

**Zakopane Conference on Nuclear Physics**  
**August 27 – September 2, 2012**

**Program of the Conference**  
(status as of August 27, 2012)

**Monday, August 27**

15:00 – 17:00 Arrival of the Conference participants

18:00 Dinner

19:30 – 20:30 Opening session

**19:30 Opening of the Conference**

19:45 Baha Balantekin (University of Wisconsin-Madison)  
*An outlook on nuclear physics*

20:30 Welcome reception

## Tuesday, August 28

7:30 – 8:30 Breakfast

8:30 – 12:50 Morning Session

### Frontiers of nuclear theory

Witold Nazarewicz, convener

8:30 Joseph Carlson (Los Alamos National Laboratory)

*Neutron matter from low to high densities*

9:00 Heiko Hergert (Ohio State University)

*In-medium similarity renormalization group for finite nuclei*

9:15 Thomas Papenbrock (University of Tennessee and ORNL)

*Toward model-independent nuclear structure computations*

9:45 Jacek Dobaczewski (University of Warsaw)

*Effective theory for low-energy nuclear energy density functionals*

10:15 Jun Terasaki (University of Tsukuba)

*Overlap of QRPA states based on ground states of different nuclei*

10:30 Coffee break

11:00 Nicolas Schunck (Lawrence Livermore National Laboratory)

*Microscopic description of nuclear fission*

11:25 Furong Xu (Peking University)

*Recent studies on nuclear shapes of ultrahigh-spin and high-K states*

11:50 Charles Horowitz (Indiana University)

*Nuclear structure, neutron stars, and gravitational waves*

12:20 Andrzej Baran (Maria Curie Skłodowska University)

*Stability of superheavy elements in Skyrme HFB approach*

12:35 Wojciech Brodziński (NCBJ Świerk)

*Prospects for superheavy nuclei with  $Z \geq 128$*

13:00 Lunch

14:00 – 17:30 Afternoon Session

**Exotic geometrical symmetries in nuclei: Selected new results**  
**Naftali Auerbach, chairman**

- 14:00 Jerzy Dudek (University of Strasbourg and IPHC)  
*Symmetries predicted by theory <-> Predictive power of theories*
- 14:30 Lee Riedinger (University of Tennessee)  
*Search for new symmetries in fast-rotating nuclei*
- 14:55 Michael Jentschel (ILL Grenoble)  
*Ultra-high resolution gamma-ray spectroscopy search for symmetries*
- 15:20 Toshiyuki Sumikama (Tohoku University)  
*Decay spectroscopy of neutron-rich nuclei in the vicinity of  $^{110}\text{Zr}$  at RIBF*
- 15:45 Hervé Molique (IPHC and University of Strasbourg)  
*Nuclear Mean Field techniques and the stability of theoretical predictions*

16:00 Coffee break

- 16:20 Artur Dobrowolski (Maria Curie Skłodowska University)  
*Electric transitions in hypothetical Tetrahedral and Octahedral bands*
- 16:35 David Rouvel (University of Strasbourg)  
*Superposition of two very distinct symmetries in one quantum state of an atomic nucleus*
- 16:50 Obed Shirinda (iThemba LABS)  
*Studying chiral bands associated with multi-quasiparticle configuration*
- 17:05 Hideyuki Sakai (RIKEN Nishina Center)  
*"Einstein was wrong?" – The EPR paradox and a test of Bell inequality by proton pairs*

14:00 – 18:00 Excursion for accompanying persons

18:00 Dinner

19:00 – 19:40 Evening Session

**Few-nucleon interaction dynamics**  
**Reinhard Kulesa, chairman**

- 19:00 Stanisław Kistryn (Jagiellonian University)  
*Studies of few-nucleon interaction dynamics in new generation experiments*
- 19:25 Barbara Kłos (University of Silesia)  
*Systematic studies of the three-nucleon system dynamics in the deuteron-proton breakup reaction*

**Poster session**

**Witold Męczyński, chairman**

**List of posters:**

Theory / Experiment / Instrumentation

- T-1 Andreea-Ioana Budaca (NIPNE Bucharest)  
*Alpha decay properties of the shell stabilized superheavy nuclei*
- T-2 M. El-Azab Farid (Assiut University, Egypt)  
*Theoretical investigations of  ${}^6,8\text{He}$  halo nuclei using Microscopic Optical Potentials*
- T-3 Diego Gruyer (GANIL)  
*Pseudo-Critical behavior of nuclear multifragmentation*
- T-4 Mahmoud Hassanain (King Khalid University, Saudi Arabia)  
*An investigation of  ${}^{16}\text{O} + {}^{16}\text{O}$  elastic scattering by using Cluster Folding Model at high energies*
- T-5 Mahmoud Hassanain (King Khalid University, Saudi Arabia)  
*Elastic scattering analysis of heavy ion at low energy*
- T-6 Awad Ibraheem (King Khalid University, Saudi Arabia)  
*Theoretical analysis of Alpha-Nucleus scattering using folded potentials*
- T-7 Katarzyna Mazurek (IFJ PAN Kraków)  
*Fission dynamics as a probe of the shape-dependent congruence energy term in the macroscopic models*
- T-8 Bożena Nerlo-Pomorska and Krzysztof Pomorski (Maria Curie Skłodowska University)  
*Rotational bands and masses of heaviest nuclei*
- T-9 Monika Pieńkos (University of Silesia)  
*Symmetry energy and structure of a neutron star*
- E-1 Harith Al-Azri (University of York)  
*Lifetime measurements of excited states in proton rich 108,109Te isotopes*
- E-2 Thamer Alharbi (University of Surrey)  
*Lifetime Measurements of the first excited  $6^+$  states in  $N=80$  isotones,  ${}^{138}\text{Ce}$  and  ${}^{140}\text{Nd}$*
- E-3 Józef Andrzejewski (University of Łódź)  
*The study of K-isomer in  ${}^{134}\text{Nd}$  by using electron conversion spectroscopy*
- E-4 Aleksandra Fijałkowska (University of Warsaw and ORNL)  
*New approach to the decay heat calculations based on the Monte Carlo methods*

- E-5 Giulia Guastalla (Technical University Darmstadt)  
*Analysis of the  $^{104}\text{Sn}$  experiment at PreSPEC*
- E-7 Rafał Najman (Jagiellonian University)  
*Characteristics of the fragment production in  $^{197}\text{Au} + ^{197}\text{Au}$  reaction at 23 AMeV*
- I-1 Dmitry Gorelov (University of Jyväskylä)  
*A neutron source for new IGISOL facility*
- I-2 Mateusz Kaczmarek (University of Szczecin)  
*New accelerator facility for measurements of nuclear reactions at extremely low energies*
- I-3 Mateusz Krzysiek (IFJ PAN Kraków)  
*Geant4 and GEMINI++ based simulations of possible application of the Recoil Filter Detector in nuclear structure studies with stable and radioactive beams*
- I-4 Lianne Scruton (University of York)  
*Recent results from fast timing polycrystalline diamond detectors as part of the LYCCA-0 array*
- I-5 László Stuhl (ATOMKI Debrecen)  
*The application of the Low Energy Neutron Array (LENA)*
- I-6 Christine Weber (Ludwig-Maximilians-University Munich)  
*Towards in-trap observation of nuclear decays*
- I-7 Mirosław Ziębliński (IFJ PAN Kraków)  
*Testing of the PARIS  $\text{LaBr}_3\text{-NaI}$  phoswich detectors with high-energy gamma-rays*
- I-8 Vandana Nanal (Tata Institute, Mumbai)  
*Characterisation of a  $\text{LaBr}_3\text{-NaI(Tl)}$  Phoswich detector (PARIS) for high energy gamma rays*

## Wednesday, August 29

7:30 – 8:30 Breakfast

8:30 – 12:55 Morning Session

### Evolution of the nuclear structure in neutron-rich and heavy nuclei

Robert Janssens, convener

8:30 Guy Savard (University of Chicago and ANL)

*Mass measurements of neutron-rich nuclei with CARIBU*

8:55 Gerda Neyens (KU Leuven)

*Measurements of nuclear moments, spins and charge radii in neutron-rich nuclei: probing structural changes*

9:20 Pieter Doornenbal (RIKEN Nishina Center)

*Search for the southern and eastern boundaries of the Island of Inversion*

9:35 Benjamin Kay (University of York)

*Transfer reactions and the structure of neutron-rich nuclei*

10:00 Augusto Macchiavelli (Lawrence Berkeley National Laboratory)

*Selected aspects of the structure of exotic nuclei and new opportunities with GRETINA*

10:30 Coffee break

11:00 Christopher Chiara (University of Maryland and ANL)

*Search for intruder states in  $^{68}\text{Ni}$  and  $^{66,67}\text{Co}$*

11:15 Igor Celikovic (GANIL)

*Lifetime measurements of Zn isotopes around  $N=40$*

11:30 Agnieszka Korgul (University of Warsaw)

*Beta-decay properties of  $^{85,86}\text{Ge}$  and  $^{86,87}\text{As}$*

11:45 George Dracoulis (Australian National University)

*Deep-inelastic reactions and K-isomers in neutron-rich nuclei crossing the perimeter of the  $A=180-190$  deformed region*

12:10 Emma Wilson (University of Surrey)

*Core excitations across the neutron shell gap in the  $Z=81$   $^{207}\text{Tl}$  nucleus*

12:25 Stanislav Antalic (Comenius University Bratislava)

*Nuclear structure studies of heaviest elements measured at SHIP*

12:40 Peter Thirolf (Ludwig-Maximilians-University Munich)

*Bridging the gap between atomic and nuclear physics: Towards an all-optical access to the lowest nuclear transition in  $^{229\text{m}}\text{Th}$*

13:00 Lunch

14:00 – 18:00 Excursion to the Tatra Mountains

18:00 Dinner

19:00 – 22:30 Evening session

### **Nuclear reactions around the Coulomb barrier**

**Lorenzo Corradi, convener**

19:00 Giovanni Pollarolo (University of Torino and INFN)  
*Aspects of transfer reactions in light and heavy ion collisions*

19:30 Suzana Szilner (Ruder Boskovic Institute Zagreb)  
*Transfer reaction studies with spectrometers*

19:50 Felix Liang (Oak Ridge National Laboratory)  
*Recent results of fusion induced by neutron-rich radioactive beams studied at HRIBF*

20:10 Maurits Evers (Australian National University)  
*Near-barrier nuclear collisions: From coherent quantum-superposition to dissipative dynamics*

20:30 **Short break**

20:45 Marco Mazzocco (University of Padova)  
*Recent results on reactions with weakly bound nuclei*

21:05 Wolfram von Oertzen (Helmholz Zentrum Berlin)  
*True ternary fission: a new type of radioactive decay of  $^{252}\text{Cf}$*

21:30 Simone Bottoni (University of Milano and INFN)  
*Reaction dynamics and nuclear structure of moderately neutron-rich Ne isotopes by heavy ion reactions*

21:45 Valentina Scuderi (INFN Laboratori Nazionali del Sud)  
*Elastic scattering and direct reactions for the  $^{11}\text{Be}+^{64}\text{Zn}$  system close to the Coulomb barrier*

22:00 Gloria Marquínez Durán (University of Huelva)  
*Preliminary results on the scattering of  $^8\text{He}$  with heavy targets*

22:15 Roman Kuzyakin (JINR Dubna)  
*Isotopic trends of capture cross section and mean-square angular momentum of captured system*

## Thursday, August 30

7:30 – 8:30 Breakfast

8:30 – 12:45 Morning Session

### Nuclear structure near the proton drip line

Robert Wadsworth, convener

8:30 Jonathan Billowes (University of Manchester)

*Determination of charge radii of  $^{74}\text{Rb}$  and other proton-rich nuclei*

9:00 Michael Bentley (University of York)

*Study of isospin-symmetry breaking in the  $f_{7/2}$  shell using knockout reactions*

9:30 Torbjörn Bäck (Royal Institute of Technology (KTH))

*Study of collectivity in neutron-deficient  $\text{Te}$  and  $\text{Sn}$  isotopes*

10:00 Yasuhiro Togano (EMMI GSI Darmstadt)

*Hindered proton collectivity in the proton-rich nucleus  $^{28}\text{S}$ : Possible new magic number at  $Z=16$*

10:15 Nadya Smirnova (CENBG Bordeaux-Gradignan)

*Isospin symmetry breaking in  $sd$  shell nuclei and applications*

10:30 Coffee break

11:00 Alexandre Obertelli (CEA Saclay)

*Relativistic Coulomb measurements in the mass 66 region and the first spectroscopy results on  $^{66}\text{Se} / ^{65}\text{As}$*

11:25 Krzysztof Miernik (ORNL and University of Warsaw)

*Latest results from two proton decay studies*

11:50 Marcin Palacz (Heavy Ion Laboratory, University of Warsaw)

*Odd parity core excitation of the  $N=Z=50$  core*

12:15 Magdalena Matejska-Minda (IFJ PAN Kraków)

*Lifetime measurement of high-lying short lived states in  $^{69}\text{As}$*

12:30 Valentina Liberati (University of the West of Scotland)

*Beta-delayed fission and alpha-decay spectroscopy of the lightest  $\text{Tl}$  isotopes*

13:00 Lunch

14:00 – 17:50 Afternoon session

**Modern approach to shell-model and beyond**  
**Morten Hjorth-Jensen, convener**

- 14:00 Takaharu Otsuka (University of Tokyo)  
*Nuclear structure toward the driplines; understanding many-body forces and correlations*
- 14:30 Christian Forssén (Chalmers University of Technology)  
*Light nuclei in the ab initio no-core shell model*
- 15:00 Olivier Sorlin (GANIL)  
*Modifications of shell closures far from stability: evidences, causes and consequences*
- 15:25 Alexandre Lepailleur (GANIL)  
*Study of nuclear interactions for the weakly bound nucleus of  $^{26}\text{F}$*
- 15:40 Frederic Nowacki (IPHC Strasbourg)  
*The island of inversion around  $A=64$*

16:00 Coffee break

- 16:20 Mohamad Moukaddam (IPHC Strasbourg)  
*Evolution of the shell structure in medium-mass nuclei: Search for the  $2d_{5/2}$  neutron orbital in  $^{69}\text{Ni}$*
- 16:35 Maria Doncel (Royal Institute of Technology (KTH))  
*Lifetime measurements in neutron-rich Cu isotopes*
- 16:50 Kamila Sieja (IPHC Strasbourg)  
*Toward a generalized monopole description of atomic nuclei*
- 17:05 Robert Grzywacz (University of Tennessee)  
*Beta-delayed neutron emission from the r-process nuclei*
- 17:30 Piotr Bednarczyk (IFJ PAN Kraków)  
*Experimental studies and shell model description of collective structures in fp nuclei at high spin*

14:00 – 18:00 Excursion for accompanying persons

18:00 Dinner

19:00 – 20:45 Evening session

**Highlights in nuclear astrophysics**

**Michael Hass, convener**

- 19:00 Hendrik Schatz (Michigan State University)  
*Nucleosynthesis of elements*
- 19:30 Marialuisa Aliotta (University of Edinburgh)  
*Explosive scenarios, rp-process, X-ray bursts*
- 19:55 B. S. Nara Singh (University of York)  
*New advances for the  ${}^3\text{He}({}^4\text{He}, \gamma){}^7\text{Be}$  reaction*
- 20:20 Alain Coc (CSNSM Orsay)  
*Big Bang nucleosynthesis*

21:15 Barbecue at Karczma „Biały Potok”

## Friday, August 31

7:30 – 8:30 Breakfast

8:30 – 12:45 Morning Session

### Collective modes in exotic nuclei

Adam Maj, convener

8:30 Peter Ring (Technical University Munich)  
*Theory of Dipole-Resonances in nuclei close and far from stability*

9:00 Angela Bracco (University of Milano and INFN)  
*The gamma decay of high lying states with inelastic scattering of  $^{17}\text{O}$  and with AGATA*

9:30 Atsushi Tamii (Osaka University)  
*Studies of the electric dipole response in nuclei using the scattering of polarized protons*

10:00 Tamás Tornyai (University of Oslo and ATOMKI Debrecen)  
*Study of the  $\gamma$ -ray strength in  $^{238}\text{Np}$*

10:15 Paola Marini (GANIL)  
*Symmetry energy and secondary decay: toward the reconstruction of primary fragments*

10:30 Coffee break

11:00 Henry Weller (Duke University and TUNL)  
*Precise determination of the Isovector Giant Quadrupole Resonance in nuclei*

11:30 Nguyen Dinh Dang (RIKEN Nishina Center)  
*Description of GDR damping in highly excited nuclei*

12:00 Concetta Parascandolo (University of Padova and INFN)  
*Dynamical Dipole mode: a “collective” tool to understand reaction dynamics by using stable and radioactive beams*

12:15 Michał Ciemala (IFJ PAN Kraków)  
*Gamma-decay of the GDR in the GEMINI++ code.*

12:30 Katarzyna Hadyńska-Klęk (University of Warsaw)  
*Study of the  $^{42}\text{Ca}$  nuclear structure using AGATA and EAGLE spectrometers: Recent results from the Coulomb excitation of the  $^{42}\text{Ca}$  experiment*

13:00 Lunch

14:00 – 18:00 Excursion to the Tatra Mountains

18:00 Dinner

19:00 – 22:00 Evening session

**Nuclear spectroscopy with novel techniques**

**Faical Azaiez, convener**

19:00 Ari Jokinen (University of Jyväskylä)  
*Trap-assisted nuclear spectroscopy*

19:25 Kieran Flanagan (University of Manchester)  
*Recent advances of laser spectroscopy at ISOLDE*

19:50 David Verney (IPN Orsay)  
*Modern decay spectroscopy with beta-gamma-neutron detectors at ALTO*

20:15 Karolina Kolos (IPN Orsay)  
*Beta decay spectroscopy near  $^{78}\text{Ni}$ : level structure of  $^{83,84}\text{Ge}$*

20:30 Short break

20:45 Cristina Petrone (NIPNE and University of Bucharest)  
*Gamma spectroscopy of isomeric states in neutron-rich nuclei:  $^{75}\text{Cu}$  and  $^{78}\text{Ga}$*

21:00 Lorant Csige (Ludwig-Maximilians-University Munich)  
*Photofission of  $^{238}\text{U}$  induced by quasi-monochromatic, Compton backscattered gamma beam*

21:15 Anukul Dhal (Weizmann Institute of Science)  
*Probing fundamental interactions by an Electrostatic Ion Beam Trap (EIBT)*

21:30 Dario Nicolosi (INFN LNS and University of Catania)  
*Spectroscopy of  $^{13}\text{B}$  via the ( $^{18}\text{O}$ ,  $^{16}\text{O}$ ) two neutron transfer reaction*

21:45 Jasmeet Kaur (Panjab University, India)  
*Quadrupole moment and g-factor measurements of the isomeric states in  $^{128,129}\text{Ba}$*

## Saturday, September 1

7:30 – 8:30 Breakfast

8:30 – 12:20 Morning Session

### Direct reactions and halo nuclei

Thomas Aumann, convener

8:30 Carlos Bertulani (Texas A&M University-Commerce)  
*BBN and stellar nucleosynthesis from direct reactions*

9:00 Takashi Nakamura (Tokyo Institute of Technology)  
*Coulomb and nuclear breakup of neutron drip line nuclei*

9:30 Michael Thoennessen (Michigan State University)  
*Observation of ground-state two-neutron decay*

10:00 Zsolt Vajta (ATOMKI Debrecen)  
*Study of neutron rich nuclei  $^{18-21}\text{N}$  and  $^{25}\text{F}$*

10:15 Margit Csatlós (ATOMKI Debrecen)  
*A new method for measuring the neutron-skin thickness*

10:30 Coffee break

11:00 Haik Simon (GSI Darmstadt)  
*Halo nuclei: stepping stones across the drip-lines*

11:25 Kathrin Wimmer (Central Michigan University)  
*Knockout reaction studies, structure and correlations*

11:50 Janusz Skalski (NCBJ Warsaw)  
*Puzzle of third minima in actinides*

12:05 Leszek Próchniak (Maria Curie Skłodowska University)  
*Superdeformed oblate superheavy nuclei in the self-consistent approach*

13:00 Lunch

14:15 – 15:30 Afternoon session

**Seminar session**

**Rafał Broda, chairman**

- 14:15 Ann-Cecilie Larsen (University of Oslo)  
*Astrophysical reactions rates and the low-energy enhancement in the  $\gamma$ -ray strength*
- 14:30 Magne Guttormsen (University of Oslo)  
*Observation of large orbital scissors strength in actinides*
- 14:45 Julien Le Bloas (CEA Bruyeres-le-Châtel)  
*Description of light nuclei ( $8 < Z < 20$ ,  $8 < N < 20$ ) with the multiparticle-multihole Gogny energy density functional*
- 15:00 Łukasz Iskra (IFJ PAN Kraków)  
*High seniority excitations in neutron-rich Sn isotopes*
- 15:15 Oliver Roberts (University of Brighton)  
*The search for isomeric states in  $^{133}\text{Cs}$  and  $^{132}\text{Te}$*

15:30 Coffee break

16:00 – 18:00 Special session

**Special session in celebration of the 60th birthday of Marek Jeżabek,  
Director General of IFJ PAN  
Stanisław Jadach, chairman**

- 16:00 Zbigniew Wąs (IFJ PAN Kraków)  
*The Higgs boson of Standard Model – its function and signatures*
- 16:30 Tadeusz Lesiak (IFJ PAN Kraków)  
*Heavy flavour physics*
- 17:00 Jan Kisiel (University of Silesia)  
*Ideas in neutrino physics*
- 17:30 Mieczysław Witold Krasny (LPNHE Paris)  
*High intensity gamma beams at the LHC*

**Closing talk**

- 18:00 Sydney Gales (IPN Orsay)  
*Summary and outlook: The next 20 years of nuclear physics*

20:15 Conference Banquet

## Sunday, September 2

7:30 – 9:30 Breakfast

9:00 – 10:30 Departure of the Conference participants

### Associated events

Two associated meetings will take place in Kraków before and after the Conference:

Mini-workshop "**Predictive capabilities of nuclear theories**" will be organized by Witold Nazarewicz and Adam Maj on **August 25, 2012** at IFJ PAN Kraków (contact: [adam.maj@ifj.edu.pl](mailto:adam.maj@ifj.edu.pl)).

See [https://dl.dropbox.com/u/3523024/pre\\_Zakopane\\_WS.htm](https://dl.dropbox.com/u/3523024/pre_Zakopane_WS.htm) for details.

Mini-workshop "**Physics with the new 230 MeV proton cyclotron in Kraków**" will be organized by Adam Kozela, Maria Kmiecik, Witold Meczynski and Adam Maj on **September 3, 2012** at IFJ PAN Kraków (contact: [maria.kmiecik@ifj.edu.pl](mailto:maria.kmiecik@ifj.edu.pl)).

See <http://experimentscb.ifj.edu.pl/?static=11> for details.