GAMMA-PD Outlook

Padova, 3.11.2015

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## Nuclear Structure hot topics

- How does shell structure evolve with neutron number ?
- How do NNN forces impact structure and reaction properties of nuclei ?
- What is the origin of simple patterns in complex nuclei?
- How does subatomic matter organize itself and what new phenomena emerge?
- How does the nucleon-nucleon interaction emerges from QCD?

### A worldwide scenario for nuclear facilities

- 2012: (JAPAN) Decided upgrade of RIBF with LINAC injector
- 2013: (US) NSAC recognizes FRIB (Facility for Rare Isotope Beams) as the highest priority (reluctantly the operation of RHIC is ranked second)
- 2014: (Canada) First beams from ARIEL facility at TRIUMF
- 2014: (Germany) FAIR re-evaluation: NUSTAR and APPA are top priorities with unique programs
- 2015: (CERN) HIE-ISOLDE upgrade: 4.3 MeV/u
- 2015: (US) LONG RANGE PLAN for NUCLEAR SCIENCE: new electron-ion collider (EIC) but subordinated to FRIB completion
- 2016: (France) SPIRAL1 upgraded
- 2018: (Italy) SPES beams
- 2019: (France) SPIRAL2 Phase 1+

### **The Worldwide Scenario**



... a common pattern



- LNL resident gamma spectrometer
- several experiments approved with international users
- testbed for technological developments
- training for students and young researchers

# GALILEO

In-beam<br/>test:<br/>July 2014First<br/>campaign:<br/>2015Array<br/>finalized:<br/>2017-18

Largest fraction of LNL beam time of the past 20 years ... and counting.

# **SPES: our contribution**

#### Instrumentation know-how (critical: electronics and daq)

- compact configuration: GALILEO β-decay
- in-beam experiments: AGATA

## Scientific know-how (critical: experience at the current RIB facilities)

- Shell evolution
- Collectivity development far from stability
- Bridge toward nuclear astrophysics / applied physics



#### Legnaro May 2015







### Scientific program, International commitments and external funding

Local spokesperson of experiments approved in major laboratories: NSCL (US), GANIL (France), GSI (Germany), RIKEN (Japan), ILL (Grenoble) and LNL (Italy)

#### **International committees and management**

- Scientific coordinator of the AGATA Physics campaign in GANIL
- GANIL and LNL Programme Advisory Committees
- Board of Directors Euroschool on Exotic Beams
- AGATA Management Board, Collaboration Council and WG Coordinator
- European Coordinator of the GAMMAPOOL Network
- Scientific Advisory Board of FAIR-RO
- European Coordinator EGAN (ENSAR) and NUSPIN (ENSAR2)

#### External funding: > 1 M€

- **FIRB**: Detectors for Exotic Nuclear Matter
- **CaRiPaRo**: CONPHYT (condensed states for nuclear physics)
- ENSAR/ENSAR 2: nuclear spectroscopy and instrumentation
- PRIN: new detectors for SPES

	2013	2014
Publications	49	158
Conferences	<b>23</b> (82)	<b>27</b> (83)
Thesis	<b>3 S + 3 PhD</b> (23)	<b>1 S + 3 T</b> (21)