Zakopane Conference on Nuclear Physics

„Extremes of the Nuclear Landscape"

August 28 – September 4, 2016, Zakopane, Poland

http://zakopane2016.ifj.edu.pl

Scientific Program

Sunday, August 28

Welcome and Opening Talks

19:00 – 21:00

Marek Jeżabek, IFJ PAN Kraków
Welcome Address

Achim Schwenk, TU Darmstadt (40 min)
"Challenges in Nuclear Structure Theory"

Angela Bracco, INFN and University of Milan (40 min)
"Experimental Nuclear Studies - Today and tomorrow"

Monday, August 29

"Nuclear Density Functional Theory and ab-initio calculations"

Convener Jacek Dobaczewski, University of York / University of Warsaw

8:30 – 10:30

Carlo Barbieri, University of Surrey (30 min)
"Advances in self-consistent Green's function calculations of medium mass isotopes"

Luis Robledo, UAM Madrid (25 min)
"Octupole correlations in a full symmetry-conserving framework"

Karim Bennaceur, IPN Lyon (25 min)
"Mean Field description of open shell nuclei using a regularized pseudopotential"

Wojciech Satuła, University of Warsaw (25 min)
"Nuclear structure and beta decays in Extended Density Functional Theory"

Paweł Bączyk, University of Warsaw (15 min)
"Mirror and triplet energy differences within density functional theory"

11:00 – 13:00

Jacek Majewski, University of Warsaw (30 min)
"Recent achievements of Density Functional Theory in electronic systems"

Michael Bender, IPN Lyon (25 min)
"Multi-reference energy density functional calculations for nuclear spectroscopy – perspectives and prospects"

Thomas Duguet, CEA Saclay / KU Leuven / NSCL MSU (25 min)
"Proposal for an ab initio-driven nuclear EDF method"

Dany Davesne, IPN Lyon (25 min)
"Infinite matter properties and zero-range limit of non-relativistic finite-range interactions"

Bartłomiej Szpak, IFJ PAN Kraków (15 min)
"Calibration of novel Energy Density Functionals"

Monday, August 29

„Parallel session – Nuclear Structure Theory”

Chairman Krzysztof Rusek, HIL University of Warsaw

19:00 – 21:00

Gianluca Salvioni, University of Jyväskylä (15 min)
"Model energy functionals derived by ab-initio methods"

Andrea Idini, University of Surrey (15 min)
"Optical potentials and nucleon scattering on medium-mass nuclei from ab-initio Green function"

Andrzej Góźdź, UMCS Lublin (15 min)
"GCM+GOA electromagnetic multipole transition operators and symmetries of generating functions"

Pedro Sarriguren, IEM-CSIC Madrid (15 min)
"QRPA calculations of stellar weak-interaction rates"

Maciej Konieczka, University of Warsaw (15 min)
"DFT-rooted calculations of Gamow-Teller beta decay"

Janina Grineviciute, Warsaw University of Technology (15 min)
"Selected aspects of induced nuclear fission within superfluid extension of TDDFT"

Samuel A. Giuliani, TU Darmstadt (15 min)
"r-process calculations with a microscopic description of the fission process"

Piotr Jachimowicz, University of Zielona Góra (15 min)
"Role of the mass asymmetry, triaxiality and pairing on the fission barrier heights in the even and odd superheavy nuclei"

Monday, August 29

„Parallel session – Nuclear Structure Experiment"

Chair Silvia Leoni, INFN and University of Milan

19:00 – 21:00

Mathieu Babo, GANIL (15 min)
"Beta-delayed charged particle decays of neutron-deficient nuclei ^{22,23}Si"

Alberto Boso, INFN and University of Padova (15 min)
"Isospin symmetry breaking in mirror nuclei ^{23}Mg-^{23}Na"

Vedrana Tokić, RBI Zagreb (15 min)
"Structure of ^{24}Mg excited states and their influence on nucleosynthesis"

Marco Siciliano, INFN Legnaro (15 min)
"Study of quadrupole correlations in N=Z=50 region via lifetimes measurements"

Sanjay Kumar Chamoli, University of Delhi (15 min)
"Investigating prolate-oblate shape inversion in Pt nuclei near A ~ 188"

Elena A. Lawrie, iThemba Labs (15 min)
"Chiral symmetry studies in ^{194}Tl"

Hussam Badran, University of Jyväskylä (15 min)
"Decay spectroscopy of very neutron-deficient lead isotopes"

Matthias Rudigier, University of Surrey (15 min)
"Fast-timing measurement using a $LaBr_3$(Ce) scintillator detector array coupled with Gammasphere"

Tuesday, August 30

New Instrumentation and Techniques

Convener Muhsin Harakeh, GANIL / KVI-CART Groningen

8:30 – 10:30

Klaus Blaum, MPI Heidelberg (25 min)
"High-precision nuclear mass measurements and recent trends in Penning-trap mass spectrometry"

Lawrence Cardman, Jefferson Laboratory (25 min)
"New insights into nuclear structure from electron scattering at Jefferson Lab"

Julien Gibelin, LPC Caen (25 min)
"Recent results with the active target MAYA and the future ACTAR TPC"

Nasser Kalantar, KVI Groningen (25 min)
"The use of storage rings and active targets in the study of reactions at low momentum transfers"

Olivier Dorvaux, IPHC Strasbourg (20 min)
"PARIS: A versatile γ-ray detection array for low and high energy γ-rays"

11:00 – 13:00

Hiroyoshi Sakurai, RIKEN Nishina Center (30 min)
"Decay studies of exotic nuclei at RIKEN"

Giacomo Poggi, INFN Florence (20 min)
"FAZIA: A versatile detection system for EoS studies"

Daniel Napoli, INFN Legnaro (20 min)
"New developments in HPGe detectors for high resolution gamma detection"

Kobus Lawrie, iThemba Labs (20 min)
"The iThemba Labs rare ion beam project"

Jonathan Wilson, IPN Orsay (15 min)
"Production and study of exotic neutron-rich nuclei using the Licorne directional neutron source"

Maya Takechi, Niigata University (15 min)
"Development of high resolution TOF detector for RI beams using Cherenkov radiation"

Tuesday, August 30

Superheavy and Exotic Nuclei

Chairman Rafał Broda, IFJ PAN Kraków

15:30 – 17:40

Yuri Oganessian, JINR Dubna (30 min)
"Island of Stability and new superheavy elements"

Francesca Giacoppo, Helmholz Institute Mainz and GSI Darmstadt (15 min)
"Recent upgrades of the SHIPTRAP setup: On the finish line towards direct mass spectrometry of superheavy elements"

Gurgen Adamian, JINR Dubna (25 min)
"Production of superheavies and exotic nuclei"

Nikolai Antonenko, JINR Dubna (25 min)
"Influence of properties of superheavy nuclei on their alpha decays"

Michał Kowal, NCBJ Warsaw (20 min)
"Structural effects: High-K ground and isomeric states – chance to increase the stability of superheavy nuclei"

Michał Warda, UMCS Lublin (15 min)
"Fission barriers in the neutron deficient Hg isotopes"

Tuesday, August 30

Poster session

19:00 – 21:00

Wednesday, August 31

Direct Reactions and Light Nuclei

Convener Thomas Aumann, GSI Darmstadt

8:30 – 10:30

Miguel Marques, LPC Caen (25 min)
"A few steps beyond the neutron dripline"

Alessia Di Pietro, INFN LNS Catania (15 min)
"Study of ^{9}Li-alpha cluster states in ^{13}B using the Resonant Scattering Method"

Masaomi Tanaka, Osaka University (15 min)
"Reaction cross sections for $^{13\text{-}15}$B and one neutron halo in ^{14}B"

Ivano Lombardo, University of Naples Federico II and INFN (15 min)
"Structure of ^{13}C excited states with low energy elastic and inelastic scattering of alpha particles on ^{9}Be"

Hang Du, Osaka University (15 min)
"Nuclear structure of ^{15,16}C via reaction cross section measurements"

Akira Homma, Niigata University (15 min)
"Measurements of reaction cross section for $^{19\text{-}27}$F isotopes"

Indranil Mazumdar, TIFR Mumbai (20 min)
"Light ion induced capture reactions and application to astrophysics"

Wednesday, August 31

Structure of Neutron-rich Nuclei

Convener Robert Janssens, Argonne National Laboratory,
Chairman Bogdan Fornal, IFJ PAN Kraków

11:00 – 13:00

Piet Van Duppen, KU Leuven (25 min)
"From REX-ISOLDE to HIE-ISOLDE: status and future perspectives"

David Steppenbeck, RIKEN Nishina Center (25 min)
"Recent results on very neutron-rich A ~ 50 nuclei from RIBF"

Sean Liddick, Michigan State University (25 min)
"Shape coexistence around ^{68}Ni"

Shaofei Zhu, Argonne National Laboratory (25 min)
"First experiments with re-accelerated neutron-rich beams from CARIBU"

Roger Caballero-Folch, TRIUMF Vancouver (15 min)
"Results of the heaviest single and multiple β-delayed neutron emitters measured so far"

Wednesday, August 31

Decay of Exotic Nuclei

Convener Krzysztof Rykaczewski, Oak Ridge National Laboratory

19:00 – 21:00

Robert Grzywacz, University of Tennessee (25 min)
"Autopsy of Beta decays with VANDLE"

Nicholas Scielzo, Lawrence Livermore National Laboratory (25 min)
"Trap-aided decay studies"

Charles Rasco, ORNL/JINPA (25 min)
"Total Absorption Spectroscopy and its influence on decay heat and predicted reactor antineutrino fluxes"

Paul E. Garrett, University of Guelph (15 min)
"High statistics Beta-decay measurements at TRIUMF-ISAC and the transition from the 8π spectrometer to GRIFFIN"

Luis Sarmiento, Lund University (15 min)
"Proton decay of $^{53m}Co^{M}$ revisited"

Ivan Mukha, GSI Darmstadt (20 min)
"Interplay of prompt two-proton and sequential decay mechanisms in proton-unbound exotic nuclei"

Thursday, September 1

Collective Excitations

Convener Adam Maj, IFJ PAN Kraków

8:30 – 11:00

Enrico Vigezzi, INFN and University of Milan (25 min)
"Coupling of single-particle and collective vibrations"

Atsushi Tamii, University of Osaka (25 min)
"Electric dipole response studied by proton inelastic scattering: symmetry energy and neutron skin thickness"

Andreas Zilges, University of Cologne (25 min)
"Properties of the Pygmy Dipole Resonance"

Franco Camera, INFN and University of Milan (25 min)
"GDR at finite temperature for isospin mixing measurements"

Oliver Wieland, INFN Milan (15 min)
"Investigation of E1 and PDR strength in ^{70}Ni and ^{64,62}Fe around the threshold"

Panagiota Papakonstantinou, Institute for Basic Science, South Korea (15 min)
"From chiral EFT to Giant and Pygmy Resonances via extended RPA"

Krzysztof Pomorski, UMCS Lublin (20 min)
"Jacobi and Poincaré shape transitions in rotating nuclei"

Friday, September 2

Nuclear Fusion for Energy

Convener Angel Ibarra, CIEMAT Madrid

8:30 – 10:30

Steven Cowley, CCFE Culham (30 min)
"The science challenges for fusion energy"

Ronald Wenninger, Eurofusion (30 min)
"Conceptual design development for a Demonstration Fusion Power Reactor"

Juan Knaster, Fusion for Energy (30 min)
"IFMIF: the Neutron Source for the Fusion Program"

Adam Maj, IFJ PAN Kraków (30 min)
"Feasibility of IFMIF-DONES for other science projects"

Friday, September 2

Structure of Superheavy Nuclei

Convener Dirk Rudolph, Lund University

11:00 – 13:00

Nathan Brewer, Oak Ridge National Laboratory (25 min)
"Heavy and superheavy element synthesis at the Dubna Gas Filled Separator"

Gillis Carlsson, Lund University (25 min)
"Dynamic alpha-decay theory with Density Functional Theory"

Daniel Cox, University of Jyväskylä (15 min)
"Recent progress in electron spectroscopy at JYFL and HIE-Isolde"

Mustapha Laatiaoui, GSI Darmstadt / Helmholtz Institute Mainz (25 min)
"Nuclear-structure information obtained from laser-spectroscopy of Nobelium isotopes"

Peter Thirolf, LMU Munich (25 min)
"Direct detection of the ^{229}Th nuclear clock transition"

Friday, September 2

„Parallel session 3 - Neutron-rich nuclei”

Chairman Piotr Bednarczyk, IFJ PAN Kraków

19:00 – 21:00

Xiaofei Yang, KU Leuven (15 min)
"Nuclear spins, moments and charge radii of neutron-rich Zinc isotopes and isomers"

Michał Czerwiński, University of Warsaw (15 min)
"Neutron-Proton multiplets in the nucleus ^{88}Br"

Magdalena Zielińska, CEA Saclay (15 min)
"Shape coexistence in ^{96,98}Sr"

Damian Ralet, CSNSM Orsay (15 min)
"Lifetime measurements in the even-even neutron-rich Molybdenum isotopes with the Prespec-AGATA setup"

Houda Naïdja, IPHC Strasbourg (15 min)
"Spectroscopic properties and collectivity of neutron-rich nuclei beyond ^{132}Sn core"

Giovanni Bocchi, University of Milan (15 min)
"Interplay between particle and core excitation in the one-valence-proton nucleus ^{133}Sb"

Laila A. Gurgi, University of Surrey (15 min)
"Isomeric spectroscopy of neutron-rich terbium isotopes"

Franco Galtarossa, INFN Legnaro and University of Ferrara (15 min)
"Neutron-rich nuclei populated in multinucleon transfer reactions: The ^{197}Au+^{130}Te system"

Friday, September 2

„Parallel session 4 – Collective excitations and light nuclei”

Chairman t.b.a.

19:00 – 21:00

Marcus Scheck, University of the West of Scotland (15 min)
"Beta decay as novel approach to low-energy E1 excitations"

Nikolay Arsenyev, JINR Dubna (15 min)
"Effects of phonon-phonon coupling on properties of Pygmy resonances in neutron-rich Ca isotopes"

Michael Weinert, University of Cologne (15 min)
"Selective excitation of the Pygmy Dipole Resonance in ^{120}Sn via the (d,pγ) reaction"

Deepika Choudhury, ELI-NP Bucharest (15 min)
"Prospectives of photofission studies with brilliant narrow-width gamma-beam at the new ELI-NP facility"

Artur Dobrowolski, UMCS Lublin (15 min)
"Consistent quadrupole-octupole collective approach"

Józef Andrzejewski, University of Łódź (15 min)
"New results of ^{7}Be(n,α) and ^{7}Be(n,p) cross-section measurements at n_TOF facility, CERN"

Daniele Dell'Aquila, University of Naples Federico II and INFN (15 min)
"Experimental studies of the structure of ^{16}C with reactions at intermediate energy"

Saturday, September 3

Astrophysics and the Origin of Elements

Convener Gabriel Martinez-Pinedo, TU Darmstadt

8:30 – 10:30

Tobias Fischer, University of Wrocław (25 min)
"Origin of the heavy elements in the universe – contributions from massive star explosions"

Artemis Spyrou, Michigan State University (25 min)
"Experimental studies for the astrophysical r-process"

Tomislav Marketin, University of Zagreb (25 min)
"Microscopic calculations of beta decay rates for r-process"

Andreas Bauswein, ITS Heidelberg (25 min)
"Neutron star merger simulations"

Hamidreza Moshfegh, University of Tehran (15 min)
"The effect of nuclear interactions on the neutrino emission of murca process in the neutron star matter "

Saturday, September 3

Special Talks and Closing of the Conference

11:00 – 12:30

Zoltan Fodor, Wuppertal University / Eötvös University Budapest (40 min)
"Neutron-proton mass difference - A fundamental quantity calculated"

George Fuller, University of California San Diego (40 min)
"Gravitational wave astronomy and nuclear and neutrino physics"

E-1 **Nurlan Amangeldi, L.N.Gumilev Eurasian National University, Astana**
"Elastic scattering of ^{15}N ions by ^{16}O at the energy 11.56 MeV"

E-2 **Tugba Arici, GSI Darmstadt**
"Shape coexcistence in ^{70}Kr"

E-3 **Izabela Ciepał, IFJ PAN Kraków**
"Probing three- and four-nucleon interactions with deuteron breakup"

E-4 **Natalia Cieplicka-Oryńczak, INFN Milano**
"Study of calcium isotopes via cold neutron capture reactions"

E-5 **Aysegul Ertoprak, Istanbul University**
"Lifetime measurements of high-spin states in the ^{94}Ru nucleus using the doppler shift attenuation method"

E-6 **Pierpaolo Figuera, INFN LNS Catania** – presented by A. Di Pietro
"Measuring fusion excitation functions with RIBs and stacked targets: How to deal with the large beam energy dispersions?"

E-7 **Victor Guadilla, IFIC University of Valencia**
"Study of the beta decay of fission products with the DTAS detector"

E-8 **Łukasz Iskra, IFJ PAN Kraków**
"Spectroscopy of neutron-rich ^{96}Y isotope produced in fission induced by cold neutrons"

E-9 **Mateusz Kaczmarski, University of Szczecin**
"On enhancement of the ^{2}H(d, p)^{3}H reaction yield in metallic environments"

E-10 **Joram Ndayishimye, iThemba Labs**
"Chiral bands in ^{193}Tl"

E-11 **Kousuke Ohnishi, Osaka University** – presented by Hang Du
"Reaction cross sections for ^{12}N at intermediate energies and its nuclear structure"

E-12 **Angelina Rusnok, University of Silesia**
"Experimental study of three-nucleon system dynamics in proton-deuteron breakup reaction"

E-13 **Emanuele Strano, University of Padova and INFN**
"Discrimination of processes and reaction dynamics in the ^{17}O + ^{58}Ni collision around the Coulomb barrier"

E-14 **Takanobu Sugihara, Osaka University** – presented by Masaomi Tanaka
"NMR of short-lived beta emitter ^{12}N in water and its new applicability"

E-15 **Yutaro Tanaka, Osaka University** – presented by Hang Du
"Nuclear Structure of ^{6,8}He via reaction cross section measurements"

E-16 **Simone Valdré, University of Florence and INFN**
"Constraining hot sources in central heavy-ion collisions below 20 MeV/u"

E-17 **Barbara Wasilewska, IFJ PAN Kraków**
"The first results from studies of gamma decay of proton-induced excitations at CCB facility"

E-18 **Kenji Nishizuka, Niigata University**
"Measurement of reaction cross sections for $^{9-12}$C isotopes"

T-1 **Mamta Aggarwal, University of Mumbai**
"Search for a rare shape phase of prolate non-collective in neutron rich ^{100}Mo to proton rich ^{100}Sn isobars"

T-2 **Rakesh Kumar Dubey, IUAC New Delhi** – presented by G. Kaur
"Multi-modal nuclear fission of actinide nuclei in heavy ion induced reactions"

T-3 **Alan Dzhioev, JINR Dubna**
"Neutrino processes with hot nuclei in supernovae"

T-4 **Gurpreet Kaur, Panjab University**
"Role of projectile deformation in fusion: Study through quasi-elastic barrier distribution"

T-5 **Daniel Negrea, NIPNE Bucharest**
"Neutron pairing in N=Z nuclei: Quartetting versus pair condensation"

T-6 **Bożena Nerlo-Pomorska, UMCS Lublin**
"Potential Energy Surfaces of Pt-Pu Isotopes in the 4D Fourier Parametrisation"

T-7 **Panagiota Papakonstantinou, Institute for Basic Science, Korea**
"Energy density functional inspired by an effective field theory"

T-8 **Hideo Sakamoto, Gifu University**
"Microscopic study of nuclear quadrupole collective motions in terms of the boson expansion theory"

T-9 **Arora Sangeeta, Thapar University** – presented by Gaurav Saxena
"Structural effects through nuclear charge radius in mass asymmetric collisions"

T-10 **Gudveen Sawhney, Thapar University** – presented by Gaurav Saxena
"Analysis of spontaneous fission in superheavy mass region using the dynamical-cluster decay model"

T-11 **Gaurav Saxena, Govt. Women Engineering College, India**
"Study of N=16 shell closure within RMF+BCS approach"

T-12 **Kazuyuki Sekizawa, Warsaw University of Technology**
"Solitonic excitations in collisions of superfluid nuclei"

T-13 **Obed Shirinda, iThemba Labs**
"Identification of chiral pairs in multiple chiral bands associated with the same nucleon configuration"

T-14 **Timur Shneidman, JINR Dubna**
"Dinuclear system approach to the structure of heavy nuclei"

T-15 **Evgenii Sushenok, JINR Dubna**
"The effect of unpaired nucleons on the β-decay properties of the neutron-rich nuclei"

T-16 **Anna Zdeb, UMCS Lublin**
"Proton and heavier charged particles emission half-lives within a Gamow-like model"

I-1 **Ewelina Bzymek, University of Silesia**
"Test of production of ^{198}Au with the use of linear medical accelerator applied in the typical radiotherapy"

I-2 **Anna Chrobak, University of Silesia**
"Comparison of various models of Monte Carlo GEANT4 code in the range of simulations of gamma production in reactions with 70 MeV protons"

I-3 **Paweł Lasko, IFJ PAN Kraków**
"KATANA – A charge-sensitive trigger/veto array for the SPiRIT TPC"

I-4 **Elena Lawrie, iThemba Labs**
"Proportional crosstalk measurements for a segmented clover detector"

I-5 **Robert Pietrzak, University of Silesia**
"Determination of the perturbation factors for an air plane-parallel ionization chamber used in the proton therapy"

I-6 **Sofya Rymzhanova, JINR Dubna**
"Monte-Carlo event generator for decays and direct reactions"

I-7 **Jerzy Szerypo, Ludwig-Maximilians University Munich**
"Technological Laboratory of the LMU – Status"

I-8 **Dimitry Testov, University of Padova and INFN** – presented by Alberto Boso
"Euclides Si-ball ancillary detector for the Galileo gamma-ray spectrometer"

I-9 **Urszula Wiącek, IFJ PAN Kraków**
"STUMM – Test module for a high intensity neutron stripping source"

I-10 **Wojciech Wróblewski, University of Łódź**
"The optimization of efficiency of the internal conversion electrons spectrometer (ULESE) by the CST software"