XXXVI Mazurian Lakes Conference on Physics

Probing fundamental laws of nature with exotic nuclei and atoms

September 1-7, 2019
Piaski, Poland
PROGRAM

Sunday, September 1

OPENING SESSION

20:00–20:10 Conference Opening

20:10–21:00 Heinz-Eberhard Mahnke

Virtual unfolding of folded papyri

Reception
Monday, September 2\textsuperscript{nd}  
\textbf{Morning Session}

8:30—9:00 \textbf{Andreas Bauswein}

\textit{Constraints on the nuclear equation of state from the gravitational wave signals of neutron-star mergers}

9:00—9:30 \textbf{Ani Aprahamian}

\textit{High precision mass measurements of nuclei and the neutron star merger}

9:30—10:00 \textbf{Walter Pettus}

\textit{Project 8: Towards the atomic tritium future of neutrino mass measurement}

10:00—10:30 \textbf{Hideyuki Sakai}

\textit{Tri- and tetra-neutron search}

\textbf{Coffee Break}

10:50—11:20 \textbf{Yasuhiro Sakemi}

\textit{Fundamental physics with cold radioactive atoms}

11:20—11:50 \textbf{Peter Thirolf}

\textit{Characterization of the elusive $^{229}\text{m} \text{Th}$ isomer - milestones towards a nuclear clock}

11:50—12:20 \textbf{Marek Pfützner}

\textit{Two-Proton Radioactivity – Current status}
12:20–12:50  **Jérôme Giovinazzo**

*Two-proton radioactivity: the interesting case of $^{67}$Kr and further studies*

12:50–13:05  **Dinko Atanasov**

*Search for physics beyond the Standard Model with radioactive $^{32}$Ar beam*

LUNCH

14.00–18.00  **Free afternoon**

SUPPER

**Evening Session**

19:00–19:15  **Natalia Sokołowska**

*$\beta$-delayed proton emission from $^{11}$Be*

19:15–19:30  **Sara Ziliani**

*Spectroscopy of C, N, O, F neutron-rich nuclei with AGATA+PARIS+VAMOS*

19:30–19:45  **Onoufrios Sgouros**

*Study of the $^6$Li+p and $^7$Li+p systems in the Continuum Discretized Coupled Channels approach*

19:45–20:00  **Konrad Czerski**

*Deuteron-Deuteron reaction rates at room temperature: puzzle of cold fusion*

20:00–20:15  **Anastasios Kanellakopoulos**

*Laser spectroscopy on germanium isotopes at COLLAPS-CERN*
Break

20:20—20:35  Fredrik Parnefjord Gustafsson
High-precision laser ionization spectroscopy towards $^{100}\text{Sn}$

20:35—20:50  Zhengyu Xu
Beta-decay study on the neutron-unbound states in $^{133}\text{Sn}$ at ISOLDE Decay Station

20:50—21:05  Monika Piersa
$\beta$-decay studies of neutron-rich $^{135}\text{In}$, $^{134}\text{In}$ and $^{133}\text{In}$ nuclei

21:05—21:10  Varvara Lagaki
MIRACLS: A novel approach for Collinear Laser Spectroscopy

21:10—21:15  Juan Saiz Lomas
Towards a more precise measurement of the $Q(2^+)$ in $^{12}\text{C}$: testing state-of-the-art ab initio theories

21:15—21:20  Javier Diaz Ovejas
Halo effects in the low-energy scattering of $^{15}\text{C}$ with heavy targets

21:20—21:25  Michal Stepaniuk
Beta delayed neutron measurements of $^{87}\text{Br}$ and $^{87}\text{Kr}$ decay by means of Modular Total Absorption Spectrometer
Tuesday, September 3rd

MORNING SESSION

8:30−9:00  Krzysztof Pachucki
   Nuclear charge radii from the isotope shift measurements in ordinary and muonic atoms

9:00−9:30  Evgeny Epelbaum
   High-accuracy calculation of the deuteron form factors

9:30−10:00 Titus Morris
   Quantum computing

10:00−10:30 Piotr Magierski
   Exotic aspects of superfluid dynamics

COFFEE BREAK

10:50−11:20 Guillaume Hupin
   Ab initio description of thermonuclear fusion reactions

11:20−11:50 Peter Schwerdtfeger
   Chemical and physical properties of superheavy elements from Relativistic Coupled Cluster and Density Functional Theory

11:50−12:20 Anastasia Borschevsky
   High accuracy theoretical investigations of heavy elements
12:20–12:50 Jacek Dobaczewski

Nuclear magnetic moments and time-odd properties of density functionals

12:50–13:05 Maciej Konieczka

Precise calculation of $V_{ud}$ matrix element from $T = 1/2$ mirror nuclei in the DFT-rooted No-Core Configuration-Interaction model

Lunch

14.00–18.00 Free afternoon

Supper

Evening Session

19:00–19:15 Paul Garrett

Shape-coexistence in the Ru isotopes; Multi-spectroscopic study of $^{98}$Ru and beyond-mean-field calculations

19:15–19:30 Andras Sveiczer

Studying the exotic decays $^{71}$Kr $\rightarrow$ $^{71}$Br and $^{70}$Kr $\rightarrow$ $^{70}$Br

19:30–19:45 Magda Zielińska

Octupole collectivity across the Zr isotopic chain from Coulomb-excitation studies with the Q3D magnetic spectrograph

19:45–20:00 Silvia Leoni

Search for shape isomers by using the selectivity of heavy-ion transfer reactions

20:00–20:15 Zsolt Podolyák

Neutron-rich nuclei with $N \geq 126$
20:20−20:35 **Giulia Gosta**

*Isospin symmetry breaking in $^{60}$Zn*

20:35−20:50 **Petr Veselý**

*Natural orbitals in the mean-field and beyond mean-field calculations of nuclei*

20:50−20:55 **Paweł Bączyk**

*New energy Density Functional from Quark Meson Coupling model*

20:55−21:00 **Simone Bottoni**

*Exploring the structure of odd-mass isotopes around the $^{132}$Sn neutron-rich nucleus*

21:00−21:05 **Andrzej Staszczak**

*Exotic toroidal nuclei*

21:05−21:10 **Terence Vockerodt**

*Coupled channel wave-packet dynamics for low-energy heavy-ion collisions*

21:10−21:15 **Radu-Emanuel Mihai**

*Investigation of $\Delta T=1$ E1 transition strengths in self-conjugate $^{50}$Mn*

21:15−21:20 **Ryan Llewellyn**

*First Measurements of $B(E2)$s in the N=Z $^{78}$Y and $^{80}$Zr*
Wednesday, September 4th

Morning Session

8:30—9:00  Michael Wiescher

*Neutron sources for the i-Process*

9:00—9:30  Magne Guttormsen

*Experimentally constrained (n, γ) reaction rates relevant to r-process and i-process nucleosynthesis*

9:30—10:00 Anu Kankainen

*Mass measurements for nuclear astrophysics*

10:00—10:30 Ingo Wiedenhöver

*Measurement of d+7Be cross sections for Big-Bang nucleosynthesis*

Coffee Break

11:50—11:20 Naoki Fukuda

*Observation of new isotopes and perspectives on RI-beam production in the next decade at RIKEN RI Beam Factory*

11:20—11:50 Gerda Neyens

*Physics with radioactive beams at ISOLDE and HIE-ISOLDE @ CERN*

11:50—12:20 Hideki Ueno

*Nuclear-physics research based on RI spin orientation technique*
12:20−12:35  Rémy Thoër  
Polarex, a facility for on-line nuclear orientation at Alto: Multipolarity mixing ratio results

12:35−12:50  Jonathan Wilson  
Physics highlights of the nu-ball experimental campaign

12:50−13:05  Karolina Kolos  
Precision beta-decay branching ratio measurements for long-lived fission products

LUNCH

14.00−18.00  FREE AFTERNOON

SUPPER

**Evening Session**

19:00−19:15  Grzegorz Kaminski  
Recent experimental studies at the ACCULINNA-2 separator

19:15−19:30  Adam Broniś  
Conversion-electron spectroscopy in the transfermium region at SHIP

19:30−19:45  Grzegorz Jaworski  
The new neutron detector array NEDA — status and achievements

19:45−20:00  Aleksandra Ciemny  
Exotic decay modes of neutron-deficient silicon isotopes
20:00—20:15  **Barbara Wasilewska**

*A study of γ-decay of the collective states in $^{208}$Pb excited in (p,p') reaction at the CCB facility*

**Break**

20:20—20:35  **Sílvia Viñals Onsès**

*Electron capture of $^8$B into the highly excited states of $^8$Be*

20:35—20:40  **Pavol Mosat**

*Study of K-isomers in $^{255}$Rf*

20:40—20:45  **Amelia Kosior**

*Skyrme-HFB predictions to shape isomerism in neutron-deficient superheavy Z=118-124 isotopes*

20:45—20:50  **Piotr Jachimowicz**

*Fission properties of actinide nuclei within deformed Woods-Saxon model*

20:50—20:55  **Qi Zeng**

*Half-life measurement of short-lived $^{94m}$Ru$^{44+}$ using isochronous mass spectrometry*

20:55—21:00  **Luke Morris**

*Probing superdeformed bands in $^{28}$Si using electromagnetic transitions*

21:00—21:05  **Magdalena Matejska-Minda**

*Investigation of the $K = 3/2^+$ rotational band in $^{45}$Sc - revised lifetime of the $11/2^-$ state*
21:05–21:10 **Giorgia Pasqualato**

*Lifetime measurements in \( ^{105} \text{Sn} \): the puzzle of \( B(E2) \) and \( B(M1) \) strengths in Sn isotopes*

21:10–21:15 **Eleonora Teresia Gregor**

*Transfer reactions with a helicoidal spectrometer at SPES*

21:15–21:20 **Przemysław Sękowski**

*Nuclear reactions in human-like tissues during proton therapy*
Thursday, September 5th

MORNING SESSION

8:30—9:00 Hiromitsu Haba

Present status and perspectives of superheavy element researches at RIKEN

9:00—9:30 Michael Block

Precision measurements of nuclear properties of No, Lr and Rf isotopes at GSI / SHIP

9:30—10:00 Katsuhisa Nishio

Fission studies using multi-nucleon transfer reactions

10:00—10:20 Michal Kowal

Multi-quasiparticle excited states in superheavy nuclei

10:20—10:35 Janusz Skalski

Fission of odd & odd-odd nuclei and isomers

Coffee Break

10:55—11:25 Bertis Rasco

The latest decay heat, \( \bar{\nu} \), and \( \beta \)-delayed neutron results from the Modular Total Absorption Spectrometer

11:25—11:55 Robert Grzywacz

Toward complete studies of beta-delayed neutron emitters
11:55–12:25  Marek Płoszajczak  
Toward the understanding of near-threshold collectivity

12:25–12:45  Michał Ciemała  
Lifetime measurements of excited states in neutron-rich C and O isotopes as a test of the three-body forces

12:45–13:00  Raul de Diego  
Two- and three-body observables in breakup reactions of halo nuclei

13:00–13:15  Antonio Caciolli  
Study of the $^{22}$Ne($p,\gamma)^{23}$Na at LUNA

Lunch

14.00–18.00  Free afternoon  
Supper

Evening Session

19:00–21:00  Poster session

21:00–     Campfire
Friday, September 6th

MORNING SESSION

8:30—9:00  Calin Alexandru Ur

*Exploring the intimate structure of matter at ELI-NP*

9:00—9:30  Thomas Elias Cocolios

*Tb-IRMA-V: Terbium ISOL Radioisotopes for Medical Applications in Flanders*

9:30—10:00 Nicholas Scielzo

*Nuclear-data needs for applications*

10:00—10:30 Marek Lewitowicz

*European strategy for nuclear physics*

Coffee Break

10:50—10:55  T. Czosnyka Prize Ceremony

10:55—11:25 Katarzyna Wrzosek-Lipska

*Shape coexistence studied with Coulomb excitation in the N~104 and N~60 regions*

11:25—11:40  Best Poster Award

11:40—11:50  Z. Szymański Prize Ceremony

11:50—12:20  Javier Menéndez

*Nuclear structure theory for double-beta decay and the interaction of nuclei with dark matter*
12:20–13:05  **Witold Nazarewicz**

*Nuclear theory challenges*

**Lunch**

14.00–16.30  **Free afternoon**

**Supper**

**Evening Session**

17:00–18:30  **Camerata String Quartet Concert**

20:00–         **Conference dinner**
# Poster presentations

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Investigation of preequilibrium emission of protons from (p,xp) reaction with $^{103}$Rh nucleus

Study of the $^9$Be(d,d)$^9$Be, $^9$Be(d,d$'$)$^9$Be, $^9$Be(d,t)$^8$Be, $^9$Be(d,a)$^7$Li reactions in interaction of deuterons with $^9$Be nuclei at energy $E_{d,\text{lab}} = 14.5$ MeV

Fine and hyperfine structure of heavy muonic atoms: Towards the determination of nuclear parameters

Sizes and shapes of very heavy nuclei in high-K states

Lifetime measurements in $^{105}$Sn: the puzzle of B(E2) and B(M1) strengths in Sn isotopes

Material size dependence on fundamental constants

Tests of a cooling system for thin targets submitted to intense ion beams for the NUMEN experiment

Application of equation of motion phonon method in the medium-mass hypernuclei

Study of coupling in $^{28}$Si+$^{144}$Sm through quasi-elastic measurements

Towards a more precise measurement of the $Q(2^+)$ in $^{12}$C: testing state-of-the-art ab initio theories

Nuclear reactions in human-like tissues during proton therapy

Impact of nuclear charge densities on the electronic shell structure for the superheavy elements

Evidence of narrow range high spin population in incomplete fusion

Production of exotic nuclei via multi-nucleon transfer reactions inside gas cells
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