

Shapes and Symmetries in Nuclei: from Experiment to Theory (SSNET'18)

5 Nov 2018, 08:30 → 9 Nov 2018, 17:30 Europe/Paris

Organizing committee: Costel Petrache (chair), Jerzy Dudek (co-chair),
Alain Astier, Isabelle Deloncle, Étienne Dupont, Amel Korichi, Radomira Lozeva, BingFeng Lv

Conference secretary: Émilie Bonnardel



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CONFERENCE PROGRAM

MONDAY, 5 NOVEMBER
(PLACE: I2BC AUDITORIUM, BUILDING #21)

08:30 → 09:00 Registration

09:00 → 09:10 Opening session

Chair: Costel Petrache (CSNSM Orsay and Université Paris-Saclay)

09:00 **Welcome** 10m
Speakers: Étienne Augé (Université Paris-Saclay), Jean-Antoine Scarpaci (CSNSM Orsay)

09:10 → 10:50 Transitional Nuclei 1

Chair: Richard F Casten (Yale University and FRIB, Michigan State University)

09:10 **Partial dynamical symmetries for transitional nuclei** 25m
Speaker: Amiram Leviatan (Racah Institute of Physics, The Hebrew University)

09:35 **On shape coexistence and quantum phase transitions: Lead and Zirconium regions** 25m
Speaker: José Enrique García-Ramos (University of Huelva)

10:00 **Overview of Proxy-SU(3)** 25m
Speaker: Richard F Casten (Yale University and FRIB, Michigan State University)

10:25 **Predictions of Proxy-SU(3) for γ -band to ground band B(E2)-values** 25m
Speaker: R. Burcu Cakirli (Istanbul University)

10:50 → 11:15

Coffee break

11:15 → 12:55 Transitional Nuclei 2

Chair: Richard F Casten (Yale University and FRIB, Michigan State University)

11:15 **Transfer reactions in transitional regions** 25m
Speaker: Andrea Vitturi (Dipartimento di Fisica e Astronomia Padova)

11:40 **Shape coexistence and collective low-spin states in $^{112,114}\text{Sn}$ studied with the (p,p' γ) DSA coincidence technique** 25m
Speaker: Mark Spieker (NSCL/Michigan State University)

12:05 **Shape evolution in neutron-rich Zr isotopes** 25m
Speaker: Purnima Singh (IRFU, CEA, Université Paris-Saclay)

12:30 **Interplay between shape coexistence and QPT in Zirconium isotopes** 15m
Speaker: Noam Gavrielov (Racah Institute of Physics, The Hebrew University of Jerusalem)

12:55 → 14:00

Lunch (CNRS restaurant)

14:00 → 15:40

Density Functional Theory 1

Chair: Jie Meng (School of Physics, Beijing University)

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|-------|---|-----|
| 14:00 | Recent progress of nuclear dynamics studies with TDDFT
Speaker: Kazuyuki Sekizawa (Institute for Research Promotion, Niigata University) | 25m |
| 14:25 | Super- and hyper-heavy nuclei in CDFT: recent results
Speaker: Anatoli Afanasjev (Mississippi State University) | 25m |
| 14:50 | Quadrupole shape fluctuations in nuclei and collective Hamiltonian method within Skyrme EDF
Speaker: Kouhei Washiyama (University of Tsukuba) | 25m |
| 15:15 | Relativistic effects in triggering the N=34 magic shell of Ca-54
Speaker: Wen Hui Long (School of Nuclear Science and Technology, Lanzhou University) | 25m |

15:40 → 16:00

Coffee break

16:00 → 18:30

Density Functional Theory 2

Chair: Jie Meng (School of Physics, Beijing University)

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|-------|--|-----|
| 16:00 | Properties of ^{229}Th within the state-of-the-art nuclear DFT calculations
Speaker: Jacek Dobaczewski (University of York) | 25m |
| 16:25 | Toroidal mode in nuclei
Speaker: Jan Kvasil (Institute for Particle and Nuclear Physics, Charles University, Prague) | 25m |
| 16:50 | IMME within isospin-symmetry-breaking DFT
Speaker: Wojciech Satula (University of Warsaw) | 25m |
| 17:15 | High-K isomers in rare-earth neutron-rich nuclei by PNC-CSM method
Speaker: Xiao-Tao He (Nanjing University of Aeronautics and Astronautics) | 25m |
| 17:40 | Multiple chiral doublets in four-j shells particle rotor model: five possible chiral doublet bands in ^{136}Nd
Speaker: Qibo Chen (Technische Universität München) | 25m |
| 18:05 | Applications of equation of motion phonon method in various neutron-rich Oxygen and Calcium isotopes
Speaker: Petr Vesely (Nuclear Physics Institute, Czech Academy of Sciences) | 25m |

18:30 → 21:00

Welcome cocktail (CNRS restaurant)

TUESDAY, 6 NOVEMBER
(PLACE: CHATEAU)

09:00 → 10:40

Experiment 1

Chair: Philip Walker (University of Surrey)

09:00 **Nuclear structure of the transitional Xe isotopes from density inelastic neutron scattering functionals**

Speaker: Steven Yates (University of Kentucky)

09:25

Studies of semi-magic Tin nuclei using large γ -ray spectrometers

Speaker: Corina Andreoiu (Simon Fraser University)

09:50

New insights on evolution of collectivity in the vicinity of ^{168}Os

Speaker: Tuomas Grahn (University of Jyväskylä)

10:15

Coriolis Mixing in 2-qp isomer in ^{164}Gd and other $N=100$ isotones

Speaker: Laurent Gaudefroy (CEA)

Theory 1

Chair: Jacek Dobaczewski (University of York)

Single-particle levels in cluster potentials

25m

Speaker: Roelof Bijker (ICN-UNAM)

A beyond-mean-field description for nuclear excitation spectra: applications of the subtracted second random-phase approximation

25m

Speaker: Marcella Grasso (IPN Orsay)

Calculations of isospin triplet states in the mass $A\sim 60-80$ region

25m

Speaker: Ramon Wyss (KTH, Royal Institute of Technology)

New results for odd nuclei: theoretical assessment and extensions of the Hybrid Configuration Mixing model

25m

Speaker: Gianluca Colò (Dipartimento di Fisica, Università degli Studi, and INFN Milano)

10:40 → 11:05

Coffee break

11:05 → 12:45

Experiment 2

Chair: Magdalena Górska (GSI Darmstadt)

11:05 **Tri-axiality in ^{110}Ru from Coulomb excitation**

Speaker: Daniel Doherty (University of Surrey)

11:30

Spectroscopy of neutron-rich Ca and Ni isotopes with SEASTAR

Speaker: Pieter Doornenbal (RIKEN)

11:55

Test of the $N=50$ neutron gap in the vicinity of ^{78}Ni and systematics of neutron-rich Ge nuclei

Speaker: François Didierjean (IPHC - Strasbourg University)

Theory 2

Chair: Philippe Quentin (CENBG)

Octupole vibrations in super-heavy nuclei and K-mixing for isomeric states with the QRPA formalism

25m

Speaker: Sophie Péru (CEA)

Fine structure of β -decay strength function in spin-isospin $SU(4)$ symmetry, and $SU(4)$ region

25m

Speaker: Igor Izosimov (Joint Institute for Nuclear Research)

Competition between the tetrahedral and octahedral symmetry deformations in exotic nuclei

25m

Speaker: Irene Dedes (Uniwersytet Marii Curie-Skłodowskiej)

12:20	Neutron-rich nuclei with $N \geq 126$ Speaker: Zsolt Podolyak (University of Surrey)	Linear response formalism for finite-range interactions and finite-size instabilities Speaker: Dany Davesne (IPN Lyon)	25m
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12:45 → 14:00

Lunch (CNRS restaurant)

14:00 → 15:40

Theory 3	Chair: Marcella Grasso (IPN Orsay)	Experiment 3	Chair: Roderick Clark (Lawrence Berkeley National Laboratory)
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14:00	Nuclear shapes for the critical point of the U(5)-SU(3) nuclear shape phase transition Speaker: Petrica Baganu (IFIN)	t-bands in the mass $A \sim 130$ region Speaker: Philip Walker (University of Surrey)	25m
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14:25	Symmetry adapted SU(3) no-core shell model with importance sampling Speaker: Frantisek Knapp (Charles University)	Towards ultra-cold gases of Caesium, progress and perspectives Speaker: Ferruccio Renzoni (University College London)	25m
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14:50	Shape coexistence in neutron deficient Hg isotopes Speaker: Alessandro Pastore (University of York)	Study of super-deformation in ^{42}Ca with Coulomb excitation Speaker: Kasia Hadyńska (University of Surrey)	25m
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15:15	Nuclear structure and dynamics from ab initio theory Speaker: Petr Navrátil (TRIUMF)	Nuclear structure studies at IGISOL Speaker: Anu Kankainen (University of Jyväskylä)	25m
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15:40 → 16:00

Coffee break

16:00 → 18:30

Theory 4	Chair: Jerzy Dudek (IPHC and Université de Strasbourg)	Experiment 4	Chair: Costel Petrache (CSNSM Orsay, Université Paris Sud)
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16:00	Quantum phase transitions and shape evolution in nuclei Speaker: Takaharu Otsuka (University of Tokyo)	Studying rotational bands in triaxial nuclei with quasiparticle-rotor model Speaker: Elena Lawrie (iThemba LABS)	25m
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16:25	Coexistence phenomena in neutron-rich $A \sim 100$ nuclei within the beyond-mean-field approach Speaker: Alexandrina Petrovici (IFIN-HH)	Triaxiality, octupole correlation, and pseudo-spin symmetry in ^{131}Ba Speaker: Song Guo (Institute of Modern Physics)	25m
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16:50	Point symmetry and nuclear octupole bands Speaker: Nikolay Minkov (Institute for Nucl. Research and Nucl. Energy)	The DESPEC project at GSI/FAIR Speaker: Magdalena Górska (GSI Darmstadt)	25m
17:15	Shape transition with temperature of the pear-shaped nuclei in covariant density functional theory Speaker: Wei Zhang (Zhengzhou University)	Study of exotic excitations in nuclei near spherical and deformed shell gaps using INGA Speaker: Gopal Mukherjee (Variable Energy Cyclotron Centre)	25m
17:40	Configuration assignments for the extensive level scheme of ^{167}Lu Speaker: Ingemar Ragnarsson (Lund University)	Recent experiments performed with GRETINA Speaker: Dirk Weisshaar (NSCL/Michigan State University)	25m
18:05	Nuclear structure studies based on energy density functionals Speaker: Tamara Niksic (University of Zagreb)	First spectroscopy of ^{40}Mg Speaker: Heather Crawford (Lawrence Berkeley National Laboratory)	25m

18:30 → 21:00

Poster session - Cocktail (Chateau)

Shapes and structures of Xe isotopes: Coexistence of single particle and collective modes of excitations Ranabir Banik (Variable Energy Cyclotron Centre)	Investigation of the nuclear structure of lowest ^{229}Th states Pierre Becker (University of York)
Exploring the highly-deformed band structures in ^{123}Xe Anwesha Basu (Indian Institute of Technology Kharagpur)	Configuration-constrained potential energy surface calculations of high-K states Guoxiang Dong (School of Science, Huzhou University)
Angular Correlation measurements with the iThemba LABS segmented clover detector Thifhelimbilu Daphney Bucher (iThemba LABS)	Nuclear structure of long lived isomer of ^{217}Pa using the QPRM model Mohamed Mouadil (Université Hassan II)
Structure of neutron-rich N=46 and N=48 isotones Anne Forney (University of Maryland College Park)	Resonances and halos in exotic nuclei in covariant density functional theory with Green's function method Tingting Sun (Zhengzhou University)
A new method for calibrating two-dimensional $\Delta E-E$ without radioactive source Ren Li (CSNSM Orsay)	A microscopic treatment of correlated nucleons: Collective properties in stable and exotic nuclei Olivier Vasseur (IPN Orsay)
Chirality in the even-even nucleus ^{136}Nd Bingfeng Lv (CSNSM Orsay)	Dynamic chirality in nuclear physics Mariya Yavahchova (Institute for Nuclear Research and Nuclear Energy)
High-spin level structure of the near-spherical nucleus ^{95}Tc Kuankuan Zheng (CSNSM Orsay)	Matter distribution studies of Carbon isotopes ^{9-22}C Said Boudhaim (Université Hassan II)
Experimental study of the lifetime in Neutron-rich nuclei around mass 100 Saba Ansari (CEA Saclay)	Nuclear structure studies close to shell closure N=126 using quasiparticle-phonon plus rotor method Youssra Elabssaoui (Université Hassan II)

WEDNESDAY, 7 NOVEMBER
(PLACE: I2BC AUDITORIUM, BUILDING #21)

09:00 → 10:30

Fission 1

Chair: Katsuhisa Nishio (JAEA Tokai)

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|-------|--|-----|
| 09:00 | The SOFIA experiments on fission yields: recent results and perspectives
Speaker: Laurent Audouin (IPN Orsay, Université Paris-Sud) | 25m |
| 09:25 | Fission dynamics of Fermium isotopes using Langevin equations
Speaker: Yoshihiro Aritomo (Kindai University) | 25m |
| 09:50 | Fission in inverse kinematics: a new window to experimental observables
Speaker: Manuel Caamaño (Universidade de Santiago de Compostela) | 25m |
| 10:15 | Fission studies using multi-nucleon transfer reactions
Speaker: Katsuhisa Nishio (JAEA Tokai) | 15m |

10:30 → 10:55

Coffee break

10:55 → 12:45

Fission 2

Chair: Katsuhisa Nishio (JAEA Tokai)

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|-------|---|-----|
| 10:55 | Electron-capture delayed fission in the heaviest nuclei
Speaker: Khuyagbaatar Jadambaa (GSI) | 25m |
| 11:20 | Shapes and symmetries in fission of (super) heavy nuclei
Speaker: Michal Kowal (NCBJ) | 25m |
| 11:45 | Fission study project in RIKEN RIBF: towards the complete measurement of fission observables
Speaker: Masaki Sasano (RIKEN) | 25m |
| 12:10 | Semiclassical origin of the asymmetric nuclear fission - The pre-fragment shell effect in the periodic-orbit theory
Speaker: Ken-ichiro Arita (Nagoya Institute of Technology) | 25m |
| 12:35 | Correlation between the average number of emitted neutrons and the mass yield of fragments from thermal neutron induced fission of ^{235}U
Speaker: Modesto Montoya Zavaleta (Universidad Nacional de Ingenieria, Lima) | 20m |

12:55 → 14:15

Lunch (CNRS restaurant)

15:00 → 23:00

Social program

15:00: Bus to Paris

16:00: Bateaux mouches excursion (Paris)

19:30: Conference dinner (Paris) 22:00 Bus to Gif-sur-Yvette

THURSDAY, 8 NOVEMBER
(PLACE: I2BC AUDITORIUM, BUILDING #21)

09:00 → 10:40

Heavy Nuclei 1

Chair: Paul Greenlees (University of Jyväskylä)

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|-------|---|-----|
| 09:00 | Decay-spectroscopy and lifetime measurements of super-heavy nuclei
Speaker: Araceli Lopez-Martens (CSNSM Orsay) | 25m |
| 09:25 | Nuclear structure of N>150 Pu-Cf nuclei and outlook with AGFA
Speaker: Partha Chowdhury (University of Massachusetts Lowell) | 25m |
| 09:50 | Shape coexistence studies at JYFL and ISOLDE
Speaker: Janne Pakarinen (University of Jyväskylä) | 25m |
| 10:15 | Charge radii in the region of Au-Po at ISOLDE
Speaker: James Cubiss (University of York) | 25m |

10:40 → 11:00

Coffee break

11:00 → 13:05

Heavy Nuclei 2

Chair: Michael Block (GSI/HIM/JGU)

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|-------|---|-----|
| 11:00 | Ground-state rotational bands in even-even heavy and super-heavy nuclei
Speaker: Krzysztof Pomorski (Maria Curie Skłodowska University) | 25m |
| 11:25 | Alpha decay and fission of high-K isomers
Speaker: Roderick Clark (Lawrence Berkeley National Laboratory) | 25m |
| 11:50 | Nuclear properties of Nobelium isotopes from laser spectroscopy
Speaker: Sebastian Raeder (GSI Darmstadt) | 25m |
| 12:15 | Mass measurements of heavy elements at GARIS
Speaker: Michiharu Wada (KEK) | 25m |
| 12:40 | Nuclear semi-bubbles in the heaviest elements
Speaker: Bastian Schütrumpf (TU Darmstadt / GSI) | 25m |

13:05 → 14:15

Lunch (CNRS restaurant)

14:15 → 15:55

Shell Model 1

Chair: Takaharu Otsuka (University of Tokyo)

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|-------|---|-----|
| 14:15 | Extending applicability of large-scale shell-model calculations
Speaker: Yutaka Utsuno (JAEA Tokai) | 25m |
| 14:40 | Continuum shell model for nuclear structure and reactions
Speaker: Marek Płoszajczak (GANIL) | 25m |

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|-------|---|-----|
| 15:05 | <p>Nuclear matrix elements to unveil the nature of neutrinos and dark matter</p> <p>Speaker: Javier Menéndez (University of Tokyo)</p> | 25m |
| 15:30 | <p>Structure of neutron-rich nuclei via nuclear force and microscopic theory</p> <p>Speaker: Naofumi Tsunoda (University of Tokyo)</p> | 25m |

15:55 → 16:15

Coffee break

16:15 → 17:45

Shell Model 2

Chair: Takaharu Otsuka (University of Tokyo)

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|-------|---|-----|
| 16:15 | <p>Shell model description of dipole strength at low energy and its impact on reaction rates</p> <p>Speaker: Kamila Sieja (IPHC - Strasbourg University)</p> | 25m |
| 16:40 | <p>Seniority and the Pandya relation</p> <p>Speaker: Piet Van Isacker (GANIL)</p> | 25m |
| 17:05 | <p>Nuclear shell model starting from deformed bases</p> <p>Speaker: Yang Sun (Shanghai Jiao Tong University)</p> | 25m |
| 17:30 | <p>Nuclear shape isomers and shell model</p> <p>Speaker: Bogdan Fornal (IFJ PAN)</p> | 25m |

FRIDAY, 9 NOVEMBER
(PLACE: I2BC AUDITORIUM, BUILDING #21)

09:00 → 10:40

Shapes and Shape Coexistence 1

Chair: Paul Garrett (University of Guelph)

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|-------|---|-----|
| 09:00 | <p>Investigation of the N=60 shape transition with low-energy Coulomb excitation</p> <p>Speaker: Magda Zielińska (CEA Saclay)</p> | 25m |
| 09:25 | <p>Deformation and shape coexistence studied with the Coulomb excitation in neutron-deficient Po and Hg isotopes</p> <p>Speaker: Katarzyna Wrzosek-Lipska (Heavy Ion Laboratory, University of Warsaw)</p> | 25m |
| 09:50 | <p>Shapes of neutron-rich Mo-Ru isotopes from Coulex and β-decay at CARIBU</p> <p>Speaker: Mitch Allmond (ORNL)</p> | 25m |
| 10:15 | <p>Study of shape co-existence in mass A~40 region</p> <p>Speaker: Eiji Ideguchi (RCNP, Osaka University)</p> | 25m |

10:40 → 11:00

Coffee break

11:00 → 13:05

Shapes and Shape Coexistence 2

Chair: Paul Garrett (University of Guelph)

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|-------|--|-----|
| 11:00 | Coulomb excitation at Legnaro with SPIDER and opportunities at SPES
Speaker: Adriana Nannini (INFN Firenze) | 25m |
| 11:25 | Coulomb excitation studies at TRIUMF-ISAC
Speaker: Jack Henderson (Lawrence Livermore National Laboratory) | 25m |
| 11:50 | Investigation of the octupole degree of freedom with Coulomb excitation
Speaker: Liam Gaffney (CERN) | 25m |
| 12:15 | New aspects of shape coexistence in nuclei
Speaker: John Wood (School of Physics, Georgia Institute of Technology) | 25m |
| 12:40 | Multiple shape coexistence in the Cadmium isotopes
Speaker: Paul Garrett (University of Guelph) | 25m |

13:05 → 14:15

Lunch (CNRS restaurant)

14:15 → 14:55

Various Issues 1

Chair: Marcella Grasso (IPN Orsay)

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|-------|---|-----|
| 14:15 | Precision laser spectroscopy for nuclear structure studies
Speaker: Ronald Fernando Garcia Ruiz (CERN) | 25m |
| 14:40 | From Quark Correlations to Nuclear Drip line
Speaker: Genis Musulmanbekov (JINR, LIT) | 25m |
| 15:05 | Predicting neutron capture cross-sections from nuclear masses
Speaker: Aaron Couture (Los Alamos National Laboratory) | 25m |

15:30 → 15:50

Coffee break

15:50 → 17:05

Various Issues 2

Chair: Costel Petrache (CSNSM Orsay and Université Paris-Saclay)

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|-------|---|-----|
| 15:50 | New Accelerator Center in Sofia: Present Status and Future
Speaker: Dimitar Tonev (Institute for Nuclear Research and Nuclear Energy) | 25m |
| 16:15 | A new symmetry of shapes, shells, and clusters
Speaker: Jozsef Cseh (MTA ATOMKI Debrecen) | 25m |
| 16:40 | Poster presentations
Speaker: () | 25m |

17:05 → 17:15

Closing

Chair: Costel Petrache (CSNSM Orsay and Université Paris-Saclay) , Jerzy Dudek (IPHC and Université de Strasbourg)