



# WORKSHOP AGATA@LNL FOR STABLE BEAMS

INFN, LABORATORI NAZIONALI DI LEGNARO  
25-26 MARCH 2019

## SCIENTIFIC PROGRAMME

### Monday, 25 March 2019

- 8:00 - 9:00      **Registration**
- 9:00 - 9:30      **Welcome Address 30'**  
Speakers: Diego Bettoni (INFN LNL Director), Francesca Soramel (University of Padova, Dept. of Physics and Astronomy Director), Mauro Mezzetto (INFN Padova Director).
- 9:30 - 10:00    **Accelerator Status 30'**  
Speaker: Giovanni Bisoffi (INFN LNL)
- 10:00 - 11:30   **Session: NUCLEAR REACTIONS**  
Conveners: M. Caamaño (Santiago), S. Szilner (Zagreb), A. Goasduff (Padova)
- 10:00    **Introduction 5'**
- 10:05    **Neutron-rich heavy nuclei explored via multinucleon transfer reactions 15'**  
Speaker: Franco Galtarossa (INFN LNL)
- 10:20    **Studies of pair transfer processes 15'**  
Speaker: Tea Mijatovic (Ruder Boskovic Institute)
- 10:35    **Nuclear structure studies of n-rich actinides produced in  $^{238}\text{U}+^{238}\text{U}$  collisions with PRISMA+AGATA+LEPS 15'**  
Speaker: Dieter Ackermann (GANIL)
- 10:50    **Large- and positive-Q-value proton-transfer reactions with radioactive targets for nuclear structure studies 15'**  
Speaker: Simone Bottoni (University and INFN Milano)
- 11:05    **Low-energy heavy-ion fusion: the hindrance effect and consequences for stellar evolution (coupling an array of silicon detectors to the AGATA spectrometer) 15'**  
Speaker: Giovanna Montagnoli (University and INFN Padova)
- 11:20    **Discussion 10'**
- 11:30 - 11:55   **Coffee break**
- 11:55 - 13:30   **Session: LIGHT EXOTIC NUCLEI and ASTROPHYSICS**  
Conveners: B. Fernandez (Santiago), C. Wheldon (Birmingham), D. Mengoni (Padova)
- 11:55    **Introduction 5'**
- 12:00    **Lifetime measurements of excited states in neutron-rich C isotopes: a test of the three-body forces 15'**  
Speaker: Michal Ciemala (IFJ PAN Krakow)
- 12:15    **Onset of collectivization/clusterization in Oxygen neutron-rich nuclei 15'**  
Speaker: Sara Ziliani (University and INFN Milano)
- 12:30    **Establishing the properties of  $^{19}\text{Ne}$  cluster states important for X-ray bursts 15'**  
Speaker: Carl Wheldon (Birmingham University)
- 12:45    **Experimental study of the key system in advanced stage of stellar evolution  $^{16}\text{O}+^{16}\text{O}$  at E\_lab around 5 MeV, and its reaction channels; The Supersonic jet Gas Target SUGAR, an alternative to measure reactions with pure thin targets 20'**  
Speaker: Daniel Jose Marín Lámbarri (IFUNAM)

13:05 **Surrogate measurement of  $^{83}\text{Se}$  via  $^{82}\text{Se}(\text{d},\text{p})^{83}\text{Se}$  inverse kinematics** 15'

Speaker: Eda Sahin (Oslo University)

13:20 **Discussion** 10'

13:30 - 14:30 **Lunch**

14:30 - 16:50 **Session: NUCLEAR SHELL STRUCTURE**

Conveners: D. Verney (Orsay), P. Reiter (Köln), A. Gottardo (LNL)

14:30 **Introduction** 5'

14:35 **Neutron-rich nuclei in the vicinity of  $^{208}\text{Pb}$ ;**

**Multi-nucleon transfer reactions for production and study of heavy neutron rich nuclei relevant to the r-process nucleosynthesis** 20'

Speaker: Zolt Podolyak (Surrey University)

14:55 **Shell- and Shape Evolution with AGATA@LNL: a Short Potpourri of Small Ideas;**

**Shell evolution in the neutron-rich Cu and Zn isotopes in the vicinity of  $^{68}\text{Ni}$ ;**

**Deformed intruder band around  $Z=28$  from  $N=40$  to  $N=50$ : Lifetime measurements in  $^{67-75}\text{Cu}$ ;**

**Investigating the role of the proton  $g_{7/2}$  orbital in the structure of  $^{69}\text{Cu}$**  30'

Speaker: Joa Ljungvall (CSNSM-IN2P3/CNRS)

15:25 **In-beam gamma-ray spectroscopy of neutron-rich nuclei around  $N=50$  with fusion-fission reactions;**

**Shape coexistence in  $N=49$  isotones: large radius or large deformation?;**

**Structure investigation of  $^{96}\text{Mo}$  through lifetime measurements of excited states above 2 MeV** 25'

Speaker: Andrea Gottardo (INFN LNL)

15:50 **Direct lifetime measurements of the first excited  $2^+$  states of  $^{206}\text{Hg}$ ,  $^{202}\text{Pt}$  and  $^{210}\text{Pb}$**  15'

Speaker: Philipp Rudolf John (TU Darmstadt)

16:05 **Spectroscopy of n-rich Gd isotopes after multinucleon transfer reactions** 15'

Speaker: Caterina Michelagnoli (Institut Laue-Langevin)

16:20 **Lifetime measurements of excited states in odd-mass pseudo-mirror nuclei** 15'

Speaker: Bahadır Saygi (Ege University Turkey)

16:35 **Discussion** 10'

16:45 - 17:10 **Coffee break**

17:10 - 18:50 **Session: N=Z NUCLEI**

Conveners: A. Gadea (Valencia), J. Nyberg (Uppsala), F. Recchia (Padova)

17:10 **Introduction** 5'

17:15 **Collectivity in  $N\sim Z$  heavy nuclei** 15'

Speaker: Gilles de France (GANIL)

17:30 **Direct measurement of proton-neutron matrix elements with respect to the  $^{100}\text{Sn}$  core by studying excited states in  $^{100}\text{In}$**  15'

Speaker: Marcin Palacz (HIL Warsaw University)

17:45 **Exploring the robustness of  $N=Z=28$  via transfer reactions and lifetime measurements; The role of the  $g_{7/2}$  orbital in the development of deformation in the  $N=Z$  nucleus  $^{68}\text{Se}$**  20'

Speaker: Andres Gadea (IFIC CSIC - Valencia University)

18:05 **Isospin mixing in the mirror-pair nuclei with  $A=35$  and  $A=45$ ;**

**Isospin mixing in the  $A=63$  mirror nuclei** 20'

Speaker: Ana Montaner Pizá (INFN Padova)

18:25 **Model-independent measurement of isospin symmetry breaking** 15'

Speaker: Daniele Mengoni (University and INFN Padova)

18:40 **Discussion** 10'

20:30 - 22:30 **Workshop Dinner**

## Tuesday, 25 March 2019

9:00 - 10:55

### Session: HIGH-SPIN PHYSICS

Conveners: A. Korichi (Orsay), V. Werner (Darmstadt), G. Benzoni (Milano)

9:00 **Introduction** 5'

9:05 **New chiral geometry in triaxial nuclei;**

**Study of the phase transition phenomenon, band termination and chirality** 20'

Speaker: Elena Lawrie (iThemba LABS)

9:25 **Decay and deformation of the oblate and chiral bands in  $^{135,136,137}\text{Nd}$ ;**

**Search for chiral structures based on 1-particle-2-hole configurations in the A~100 region** 20'

Speaker: Costel Petrache (Paris Sud University)

9:45 **Investigation of a high spin structure in the vicinity of  $^{44}\text{Ti}$  via discrete and continuum gamma spectroscopy with AGATA+EUCLIDES+RFD and PARIS detectors** 15'

Speaker: Piotr Bednarczyk (IFJ PAN Krakow)

10:00 **Attacking the quasi-continuum with AGATA;**

**Study of super-deformed and hyper-deformed nuclei** 20'

Speaker: Amel Korichi (CSNSM-IN2P3/CNRS)

10:20 **Lifetime measurements of low-lying states in light actinides;**

**High-spin states and novel nuclear shapes in light-actinide nuclei;**

**Exotic Nuclei for EDM search: lifetime measurements in octupole deformed Ra and Th nuclei by multinucleon transfer** 25'

Speaker: Alain Goasduff (University and INFN Padova)

10:45 **Discussion** 10'

10:55 - 11:25

### Coffee break

11:25 - 13:05

### Session: NUCLEAR RESONANCES

Conveners: A. Maj (Krakow), A. Zilges (Koln), F. Crespi (Milano)

11:25 **Introduction** 5'

11:30 **Gamma strength functions and decay pattern of dipole excitations** 15'

Speaker: J. Isaak (TU Darmstadt)

11:45 **Gamma and Particle Decay of Giant Resonances Excited by Inelastic Scattering of  $^{17}\text{O}$  ions at 20 MeV/A;**

**Study of single-particle structure of pygmy dipole resonance** 20'

Speaker: Mateusz Krzysiek (IFJ PAN Krakow)

12:05 **The search for Jacobi shape transitions in hot rotating nuclei from the Mo-Ba region; GDR feeding of SD states: a LOI for AGATA@LNL** 20'

Speaker: Maria Kmiecik (IFJ PAN Krakow)

12:25 **Measurement of Isospin Mixing** 15'

Speaker: Giulia Gosta (University and INFN Milano)

12:40 **Study of the isovector giant dipole resonance in hot superheavy nuclei** 15'

Speaker: Marine Vandebrouck (CEA Saclay)

12:55 **Discussion** 10'

13:05 - 14:30

### Lunch

14:30 - 16:30

### Session: NUCLEAR SHAPES 1

Conveners: M. Zielinska (Saclay), B. Fornal (Krakow), A. Nannini (Firenze)

14:30 **Introduction** 5'

14:35 **Search for shape isomers by using near-barrier transfer reactions with AGATA at LNL; Low spin spectroscopy around  $^{190}\text{Pt}$  with the deep inelastic reaction  $^{58}\text{Ni}+^{190}\text{Pt}$ ; Lifetimes in the  $^{196}\text{Os}$  region populated in multi-nucleon transfer reactions** 25'

Speaker: Nicolae Marginean (IFIN-HH Bucharest)

15:00 **Multiple shape coexistence in stable Cd isotopes studied through Coulomb excitation with AGATA at LNL;**

**An Electron Conversion Spectrometer for AGATA: Study of the vibrational modes in stable Cd isotopes** 20'

Speaker: Katarzyna Wrzosek-Lipska (HIL - Warsaw University)

- 15:20 **Shape coexistence of  $^{96}\text{Zr}$  - Determination of the quadrupole moments  $Q(2^+_{1})$  and  $Q(2^+_{2})$**  15'  
Speaker: Volker Werner (TU Darmstadt)
- 15:35 **Coulomb excitation of the super-deformed structures in A~40 mass region (AGATA+SPIDER+PARIS at INFN LNL)** 15'  
Speaker: Katarzyna Hadynska-Klek (HIL - Warsaw University)
- 15:50 **Quadrupole, Octupole and Hexadecapole Collectivity in  $^{152}\text{Sm}$  Through Low-Energy Coulomb-Excitation; Onset of octupole deformation in very light Te isotopes** 20'  
Speaker: Marco Rocchini (INFN Firenze)

16:10 - 16:40 **Coffee break**

16:40 - 17:35 **Session: NUCLEAR SHAPES 2**

Conveners: M. Zielinska (Saclay), B. Fornal (Krakow), A. Nannini (Firenze)

- 16:40 **Probing the Z=50 shell closure - Lifetime measurements in  $^{110}\text{Sn}$  and  $^{111,113}\text{Sb}$  with AGATA+PRISMA; Collectivity evolution in Z~50 region: multi-step Coulomb excitation in stable Sn and Te nuclei** 20'  
Speaker: Marco Siciliano (CEA Saclay)
- 17:00 **Search for deformed structures in neutron-rich Nb isotopes by gamma spectroscopy and cluster transfer reaction** 15'  
Speaker: Lukasz Iskra (INFN Milano)
- 17:15 **Studies of shape coexistence in the neutron-deficient Po and Rn isotopes via plunger lifetime measurements with fusion-evaporation reactions** 15'  
Speaker: Francois Didierjean (IPHC - Strasbourg University)
- 17:30 **Discussion** 10'

17:40 - 18:30 General Discussion and Closure