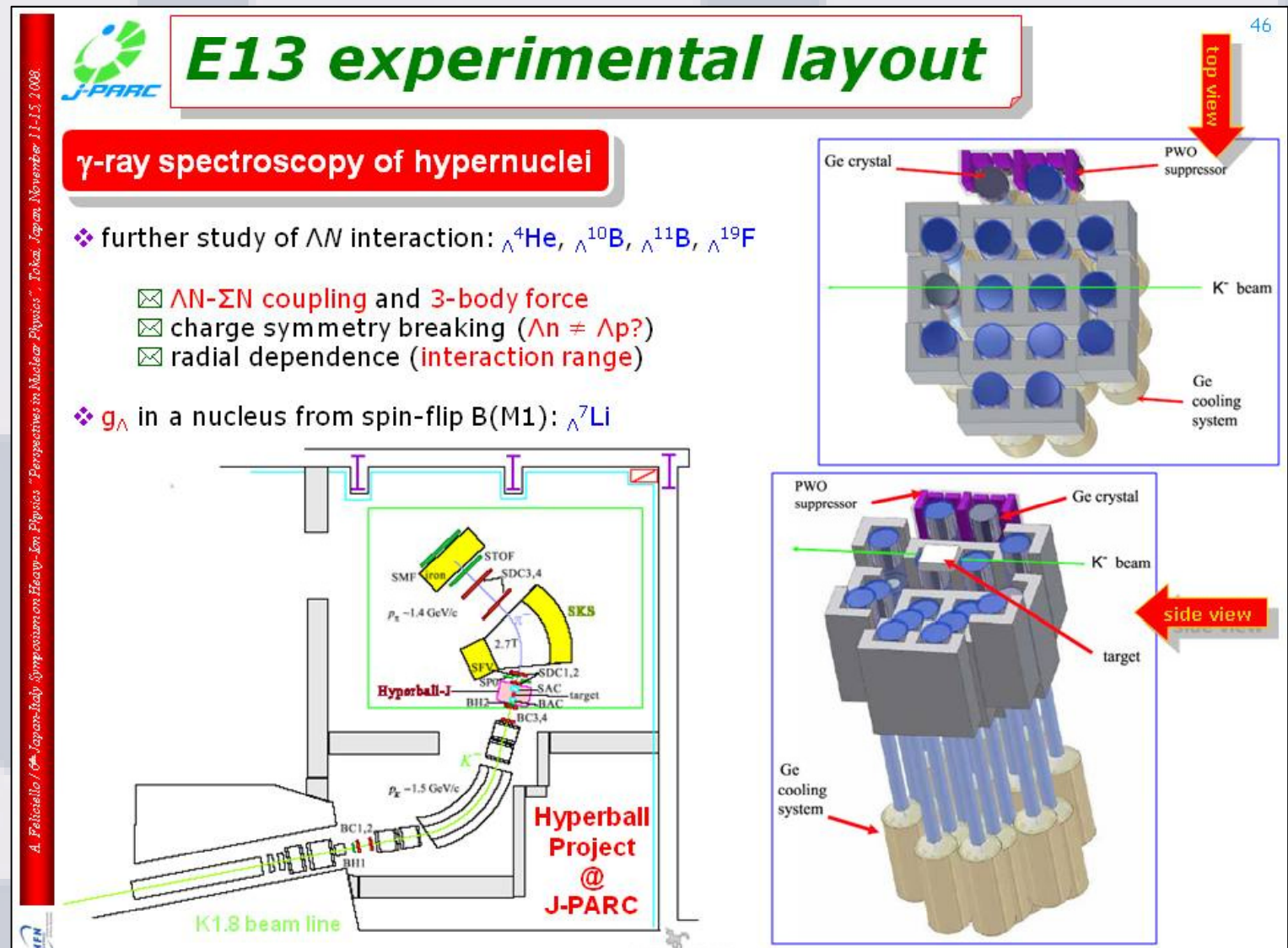
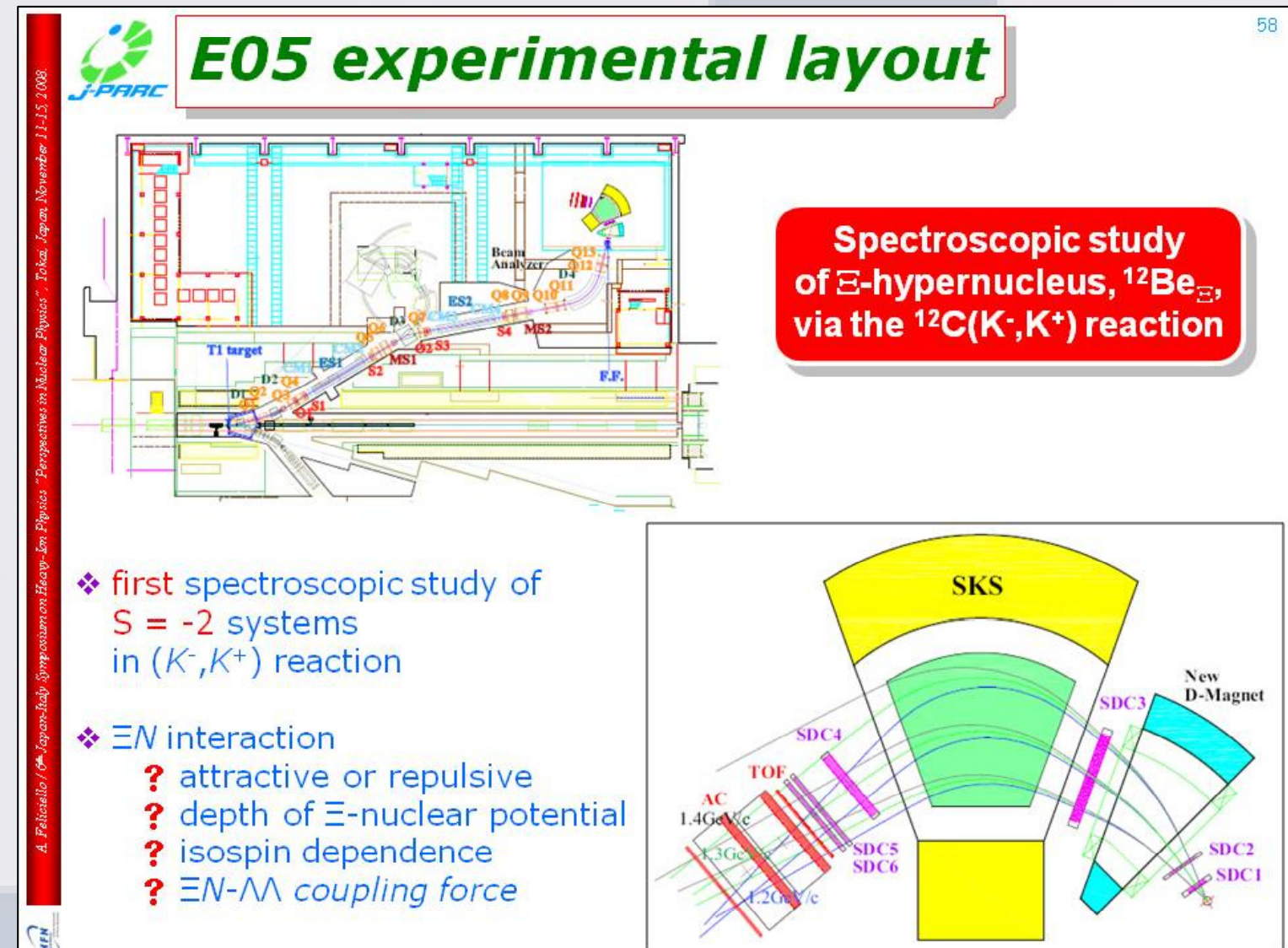
the FINUDA Time-Of-Flight



SPIRES TOPCITE = 100+



## INFN activity at J-PARC

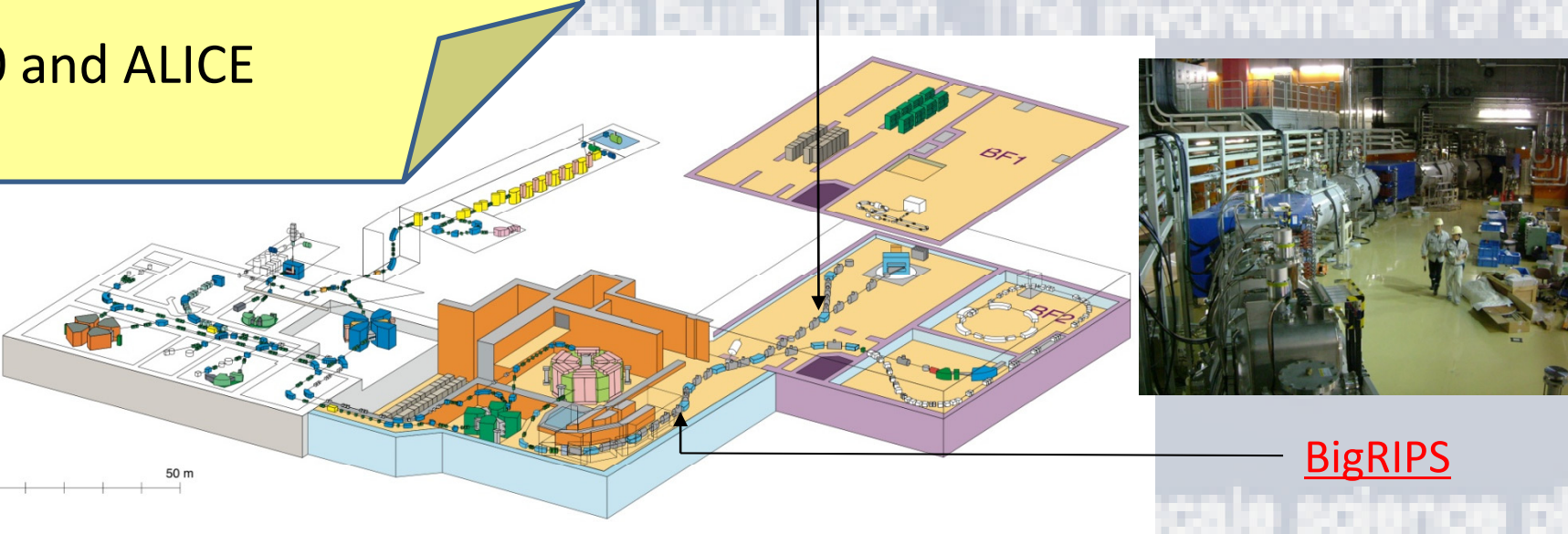


## The ULYSSES initiative

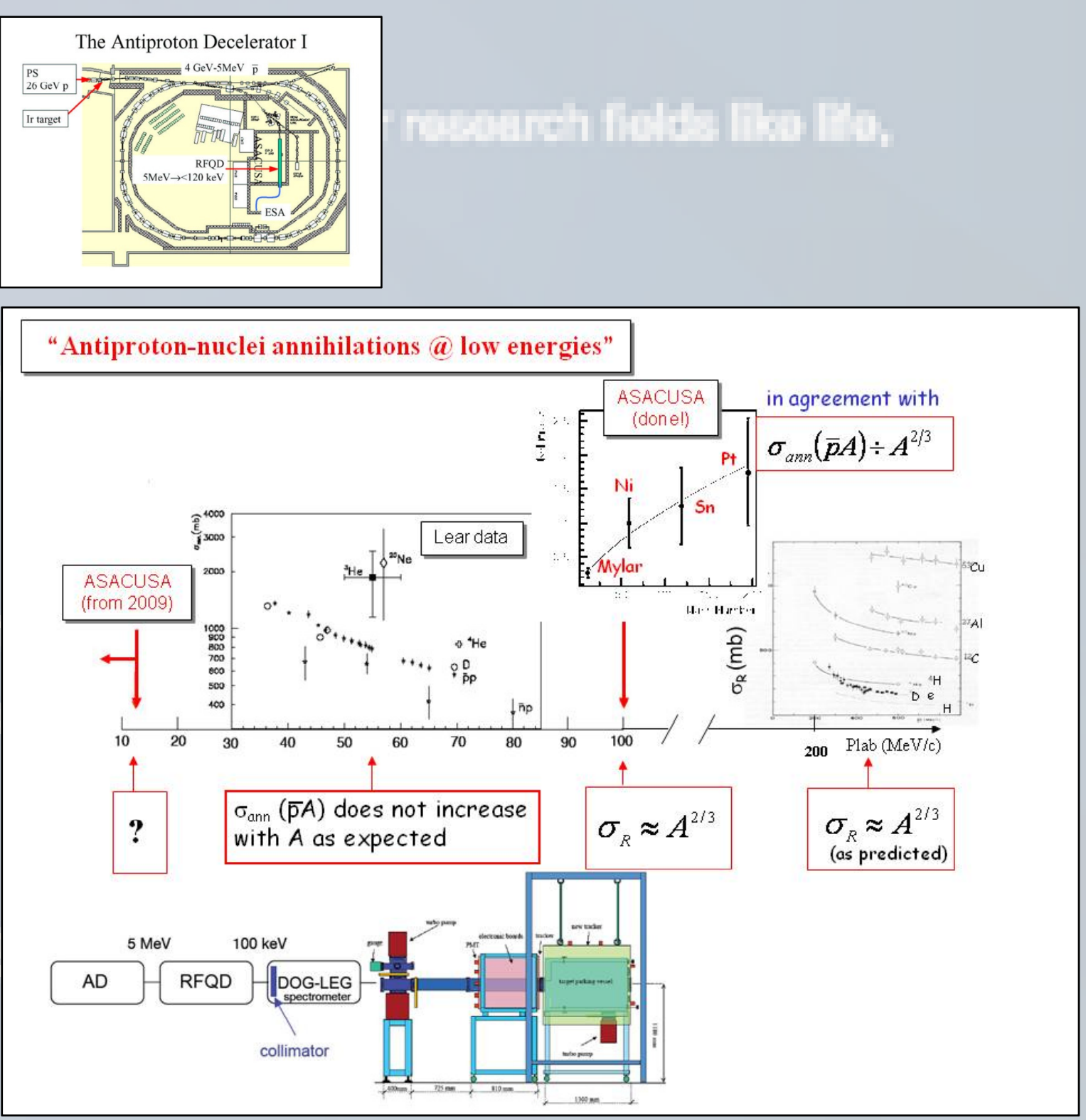
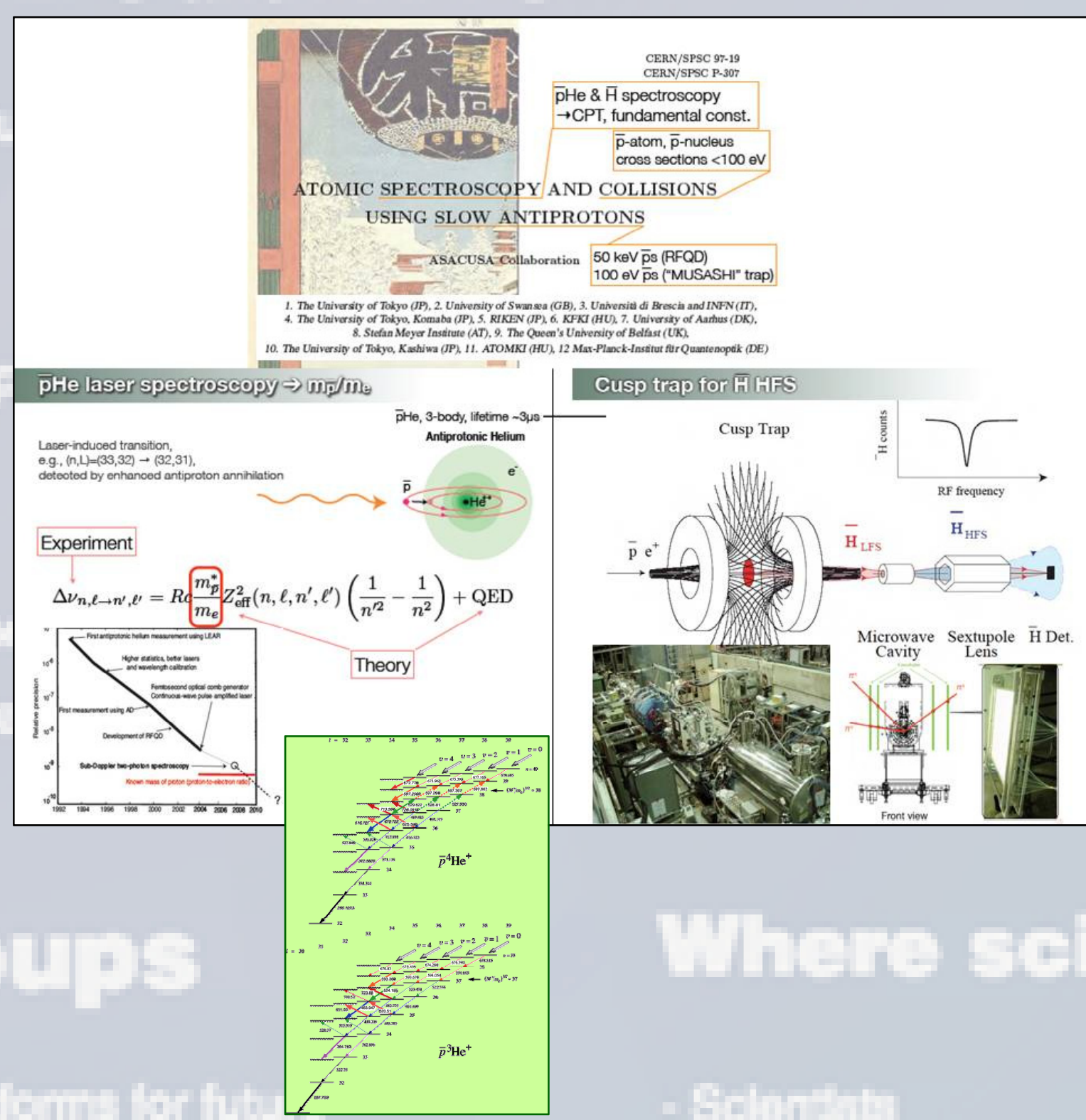
## INFN collaborations with RIKEN

- Nuclear Dynamics**
  - Structure of light halo exotic nuclei and of unbound nuclei (INFN-PI/th)
- Nuclear Structure**
  - Many-body nuclear structure theory and interdisciplinary applications (atomic physics) (INFN-MI/th)
  - Neutron-rich nuclei with RIB and shell time-evolution (INFN-MI, NA, PD, LNL/ex)
- Nuclear Matter**
  - Nuclear physics for compact stellar objects (neutron stars) (INFN-MI/th)
- Nuclear Astrophysics**
  - Indirect measurement of reaction of astrophysical interest (Trojan horse method) (INFN-CT/ex)
- H.I. Physics**
  - participation of Japanese researchers in the NA60 and ALICE experiments

Nuclear structure with  $\gamma$ -decay, using fragment beams at BigRIPS



## The ASACUSA experiment



## The BES III experiment

BESIII statistics @ designed peak luminosity ( $10^{33} \text{ cm}^{-2}\text{s}^{-1}$ )

- $R_{had}$  and precision test of Standard Model
- Light hadron spectroscopy ( $\Phi_c$  (980),  $\Phi_c'$ , ...)
- Charm and charmonium physics
- $\tau$  physics
- Precision measurements of CKM matrix elements
- Search for new physics / new particles
- Nucleonic time-like form factors

Physics	Energy (GeV)	Peak Luminosity ( $10^{33} \text{ cm}^{-2}\text{s}^{-1}$ )	Events/year	Existing data
$J/\psi$	3.097	0.6	$10 \times 10^6$	$60 \times 10^6$ (BESII)
$\tau$	3.67(?)	1.0	$12 \times 10^6$	$27 \times 10^6$ (CLEOc)
$\psi'$	3.686	1.0	$3 \times 10^6$	$14 \times 10^6$ (BESII)
D	3.77	1.0	$3 \times 10^6$	$5 \times 10^6$ (CLEOc)
Ds	4.03	0.6	$1 \times 10^6$	$4 \times 10^6$ (BES)
Ds	4.17	0.6	$3 \times 10^6$	$0.3 \times 10^6$ (CLEOc)
R scan	3.0-4.6	0.6(?)	1.0	---

BESIII Physics Book - arXiv: hep-ex/0809.1869 **10's data taking time each year**

Italian contribution: Time-like Nucleon Form Factors

- An exciting scenario allow for the investigation of Form Factors @ BESIII
- Possible data taking plans:
  - $e^+e^- \rightarrow pp$
  - $e^+e^- \rightarrow nn$
  - $e^+e^- \rightarrow \Lambda\Lambda$
  - $e^+e^- \rightarrow \Sigma\Sigma^0$
  - $e^+e^- \rightarrow \Lambda\Sigma^0$
  - $e^+e^- \rightarrow \Lambda^* \Lambda_c^*$
  - Time-like  $[G_E^p, G_M^p], [G_E^n, G_M^n]$  and  $[G_E^{\Lambda}, G_M^{\Lambda}]$
- Investigation performed @ unprecedented luminosities:
  - $\Psi(2S)$ : achieved  $\mathcal{L} = 3.3 \times 10^{32} \text{ cm}^{-2}\text{s}^{-1}$
  - $J/\psi$ : achieved  $\mathcal{L} = 0.7 \times 10^{32} \text{ cm}^{-2}\text{s}^{-1}$
- Investigation performed in a wide energy range:
  - $\sqrt{s}_{max} = 2 - 4.6 \text{ GeV}$

## The IFMIF project

