

SSNET'22
International Conference on Shapes and Symmetries in Nuclei:
from Experiment to Theory
May 30 - June 3, 2022, Orsay, Paris Region, France

Scientific Program

Monday, May 30, 2022

8:30 – 9:00

Registration

09:00 – 9:10

Opening Session

SESSION 1 – Recent achievements in the study of proton emitters

Chair: **Dariusz Seweryniak** (ANL, USA)

09:10 - 09:30

Jerome Giovinazzo (IN2IB, Bordeaux, France): Imaging ^{54m}Ni radioactivity with ACTAR TPC

09:35 - 09:55

Dan Doherty (University of Surrey, UK): Solving the puzzles of the decay of the heaviest known proton-emitting nucleus ^{185}Bi

10:00 - 10:20

Kalle Auranen (Jyväskylä University, Finland): Probing proton emitters using the MARA separator

10:25 - 10:45

Paramasivan Arumugam (IIT Roorkee, India): Microscopic description of tri-axially deformed odd-odd proton emitters

10:50 - 11:15 Coffee break

SESSION 2 – The science and impact of Bent Herskind (1931 - 2021)

Chair: **Mark Riley** (Florida State University, USA)

11:15 - 11:25

Mark Riley (Florida State University, USA): Introduction and early days when Bent helped trigger the Modern Revolution in Gamma-Ray Spectroscopy and Nuclear Structure Physics

11:25 - 11:55

Adam Maj (IFJ PAN Krakow, Poland): A quest for nuclear Jacobi shapes: the impact of Bent Herskind on theory and instrumentation developments

12:00 - 12:30

Silvia Leoni (University of Milan, Italy): Warm nuclei at high spin: the pioneering multi-dimensional vision of Bent Herskind

12:35 - 13:05

Jonathan Wilson (IJClab Orsay, France): exploring the extremes of nuclear deformation in Denmark and elsewhere

13:10 - 13:15

Mark Riley (Florida State University, USA): Further remembrances and a photo slide show

13:15 - 14:30 Lunch

SESSION 3 – Spectroscopy of heavy and super-heavy nuclei

Chair: **Dieter Ackermann** (GANIL, France)

14:40 - 15:00

Christoph Theisen (CEA Saclay, France): Spectroscopy of the deformed $^{249,251}\text{Md}$

15:05 - 15:25

Stanislav Antalic (Comenius University Bratislava, Slovakia): Decay spectroscopy of isotopes above Fermium

15:30 - 15:50

Michal Kowal (NCBJ Warsaw, Poland): Candidates for long-lived high-K ground states and isomers in superheavy nuclei

15:55 - 16:15

Dariusz Seweryniak (ANL, USA) Spectroscopy of deformed trans-fermium nuclei using the Argonne Gas-Filled Analyser

16:20 - 16:30

Jacklyn Gates (LBNL, USA): Superheavy Elements with FIONA (*remote*)

16:35 - 17:00 Coffee break

SESSION 4 – Advances in β -decay spectroscopy

Chair: **Adam Garnsworthy** (TRIUMF, Canada) (*remote*)

17:00 - 17:20

Futoshi Minato (JAEA, Tokai, Japan): Study of particle emissions following β -decays and muon captures (*remote*)

17:25 - 17:45

Vandana Tripathi (Florida State University, USA): Beta decay of very exotic P, S and Cl isotopes near N=28 with T_z from 5.5 to 7 (*remote*)

17:50 - 18:10

Alejandro Algora (IFIC, Valencia, Spain): The ^{186}Hg ground state deformation puzzle

18:15 - 18:35

Filip Kondev (ANL, USA): Decay spectroscopy of neutron-rich nuclei at CARIBU

18:40 - 19:00

Alexandrina Petrovici (IFIN-HH, Bucharest-Magurele, Romania): Triple shape coexistence and β -decay of ^{96}Y to ^{96}Zr

19:05 - 21:00 Welcome cocktail

Tuesday, May 31, 2022

SESSION 5 –The status of E0 transitions

Chair: **Tibor Kibedi** (Australian National University, Australia)

9:00 - 9:20

Tibor Kibedi (Australian National University, Australia): Electric monopole transitions in nuclei

9:25 - 9:45

Adam Garnsworthy (TRIUMF, Canada): Studies of E0 transition strengths at TRIUMF-ISAC
(remote)

9:50 - 10:10

Katarzyna Wrzosek-Lipska (Heavy Ion Laboratory, Warsaw, Poland): Shape coexistence and E0 transitions in neutron-deficient Hg isotopes studied through Coulomb excitation

10:15 - 10:35

Martin Venhart (Institute of Physics, Bratislava, Slovakia): Nuclear structure and possible E0 transitions in ^{179}Au

10:40 - 11:00

Eiji Ideguchi (RCNP Osaka University, Japan): Electric monopole transition from the super-deformed band in ^{40}Ca (remote)

11:05 - 11:20 Coffee break

SESSION 6 – Coupling of quasiparticles with collective triaxial degrees of freedom

Chair: **Stefan Frauendorf** (University Notre Dame, USA) (remote)

11:20 - 11:40

Stefan Frauendorf (University Notre Dame, USA): Topological classification of particle-triaxial-rotor systems (remote)

11:45 - 12:05

Elena Lawrie (iThemba LABS, South Africa): Nature of the excited bands in odd-mass triaxial nuclei within the quasiparticle-plus-triaxial rotor model

12:10 - 12:30

Javid Sheikh (University of Kashmir, India): Triaxial deformation in atomic nuclei (remote)

12:35 - 12:55

Kosuke Nomura (University of Zagreb, Croatia): Mean-field derivation of the interacting boson model for transitional nuclei (remote)

13:00 - 13:10

Qibo Chen (East China Normal University, Shanghai, China): Wobbling motion in even-even nuclei (remote)

13:15 - 14:30 Lunch

SESSION 7 – Wobbling and chirality in nuclei

Chair: **Costel Petrache** (University Paris-Saclay and IJCLab, Orsay, France)

14:40 - 15:00

Radu Budaca (IFIN-HH, Bucharest-Magurele, Romania): Harmonic and anharmonic wobbling excitations from a semiclassical treatment of rigid quasiparticle alignments

15:05 - 15:25

Pengwei Zhao (Peking University, China): How do triaxial nuclei rotate chirally? ([remote](#))

15:30 - 15:50

Nirupama Sensharma (University of North Carolina, USA): Chirality and wobbling in ^{135}Pr ([remote](#))

15:55 - 16:15

Song Guo (IMP Lanzhou, China): The experimental evidence questioning the validity of wobbling interpretation at low spin ([remote](#))

16:20 - 16:30

Bingfeng Lv (IMP Lanzhou, China): Re-investigation of the low-lying structure of ^{135}Pr ([remote](#))

16:35 - 16:55 Coffee break

SESSION 8 – Nuclear charge radii, staggering and shell effects, neutron skin

Chair: **Anatoli Afanasjev** (Mississippi State University, USA) ([remote](#))

16:55 - 17:15

Anatoli Afanasjev (Mississippi State University, USA): Charge radii in covariant density functional theory: general situation, odd-even staggering and connection to atomic physics ([remote](#))

17:20 - 17:40

Robert Michaels (Jefferson LAB, USA): Neutron Skins of ^{48}Ca and ^{208}Pb from Parity-Violating Scattering at JLab

17:45 - 18:05

James Cubiss (University of York, UK): Jumps and bumps in charge radii around $Z=82$

18:10 - 18:30

Paul-Gerhard Reinhard (Friedrich-Alexander-University, Erlangen, Germany): Charge radii in nuclear DFT: developments and predictions ([remote](#))

18:35 - 18:45

Agota Koszorus (CERN, Suisse): Exploring the sensitivity of nuclear charge radii to structural changes in the Ca region ([remote](#))

18:50 - 21:00 Poster session - cocktail

Wednesday, June 1, 2022

SESSION 9 – Selected methods for the study of exotic phenomena in nuclei

Chair: **Patrick Regan** (University of Surrey, UK)

09:00 - 09:20

Corina Andreoiu (Simon Fraser University, Burnaby, Canada): Searching for Pygmy quadrupole resonance states in ^{118}Sn using neutron capture at the Institute Laue-Langevin

09:25 - 09:45

Mathieu Lebois (University Paris-Saclay and IJCLab, Orsay, France): Beta-decay studies at ALTO

09:50 - 10:10

Tuomas Grahn (Jyväskylä University, Finland): Lifetime measurements of neutron-deficient odd-A W and Os nuclei

10:15 - 10:35

Nico Orce (University of Western Cape, South Africa): Universality of abundances in r-process nucleosynthesis (**remote**)

10:40 - 10:50

Wen Hui Long (Lanzhou University, China): Underlying mechanism responsible for even-parity ground state and one-neutron halo of ^{11}Be (**remote**)

10:55 - 11:20 Coffee break

SESSION 10 – Shapes and shape coexistence

Chair: **Elena Litvinova** (Western Michigan University, Kalamazoo, USA)

11:20 - 11:40

Bonneau Ludovic (University of Bordeaux, France): Two-quasiparticle states in some odd-odd heavy deformed nuclei within a microscopic approach

11:45 - 12:05

Garcia-Ramos Jose-Enrique (University of Huelva, Spain): Quantum Simulation of the Agassi Model Trapped Ions

12:10 - 12:25

Bhoomika Maheshwari (University of Zagreb, Croatia): Generalised seniority for isomers and low-lying excitations in nuclei

12:30 - 12:50

Zhipan Li (Southwest University, Chongqing, China): Study of nuclear low-lying spectrum and shape phase transition within microscopic triaxial-and-pairing collective Hamiltonian (**remote**)

12:55 - 13:10

Nikolay Minkov (INRNE, Sofia, Bulgaria): Effects of the shape on the formation and decay properties of the ^{229m}Th isomer (**remote**)

13:15 - 14:30 Lunch

SESSION 11 –Results from DESPEC, CARIBU and JYFL

Chair: **Filip Kondev** (ANL, USA)

14:40 - 15:00

Jurgen Gerl (GSI Darmstadt, Germany): Recent results and perspectives of DESPEC

15:05 - 15:25

Patrick Regan (University of Surrey, UK): Commissioning the fast timing array (FATIMA) at FAIR-0: Lifetimes of excited states in the N=50 isotones ^{96}Pd and ^{94}Ru

15:30 - 15:50

Michel Allmond (ORNL, USA): Search for triaxial deformation using Coulomb excitation and β -decay ([remote](#))

15:55 - 16:15

Janne Pakarinen (Jyväskylä University, Finland): Simultaneous in-beam gamma-ray and electron spectroscopy at JYFL ([remote](#))

16:20 - 16:40 Coffee break

SESSION 12 – Shapes and symmetries

Chair: **Jerzy Dudek** (IPHC, Strasbourg, France)

16:40 - 17:00

Katarzyna Hadyńska-Kleńk (Heavy Ion Laboratory, Warsaw, Poland): Shapes in the stable Xe isotopic chain

17:05 - 17:25

Irene Dedes (IFJ PAN, Krakow, Poland): Experimental identification criteria of exotic shapes and symmetries around octupole magic number N=136

17:30 - 17:50

Rami Gaamouci (USTHB, Alger, Algeria): Exotic shapes and shape coexistence in light atomic nuclei: From super-oblate to toroidal structures) ([remote](#))

17:55 - 18:15

Dennis Bonatsos (INPP Demokritos, Athens, Greece): Islands of shape coexistence in covariant density functional theory ([remote](#))

18:20 - 18:40

Adriana Martinou (INPP Demokritos, Athens, Greece): The island of shape coexistence within the shell model SU(3) symmetry ([remote](#))

18:45 - 19:00

Amiram Leviatan (Racah Institute of Physics The Hebrew University, Jerusalem, Israel): From energy density functionals to partial dynamical symmetries in nuclei ([remote](#))

Thursday, June 2, 2022

SESSION 13 – Ab initio methods

Chair: **Petr Navratil** (TRIUMF, Canada)

09:00 - 09:20

Petr Navratil (TRIUMF, Canada): Ab initio investigations of $A=8$ nuclei: Alpha-clustering, deformation in ${}^8\text{He}$, $p+{}^7\text{Li}$ radiative capture and the X17 boson

09:25 - 09:45

Takayuki Miyagi (Technical University, Darmstadt, Germany): Ab initio calculations for heavy-mass nuclei

09:50 - 10:10

Alexander Tichai (Technical University, Darmstadt, Germany): Recent advances in the in-medium similarity renormalisation group

10:15 - 10:35

Wataru Horiuchi (Hokkaido University, Japan): Nuclear shapes and density profiles of exotic nuclei (remote)

10:40 - 11:00 Coffee break

SESSION 14 – Nuclear structure with density functional and shell-model approaches

Chair: **Gianluca Colò** (University of Milan, Italy)

11:00 - 11:20

Gianluca Colò (University of Milan, Italy): Different avenues for improving current Energy Density Functionals: The inverse Kohn-Sham problem

11:25 - 11:45

Jacek Dobaczewski (University of York, UK): Electromagnetic moments in nuclei within nuclear DFT (remote)

11:50 - 12:10

Francesco Marino (University of Milan, Italy): Energy functionals grounded in ab initio calculations: a systematic ladder of approximations

12:15 - 12:35

Tomoya Naito (RIKEN, Tokyo, Japan): Can we improve energy density functionals? A perturbative method (remote)

12:40 - 13:00

Takaharu Otsuka (University of Tokyo, Japan): Prevailing triaxiality of heavy deformed nuclei (remote)

13:15 - 14:30 Lunch

15:00 - 16:00 **Transfer Orsay - Paris**

17:30 - 19:00 **Paris: Visit Musée d'Orsay**

19:00 - 21:30 **Paris: Social dinner Musée d'Orsay**

22:30 - Returning to Orsay

Friday, June 3, 2022

SESSION 15 – Isomers

Chair: **Phil Walker** (University of Surrey, UK) ([remote](#))

9:00 - 09:20

Zsolt Podolyak (University of Surrey, UK): Isomeric states around ^{208}Pb

09:25 - 09:45

Juha Uusitalo (Jyväskylä University, Finland): Recent isomer studies using the MARA recoil separator at JYFL-ACCLAB

09:50 - 10:10

Ashok Kumar Jain (IIT Roorkee, India): The 0^+ isomers and shape coexistence ([remote](#))

10:15 - 10:35

Changbo Fu (Fudan University, Shanghai, China): ^{83}Kr isomers induced by femtosecond lasers ([remote](#))

10:40 - 10:55

Song Guo (IMP Lanzhou, China): Probing ^{93m}Mo isomer depletion with an isomer beam in HIRFL ([remote](#))

11:00 - 11:20 Coffee break

SESSION 16 – Alpha clustering, magnetic moments, structure of superheavy nuclei

Chair: **Alexandrina Petrovici** (IFIN-HH, Bucharest-Magurele, Romania)

11:20 - 11:40

Sophie Peru (CEA, Bruyère le Châtel, France): Description of magnetic moments within Gogny HFB

11:45 - 12:05

Krzysztof Pomorski (Maria Curie-Skłodowska University, Lublin, Poland): On the stability of superheavy nuclei

12:10 - 12:30

Takashi Nakatsukasa (Tsukuba University, Japan): Alpha-particle distribution in nuclei ([remote](#))

12:35 - 12:55

Xiao-Tao He (Nanjing University of Aeronautics and Astronautics, Nanjing, China): Structure study of light superheavy nuclei ([remote](#))

13:00 - 14:30 Lunch

SESSION 17 – Relativistic mean field and shell model calculations, clusters in nucleiChair: **Ashok Kumar Jain** (IIT Roorkee, India) ([remote](#))

14:40 - 15:00

Elena Litvinova (Western Michigan University, Kalamazoo, USA): Reconciling superfluidity and deformation in the relativistic nuclear field theory

15:05 - 15:25

Giovanni De Gregorio (University della Campania, Napoli, Italy): Shell model calculations of the neutrino-less double beta decay matrix elements

15:30 - 15:50

Joseph Cseh (Institute of Nuclear Research, Debrecen, Hungary): A symmetry in-between the shapes, shells and clusters of nuclei ([remote](#))**15:55 - 16:10 Coffee break****SESSION 18 – Shapes, cranking models and best posters presentations**Chair: **Andreoiu Corina** (Simon Fraser University, Burnaby, Canada)

16:10 - 16:30

Jie Meng (Peking University, China): Novel shapes for exotic nuclei ([remote](#))

16:35 - 16:55

Zhenhua Zhang (North China Electric Power University, China): Rotational excitations in rare-earth nuclei: a comparative study within different cranking models ([remote](#))

17:00 - 17: 10

Presentation poster experiment

17:15 - 17: 25

Presentation poster theory

17:30 - 17:40

Closing remarks

POSTER SESSION - Tuesday, May 31, 2022, 18:35 - 20:30

Theory

1. **Batail Lyssandra** (Université Libre de Bruxelles, Belgium): A Giant Resonance tale: there and back again between experimental and theoretical results
2. **Grams Guilherme** (Université Libre de Bruxelles, Belgium): Brussels Skyrme mass models: from triaxial nuclei to neutron stars
3. **Maya Berbecho Esperanza** (University of Huelva, Spain): Shape coexistence in strontium isotopes
4. **Jalili Majarshin Amir** (Nankai University, China): Properties of giant dipole resonances within an extended spd-IBM model
5. **Morley Peter** (Blue Ridge Scientific LLC, USA): The Atomic Nucleus is a Protein-folding Problem
6. **Wakudyanaye Ignasio** (iThemba LABS, South Africa): Tilted precession. bands in 133 and ^{131}Ba

Experiment

1. **Basak Shefali** (VECC, Kolkata, India): Shape coexistence in Sm nuclei around $N=90$
2. **Birova Monica** (Institute of Physics, Bratislava, Slovakia): High-precision study of excited states of $^{182,183}\text{Au}$ at ISOLDE
3. **Dar Shabir Ahmad** (VECC, Kolkata, India): Band structures in $^{115,116}\text{Sb}$
4. **Das Pragya** (IIT Bombay, Bombay, India): Triaxial nuclear shapes in odd-odd nuclei ^{126}I and ^{130}Cs
5. **Franchoo Serge** (IJCLab, Orsay, France): Cross sections of neutron-rich isotopes near $N=50$ in knock-out reactions
6. **Grosse Eckart** (Technical University of Darmstadt, Germany): A large number of observations indicate broken axial symmetry as essential feature for the ground states of heavy nuclei
7. **Jodidar Praveen** (University Paris-Saclay and IJCLab, Orsay, France): Study of collectivity and shape coexistence in lanthanides close to proton drip-line
8. **Kaci Massyl** (University Paris-Saclay and IJCLab, Orsay, France): In beam γ -ray spectroscopy of the exotic ^{79}Cu with germanium detectors
9. **Lv Bingfeng** (IMP Lanzhou, China): Experimental evidence of transverse wobbling bands in ^{136}Nd
10. **Mthembu Sinegugu** (iThemba LABS, South Africa): Search for wobbling bands in ^{193}Au
11. **Nerlo-Pomorska Bożena** (Maria Curie-Skłodowska University, Lublin, Poland): Shape isomers in Pt, Hg and Pb isotopes with $N < 126$
12. **Polettini Marta** (University of Milan, Italy): Search for octupole deformation in $A \sim 225$ Po-Fr nuclei
13. **Rey-herme Emmanuel** (CEA Saclay, France): Decay spectroscopy of ^{225}Pa : Toward laser spectroscopy of neutron-deficient actinides
14. **Si Min** (IJCLab, France): Beta-decay spectroscopy of exotic nuclei around ^{132}Sn
15. **Spacek Andrej** (Institute of Physics, Bratislava, Slovakia): A new α -decay branch in ^{179}Hg

16. **Vasileiou Polytimos** (National and Kapodistrian University of Athens, Greece): Nuclear structure investigations of even-even Hf isotopes
17. **Zheng Kuankuan** (IMP Lanzhou, China) : Evidence for oblate-prolate shape coexistence in the strongly deformed nucleus ^{119}Cs
18. **Zheng Kuankuan** (IMP Lanzhou, China): Candidate revolving chiral doublet bands in ^{119}Cs
19. **Zimba George** (Jyväskylä University, Finland): Low-spin structure in $T_z = 0$, ^{70}Br and $T_z = -1$, ^{70}Kr