



UNIVERSITÀ DEGLI STUDI
DI MILANO



IVth Topical Workshop on Modern Aspects in Nuclear Structure

The Many Facets of Nuclear Structure

BORMIO 19 - 25 February 2018

<http://www.mi.infn.it/WSBormio-Milano2018/>

Program

Monday 19th February

1 day Theory workshop

(Sala Congressi Bormio Terme-Via Stelvio 14)

9:20-9:30 **WELCOME**

CHAIR: T. Otsuka

9:30-10:10 *Linking structure and dynamics in (p, pN) reactions induced by exotic nuclei*
A. Moro (University of Sevilla)

10:10-10:50 *A dive into ab initio calculations with NCSM (RGM)*
G. Hupin (CNRS Orsay)

10:50-11:15 **COFFEE BREAK**

CHAIR: T. Otsuka

11:15-11:55 *Three-body model study of nuclei beyond drip line*
H. Sagawa (RIKEN and University of Aizu)

11:55-12:35 *Pygmy in deformed nuclei*
E. Lanza (INFN Catania)

12:35-14:20 **LUNCH**

CHAIR: M. Colonna

14:20-15:00 *Two-particle transfer reactions: a key tool for the study of phase transitions in nuclei*
A. Vitturi (University of Padova)

15:00-15:40 *Counting particles in microscopic systems*
C. Simenel (Australian National University)

15:40-16:20 *Structure calculations beyond mean-field and transfer reactions*
E. Vigezzi (INFN Milano)

16:20-16:45 **COFFEE BREAK**

CHAIR: M. Colonna

16:45-17:25 *Soft modes in the proton-neutron pairing channel as precursors of deuteron condensate in N=Z nuclei*
E. Litvinova (Western Michigan University)

17:25-18:05 *Transfer and double charge-exchange with heavy ions*
J. A. Lay (University of Sevilla)

18:05-18:30 **CONCLUDING REMARKS**

19:30 **Welcome Cocktail at Miramonti Park Hotel**

Tuesday 20th February
MORNING
(Sala Congressi Bormio Terme-Via Stelvio 14)

9:00-9:10 **WELCOME**

CHAIR: M. Lewitowicz

9:10-9:35 *Quantum Self-Organization and Nuclear Collectivity*
T. Otsuka (University of Tokyo and RIKEN)

9:35-10:00 *Coulomb excitation of doubly magic ¹³²Sn*
P. Reiter (University of Cologne)

10:00-10:25 *Recent beta-decay studies with the GRIFFIN spectrometer at TRIUMF-ISAC*
A. B. Garnsworthy (TRIUMF)

10:25-10:40 *In-beam γ -ray spectroscopy of ^{54,56}Ca (*)*
F. Browne (RIKEN)

10:40-11:00 *Prompt and delayed in-beam gamma-spectroscopy of neutron-rich krypton isotopes with $N \leq 60$*
A. Blazhev (University of Cologne)

11:00-11:20 COFFEE BREAK

CHAIR: H. Sakai

11:20-11:45 *Effects of tensor forces in nuclear spin-orbit splittings from ab initio calculations*
J. Meng (Peking University)

11:45-12:10 *Physics opportunities with isotopically identified fission fragments at VAMOS*
A. Lemasson (GANIL)

12:10-12:30 *Progress of the PARIS project*
A. Maj (IFJ PAN)

12:30-12:45 *Lifetime measurements of excited states in neutron-rich C and O isotopes - an experiment with the AGATA+PARIS+VAMOS setup (*)*
M. Ciemala (IFJ PAN)

12:45-13:00 *Statistical properties of ⁷⁰Ni within the shell model (*)*
J. Midtbo (University of Oslo)

13:00-14.30 LUNCH

Tuesday 20th February
AFTERNOON
(Sala Congressi Bormio Terme-Via Stelvio 14)

14:30-17:00 PARIS Collaboration meeting (open)

Report form the first AGATA-PARIS experiment (E676) performed at GANIL (30'):

- S. Brambilla (INFN Milano) PARIS Analogue Electronics & DAQ Setup.
- M. Ciemala (IFJ PAN Kraków) AGATA-PARIS-VAMOS trigger system: evaluation of the performance and limitations.
- S. Ziliani (INFN Milano) Preliminary analysis and data replay for the experiment E676 with AGATA+VAMOS+PARIS
- Discussion (30')

Application of digital electronics in AGATA-PARIS measurements (30'):

- P. Bednarczyk (IFJ PAN Kraków) Performance of the CAEN V1730 digitizer in acquiring energy and time spectra with *phoswich* detectors
- S. Brambilla (INFN Milano) Moving towards a digital acquisition system for PARIS.
- A. Czermak (IFJ PAN Kraków) Plans for building programmable trigger-interface for merging digital, distributed DAQs.
- Discussion (30')

CHAIR: J. Meng

- 17:15-17:40 *Nuclear structure studies based on energy density functionals*
T. Niksic (University of Zagreb)
- 17:40-18:05 *A Nilsson Approach to Spectroscopic Factors in the Islands of Inversion*
A. Macchiavelli (Lawrence Berkeley National Laboratory)
- 18:05-18:25 *Persistence of nuclear shell closures far from stability:
 γ spectroscopy of ^{79}Cu at RIKEN*
S. Franchou (IPN Orsay)
- 18:25-18:45 *Low spin structure studies of exotic states and nuclei*
P. Jones (iThemba LABS)
- 18:45-19:00 *Monte Carlo shell model calculations for structure of nuclei around $Z=28$ (*)*
Y. Tsunoda (University of Tokyo)
- 19:00-19:15 *β - γ spectroscopy for shape evolution of neutron-rich Mo isotopes (*)*
J. Ha (Seoul National University)
- 19:15-19:30 *Structural Evolution of Germanium Nuclei Below the $N=50$ Shell (*)*
A. Forney (University of Maryland College Park)

Wednesday 21st February

MORNING

(Sala Congressi Bormio Terme-Via Stelvio 14)

CHAIR: A. Görgen

- 8:50-9:15 *Decay Properties of Exotic Nuclei Surveyed at RIBF*
S. Nishimura (RIKEN)
- 9:15-9:40 *High Momentum Protons and Neutrons in Asymmetric Nuclei*
E. Piasezky (Tel Aviv University)
- 9:40-10:05 *Nuclear structure studies around ^{132}Sn via gamma and fast-timing spectroscopy*
L. M. Fraile (Universidad Complutense de Madrid)
- 10:05-10:25 *On the ab-initio derivation of covariant density functionals*
P. Ring (Technical University Munich)
- 10:25-10:45 *Experimental Possibilities for Nuclear Structure at the Tandem Laboratory in Bucharest*
N. Marginean (IFIN-HH)
- 10:45-11:00 *^{206}Po In-Beam FEST Measurements With The ROSPHERE Spectrometer (*)*
C. Costache (IFIN-HH)

11:00-11:20 COFFEE BREAK

CHAIR: A. Bruce

- 11:20-11:45 *Fission with radioactive beams*
A. Andreyev (University of York)
- 11:45-12:05 *Nuclear spectroscopy after slow-neutron induced reactions: the FIPPS instrument at ILL*
C. Michelagnoli (Institut Laue-Langevin)
- 12:05-12:25 *Nuclear Physics and Cosmological Lithium problem: results from the n_TOF facility at CERN*
M. Barbagallo (INFN Bari and CERN)
- 12:25-12:40 *γ -ray spectroscopy of ^{98}Mo using FIPPS instrument (*)*
J. Wisniewski (Faculty of Physics, University of Warsaw)
- 12:40-12:55 *Gamma spectroscopy of neutron-rich Sn isotopes near double-magic ^{132}Sn (*)*
L. Iskra (IFJ PAN)

13:00-14.30 LUNCH

Wednesday 21st February
AFTERNOON
(Sala Congressi Bormio Terme-Via Stelvio 14)

14:30-16:45 FIPPS meeting

Simone Bottoni	Milano University/INFN	<i>Spectroscopy of valence particle nuclei around ^{48}Ca and ^{132}Sn: recent results in Experiment and Theory (*)</i>	14:30	14:45
Natalia Cieplicka	IFJ-PAN, Krakow	<i>The proton-hole neutron-hole ^{206}Tl nucleus as a probe for shell-model realistic calculations (*)</i>	14:45	15:00
Fabio Crespi	Milano University/INFN	<i>Testing with FIPPS the Gamma Ray Emission Induced Doppler Shift technique</i>	15:00	15:15
Felix Kandzia	ILL, Grenoble	<i>Development of a Fission-Tagging Detector for FIPPS (*)</i>	15:15	15:30
Caterina Michelagnoli	ILL, Grenoble	<i>Open Problems in data analysis and Perspectives – Discussion</i>	15:30	16:45

CHAIR: A. Vitturi

- 17:00-17:25 *Heavy Ion charge exchange reactions and the link with beta decay processes*
M. Colonna (INFN LNS)
- 17:25-17:50 *Investigation of Z-Yield Distributions of Fission Fragments using Calorimetric Low Temperature Detectors*
P. Egelhof (GSI)
- 17:50-18:10 *The LICORNE campaign at ALTO*
M. Lebois (IPN Orsay)
- 18:10-18:25 *Fast-timing measurements in neutron-rich zirconium isotopes using LaBr₃:Ce detectors coupled with Gammasphere (*)*
E. Gamba (University of Brighton)
- 18:25-18:40 *Lifetime measurements in neutron-rich Ce isotopes (*)*
G. Fernandez (Technical University Darmstadt)
- 18:40-19:00 *Quantum equilibration dynamics from deep-inelastic collisions to fusion-fission*
C. Simenel (Australian National University)
- 19:00-19:20 *Deep-inelastic reactions and neutron rich nuclei production towards zero degrees*
G. I. Stefan (IPN Orsay)
- 19:20-19:35 *Microscopic description of nuclear fission for r-process nucleosynthesis (*)*
M. Shelley (University of York)

Thursday 22nd February

MORNING

(Sala Congressi Bormio Terme-Via Stelvio 14)

CHAIR: M. J. G. Borge

8:50-9:15 *Quantum Monte Carlo calculations of properties of nuclei with chiral interactions*

S. Gandolfi (Los Alamos National Laboratory)

9:15-9:40 *Being precise; new measurements of clustering in light nuclei*

C. Wheldon (University of Birmingham)

9:40-10:00 *Nuclear clustering probed by isoscalar responses*

M. Kimura (Hokkaido University)

10:00-10:20 *Strong neutron pairing in the core+4n ^{18}C and ^{20}C nuclei*

O. Sorlin (GANIL)

10:20-10:35 *Reactions with ^9Li beams at HIE-ISOLDE (*)*

J. Jensen (Aarhus University)

10:35-10:55 *Implementation of the AGFA and AIRIS separators at Argonne*

B. Back (Argonne National Laboratory)

10:55-11:15 COFFEE BREAK

CHAIR: P. Ring

11:15-11:40 *Delayed particle spectroscopy with optical TPC*

M. Pfutzner (University of Warsaw)

11:40-12:05 *Proton drip line walker*

F. De Oliveira (GANIL)

12:05-12:25 *Using Isospin Symmetry to understand proton rich nuclei*

B. Rubio (IFIC)

12:25-12:45 *Formation of Low-energy Super Gamow-Teller states*

Y. Fujita (RCNP)

12:45-13:05 *Total Absorption Spectroscopy for nuclear astrophysics applications: present a future prospects*

E. Nacher (CSIC Madrid)

13:05-14.30 LUNCH

Thursday 22nd February
AFTERNOON
 (Sala Congressi Bormio Terme-Via Stelvio 14)

14:30-16:45 SPES meeting

Albergo Andrighetto	Legnaro Laboratory/INFN	<i>Production of Radioactive Ion Beams at SPES</i>	14:30	15:00
Giovanna Benzoni	INFN-Milano	<i>New instrumentation at SPES</i>	15:00	15:30
Javier Valiente- Dobon	Legnaro Laboratory/INFN	<i>AGATA@SPES</i>	15:30	16:00
<i>Discussion</i>		<i>AGATA@SPES White Book preparation</i>	16:15	16:45

CHAIR: R. Raabe

- 17:00-17:25 *Realistic shell-model calculations of the neutrinoless double-beta decay matrix element of medium-mass nuclei*
 L. Coraggio (INFN Napoli)
- 17:25-17:50 *Beta-NMR and gamma-MRI: from nuclear physics to biology and medicine*
 M. Kowalska (CERN)
- 17:50-18:10 *Recent applications of ISOLTRAP's multi-reflection time-of-flight mass separator/spectrometer (MR-ToF MS) and the development of a dedicated ISOLDE MR-ToF*
 F. Wienholtz (CERN)
- 18:10-18:30 *(Fluorescence Detection based) Collinear Laser Spectroscopy at ISOLDE: Recent Highlights and Future Developments*
 S. Malbrunot-Ettenauer (CERN)
- 18:30-18:45 *Shape coexistence in gold, mercury and bismuth isotopes studied by in-source laser spectroscopy at RILIS-ISOLDE (*)*
 J. Cubiss (University of York)
- 18:45-19:00 *First Observation of the Low-Spin Structure of ^{213}Fr Populated in the EC/β^+ Decay of ^{213}Ra (*)*
 C. Clisu (ELI-NP and IFIN-HH)
- 19:00-19:15 *Study of transfer to the bound states and resonance of ^{11}Be via the $^{10}\text{Be}(d,p)$ reaction using the ADWA method (*)*
 J. Yang (KUL ULB)
- 19:15-19:30 *Time-dependent few-body model for nuclear meta-stable systems (*)*
 T. Oishi (University of Padova)

Friday 23rd February

MORNING

(Sala Congressi Bormio Terme-Via Stelvio 14)

CHAIR: P. Egelhof

- 8:50-9:15 *Nuclear Schiff and octupole moments of the actinides*
J. Dobacewski (University of York)
- 9:15-9:40 *On the road towards a Nuclear Clock: What do we know about ^{229m}Th ?*
P. Thirolf (Ludwig-Maximilians-University Munich)
- 9:40-10:00 *Beyond-mean-field boson-fermion model for odd nuclei*
K. Nomura (University of Zagreb)
- 10:00-10:15 *A first direct nuclear laser excitation scheme for ^{229m}Th (*)*
L. von der Wense (Ludwig-Maximilians-University of Munich)
- 15-10:30 *Internal Conversion Electron Spectroscopy of ^{229m}Th (*)*
B. Seiferle (LMU Munich)
- 10:30-10:55 *Opportunities of nuclear physics with 10 PW lasers*
F. Negoita (ELI-NP / IFIN-HH)

10:55-11:20 COFFEE BREAK

CHAIR: B. Fornal

- 11:20-11:40 *Unified nuclear structure and reactions: from ab-initio to EDF*
G. Hupin (CNRS Orsay)
- 11:40-12:05 *Understanding effect of tensor interactions in light nuclei via high momentum neutron-transfer reactions*
H. J. Ong (RCNP)
- 12:05-12:25 *Studies of exotic nuclear structure performed by the MAGISOL collaboration at ISOLDE and HIE-ISOLDE*
O. Tengblad (CSIC Madrid)
- 12:25-12:40 *Isospin dependence of high-momentum components in nuclei (*)*
L. Yu (Beihang University)
- 12:40-12:55 *Electron Capture of ^8B into highly excited states of ^8Be (*)*
S. Vinals (CSIC Madrid)

12:55-14.30 LUNCH

Friday 23rd February
AFTERNOON
(Sala Congressi Bormio Terme-Via Stelvio 14)

14:30-16:45 AGATA@SPES White book meeting (open)

<i>Working Group</i> <i>Discussion</i>	<i>AGATA@SPES White Book preparation</i>	14:30	16:45
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CHAIR: A. Nannini

- 17:00-17:25 *Gamma spectroscopy at LNL: the GALILEO campaign*
D. Mengoni (University of Padova and INFN Padova)
- 17:25-17:40 *First measurement with a new setup for low-energy Coulomb excitation studies at INFN LNL (*)*
M. Rocchini (University of Florence and INFN Florence)
- 17:40-17:55 *Spectroscopic investigation of low-lying $T=0, 1$ states in ^{62}Ga (*)*
R. E. Mihal (IFIN HH)
- 17:55-18:15 *Decay spectroscopy of very heavy and superheavy nuclei*
D. Ackerman (GANIL)
- 18:15-18:30 *Production cross-sections of ^{243}Es and ^{249}Md : reaction mechanism towards the spectroscopy of SHN*
M. Vandebrouck (CEA Saclay)
- 18:30-18:50 *Recent investigations of excited states in heavy nuclei*
B. Sulignano (CEA Saclay)
- 18:50-19:05 *Search of rare reaction channels with proton evaporation*
M. Tezekbayeva (JINR) (*)
- 19:05-19:25 *Perspectives of the new Fragment In-flight Separator at INFN-LNS*
P. Russotto (INFN LNS)

Saturday 24th February
MORNING

(Sala Congressi Bormio Terme-Via Stelvio 14)

CHAIR: J. Dobaczewsky

8:50-9:15 *CAGRA+GR Campaign Experiments at RCNP*
A. Tamii (RCNP)

9:15-9:40 *NeuLAND@SAMURAI campaign*
D. Rossi (Technical University Darmstadt)

9:40-10:05 *Ab initio calculations of scattering and nuclear response*
C. Barbieri (University of Surrey)

10:05-10:25 *Isomer ratios in Fe Region by Projectile Fragmentation: towards an experiment of Gamow-Teller excitation built on isomeric state*
H. Sakai (RIKEN)

10:25-10:45 *Current topics of spin-isospin responses*
H. Sagawa (University of Aizu and RIKEN)

10:45-11:00 *Photo-neutron cross sections, γ -ray strength functions and (n, γ) cross sections of Dy isotopes (*)*
T. Renstrom (University of Oslo)

11:00-11:20 COFFEE BREAK

CHAIR: E. Lanza

11:20-11:45 *Nuclear physics activity at Oslo cyclotron (to be confirmed)*
S. Siem (University of Oslo)

11:45-12:10 *Untangling broad structures and states with ancillary detectors in coincidence with the K600 spectrometer*
F. Smit (iThemba LABS)

12:10-12:30 *Relativistic time blocking approximation at finite temperature: first applications*
E. Litvinova (Western Michigan University)

12:30-12:45 *Exploring the Pygmy Dipole Resonance in deformed nuclei (*)*
L. Pellegri (University of Witwatersrand and iThemba LABS)

12:45-13:00 *Observation of the Pygmy Dipole Resonance in the ^{68}Ni nucleus over the threshold for particle decay (*)*
N. S. Martorana (INFN LNS)

13:00-17:00 LUNCH AND FREE TIME

Saturday 24th February
AFTERNOON
(Sala Congressi Bormio Terme-Via Stelvio 14)

CHAIR: **A. Maj**

- 17:00-17:25 *Shell model description of heavy nuclei and abnormal collective motions*
C. Qi (KTH Stockholm)
- 17:25-17:50 *Study of low-lying states in unstable oxygen isotopes using isoscalar and isovector probes*
H. Baba (RIKEN)
- 17:50-18:05 *Charge-exchange and weak-interaction processes within relativistic nuclear field theory (*)*
C. Robin (University of Washington)
- 18:05-18:20 *First measurements of collective excitations in stable nuclei induced by proton beam at CCB Krakow (*)*
B. Wasilewska (IFJ PAN)
- 18:20-18:35 *Measurement of gamma decay from the isovector giant dipole resonances for the study of their fine structure (*)*
S. Nakamura (RCNP)
- 18:35-19:00 *Decay spectroscopy of deformed, neutron-rich nuclei in the light rare-earth region*
F. Kondev (Argonne National Laboratory)

19:00-19:15 CLOSING

20:30 Conference Dinner at Miramonti Park Hotel

*During the Conference Dinner the **two best talks** of young speakers (marked by * in the program) will be rewarded with cash prizes given by our sponsor CAEN: one on technical developments and one on physics.*