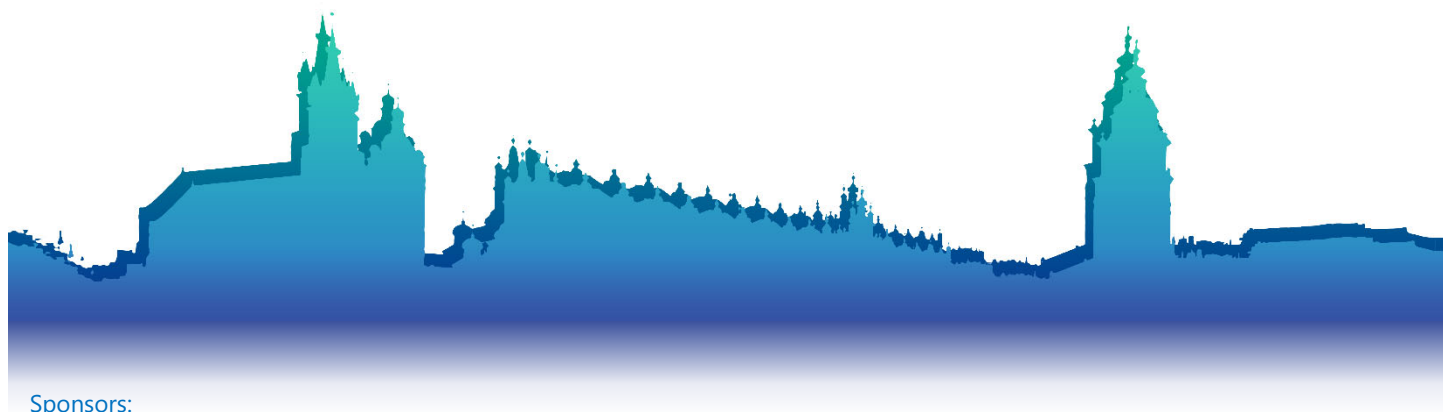




# 4<sup>th</sup> Jagiellonian Symposium on Advances in Particle Physics and Medicine

Collegium Maius & Collegium Novodvorscianum, 10-15 July 2022

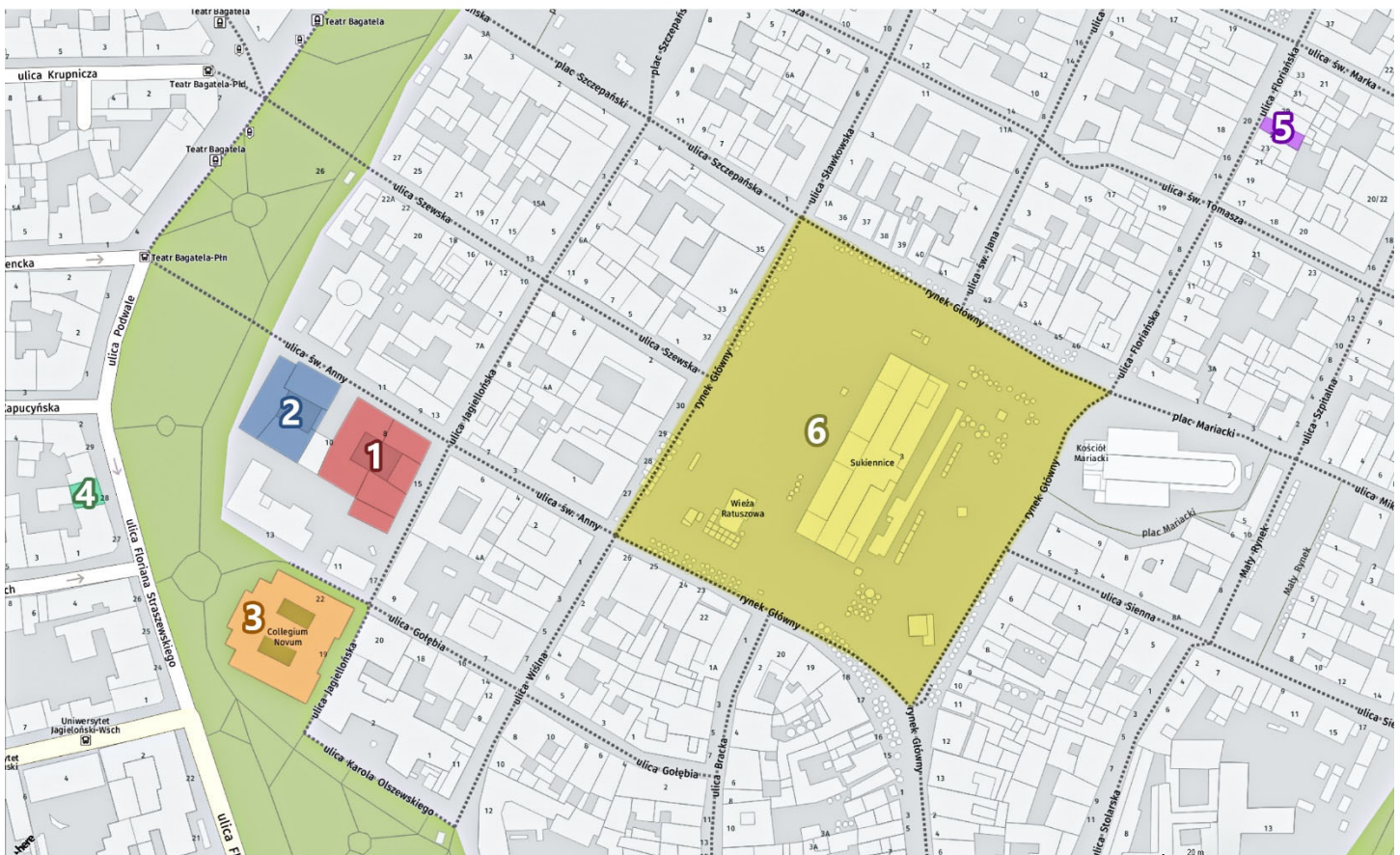


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**Sunday** 10 July 2022 (Collegium Maius)

17:00-19:00 **WELCOME RECEPTION @ Collegium Maius**

18:00-19:00 **GUIDED TOUR THROUGH COLLEGIUM MAIUS**



08:00-08:30 <b>COFFEE A PRIORI</b>		
08:30-09:00 <b>OPENING</b> (Prof. Paweł Moskal, Prof. Ewa Stępień)		
09:00-10:35 <b>Clinical imaging</b> (Chairs: Prof. Paweł Moskal, Prof. Ewa Stępień)		
09:00	<b>Opening talk:</b> Potential Applications of Total Body PET Imaging with Emphasis on CV, MSK and Malignant Disorders	<b>Prof. Abass Alavi</b> University Of Pennsylvania, USA
09:45	<b>Key talk:</b> Clinical and Technical Consideration for Fast TOF PET	<b>Prof. Georges El Fakhri</b> Gordon Center, Massachusetts General Hospital, Harvard Medical School, USA
10:10	<b>Key talk:</b> Idea of theranostics in nuclear medicine. Where we are?	<b>Prof. Leszek Krolicki</b> Medical University Of Warsaw, Poland
10:35-11:05 <b>COFFEE BREAK</b> & Krakow promotion video		
11:05-12:05 <b>PRECLINICAL AND CLINICAL IMAGING</b> (Chairs: Prof. Anna Gromotowicz-Popławska, Prof. Marco Durante)		
11:05	<b>Invited talk:</b> Molecular imaging of human stem/progenitor cells for pro-regenerative purposes	<b>Prof. Maciej Kurpisz</b> Institute Of Human Genetics, Polish Academy Of Sciences, Poland
11:25	<b>Invited talk:</b> Quantitative analysis of tumor hypoxia in nuclear medicine imaging and therapy	<b>Prof. Kuangyu Shi</b> University Of Bern, Switzerland
11:45	<b>Invited talk:</b> Nuclear Imaging in Infective Endocarditis	<b>Prof. Magdalena Kostkiewicz</b> Nuclear Medicine Department, John Paul II Hospital, Poland
12:05-14:00 <b>LUNCH</b> @ Smakołyki Restaurant		
14:00-16:00 <b>POSITRONIUM IN MEDICINE</b> (Chair: Prof. Paul Lecoq, Prof. Stefaan Vandenberghe)		
14:00	First clinical positronium imaging of patients	<b>Prof. Paweł Moskal</b> Jagiellonian University, Poland
14:20	<b>Invited talk:</b> A statistical reconstruction algorithm for positronium lifetime imaging using time-of-flight positron emission tomography	<b>Prof. Hsin-Hsiung Bill Huang</b> University Of Central Florida, USA
14:40	<b>Invited talk:</b> Positron Annihilation Spectroscopy of oxygen content tissue-equivalent samples	<b>Dr Ali Biganeh</b> Nuclear Science And Technology Research Institute, Iran
15:00	Multiphoton time-of-flight MLEM reconstruction for the positronium imaging in J-PET	<b>Dr Roman Shopa</b> National Centre For Nuclear Research, Poland
15:20	Study of positronium in normal and cancer cells	<b>Dr Ewelina Kubicz-Staszekiewicz</b> Jagiellonian University, Poland
15:40	Current progress, challenges and frontiers for Ps-based oncology nanodiagnostics	<b>Dr Bożena Zgardzińska</b> Maria Curie-Skłodowska University, Poland
16:00-16:30 <b>COFFEE BREAK</b>		

16:30-17:50 <b>EXOTIC ATOMS AND NUCLEI</b> (Chairs: Dr Kristian Piscicchia, Dr Magdalena Skurzok)		
16:30	<b>Invited talk:</b> Pionic atoms and chiral symmetry	<b>Prof. Kenta Itahashi</b> RIKEN, Japan
16:50	<b>Invited talk:</b> Alpha and cluster decay of thermally excited nuclei	<b>Prof. Neelima Kelkar</b> University Of Los Andes, Colombia
17:10	<b>Invited talk:</b> Nuclear instabilities in white dwarfs	<b>Prof. Marek Nowakowski</b> University Of Los Andes, Colombia
17:30	Decay probabilities in the multichannel case	<b>Prof. Francesco Giacosa</b> Jan Kochanowski University of Kielce, Poland

19:30-20:30 **BAROQUE CONCERT** @ Collegium Maius

08:00-08:30 <b>COFFEE A PRIORI</b>		
08:30-10:15 <b>PARTICLE THERAPY</b> (Chair: Prof. Saverio Altieri, Dr Antoni Ruciński)		
08:30	<b>Key talk:</b> Biomedical Applications of Radioactive ion Beams: First results of the BARB project at GSI	<b>Prof. Marco Durante</b> GSI Darmstadt, Germany
08:55	<b>Invited talk:</b> Influence of physical uncertainties on proton radiotherapy of moving targets	<b>Prof. Renata Kopeć</b> Institute Of Nuclear Physics, Polish Academy of Sciences, Poland
09:15	<b>Invited talk:</b> Dose-3D - towards measuring radiation dose with spatial granulation	<b>Prof. Tomasz Szumlak</b> AGH University Of Science And Technology, Poland
09:35	<b>Invited talk:</b> A new perspective for NCT: besides cancer, can it be effectively used for Alzheimer's disease?	<b>Dr Nicoletta Protti</b> Pavia University, Italy
09:55	Pilot tests of proton beam range monitoring with J-PET	<b>Dr Jakub Baran</b> Jagiellonian University, Poland
10:15-12:00 <b>POSTER SESSION &amp; CONFERENCE PHOTO #1 &amp; COFFEE @ Collegium Maius Courtyard</b> (Chairs: Dr Łukasz Kapłan, Dr Aleksander Gajos; Poster Award Committee: Prof. Catalina Curceanu, Prof. Ihor Kadenko)		
1	Design and Application for a new intense positron beam at the Antimatter Laboratory in Trento	<b>Luca Povoło</b> , University of Trento, Italy
2	Calibration of Silicon Drift Detectors for the SIDDHARTA-2 Experiment	<b>Aleksander Khreptak</b> , National Laboratory of Frascati (LNF), Italy
3	Monte Carlo simulation platform and software stack in Dose-3D project	<b>Jakub Hajduga</b> , AGH University Of Science And Technology WFIIS, Poland
4	Application of the PALS technique in the investigation of the nanostructure of enzymatic biosensor matrices for biomarkers detection in medical diagnostics	<b>Magdalena Goździuk</b> , Maria Curie-Skłodowska University, Poland
5	Double photon coincidence detection method for gamma-ray imaging in medicine	<b>Mizuki Uenomachi</b> , Kyoto University, Japan
6	Intelligent data analysis for the next generation medical phantom Dose-3D	<b>Kamila Kalecińska</b> , AGH University Of Science And Technology, Poland
7	Silicon as a candidate for a proton beam-activated tracer for range verification in proton therapy	<b>Barbara Kołodziej</b> , Jagiellonian University, Poland
8	Design of spread-out Bragg peaks in spatially fractionation proton therapy	<b>Agata Toboła-Galus</b> , Institute Of Nuclear Physics, Polish Academy of Sciences, Poland
9	Angular DOI Calibration Methods towards PET In-System Calibration of Semi-Monolithic Scintillators	<b>Yannick Kuhl</b> , RWTH Aachen University, Germany
10	Developing a phantom for the positronium imaging evaluation.	<b>Gabriela Łapkiewicz</b> , Jagiellonian University, Poland
11	Estimation of 511 keV gamma scatter fraction in WLS layer in Total Body J-PET ; A simulation study	<b>Keyvan Tayefi Ardebili</b> , Jagiellonian University, Poland
12	Breast Cancer diagnosis study along with the introduction of new detection technology	<b>Shivani</b> , Jagiellonian University, Poland
13	Determination of 10B concentration in melanocytes and melanoma cells	<b>Monika Szczepanek</b> , Jagiellonian University, Poland

14	Detection of concentration and survival of HL-60 human acute promyelocytic leukemia cells by the PALS technique	<b>Katsiaryna Yankova</b> , Maria Curie-Skłodowska University, Poland
15	Study of differences in the composition of glycosphingolipids between the extracellular vesicles from $\beta$ -cell and endothelium cell lines using ToF-SIMS	<b>Magdalena Marzec</b> , Jagiellonian University, Poland
16	Gold nanoparticles as contrast agents for micro-CT imaging	<b>Dominik Panek</b> , Jagiellonian University, Poland
17	Relevance of Monte Carlo simulation validation analysis in the scope of the Dose-3D project	<b>Wioleta Górka</b> , AGH University of Science and Technology, Poland
18	Assessment of the influence of the Beta parameter in the reconstruction of Q.Clear	<b>Konrad Skórkiewicz</b> , Jagiellonian University, Poland
19	Measurement of correlation between polarization of annihilation photons emitted in $e^+e^-$ system to detect entanglement at sub-MeV range	<b>Deepak Kumar</b> , Jagiellonian University, Poland
20	Characterization of spheroid growth based on a new dynamical model	<b>Kamil Dulski</b> , Jagiellonian University, Poland
21	Characterization of the 192-strip J-PET detector for multi-photon positronium imaging	<b>Kamil Dulski</b> , Jagiellonian University, Poland
22	Development of a high-resolution PET detector for small animal in-beam PET system	<b>Munetaka Nitta</b> , Ludwig Maximilians University, Germany
23	Towards improving the sensitivity of testing CPT symmetry in positronium decays with the Modular J-PET detector	<b>Neha Chug</b> , Jagiellonian University, Poland
24	CP Discrete Symmetry study in the decay of ortho-Positronium atom using the J-PET detector.	<b>Kavya Valsan Eliyan</b> , Jagiellonian University, Poland
25	Development of the normalization method for the Jagiellonian PET scanner	<b>Aurélien Coussat</b> , Jagiellonian University, Poland
12:00-14:00 <b>LUNCH</b> @ Smakołyki Restaurant		
14:00-15:40 <b>EXOTIC ATOMS AND NUCLEI</b> (Chairs: Prof. Neelima Kelkar, Prof. Marek Nowakowski)		
14:00	<b>Invited talk:</b> Testing Quantum Foundations in the Cosmic Silence	<b>Dr Kristian Piscicchia</b> Centro Ricerche Enrico Fermi - Museo Storico Della Fisica E Centro Studi E Ricerche "Enrico Fermi", Italy
14:20	<b>Invited talk:</b> A bound diproton: is it "illusive" particle or exotic nucleus?	<b>Prof. Ihor Kadenko</b> International Nuclear Safety Center Of Taras Shevchenko National University Of Kyiv, Ukraine
14:40	<b>Invited talk:</b> Search for $\eta'$ -mesic nuclei in (p,dp) reaction at GSI/FAIR	<b>Dr Yoshiki Tanaka</b> RIKEN, Japan
15:00	<b>Invited talk:</b> A new renaissance for kaonic atoms at DAΦNE: future measurements and perspectives	<b>Prof. Catalina Curceanu</b> on behalf of Dr Alessandro Scordo National Laboratory of Frascati (LNF), Italy
15:20	<b>Invited talk:</b> Sensitivity of the deeply bound pionic atoms to the pion-nucleon sigma term	<b>Dr Natsumi Ikeno</b> Tottori University, Japan
15:40-16:10 <b>COFFEE BREAK</b>		

16:10-18:10 <b>EXOTIC ATOMS AND NUCLEI</b> (Chairs: Prof. Kenta Itahashi, Prof. Francesco Giacosa)		
16:10	<b>Invited talk:</b> Study of the eta-prime meson in nuclei in the LEPS2/BGOegg experiment	<b>Dr Natsuki Tomida</b> Kyoto University, Japan
16:30	<b>Invited talk:</b> Mass modifications of vector mesons in a finite density matter	<b>Prof. Kyoichiro Ozawa</b> Institute Of Particle And Nuclear Studies, KEK, Japan
16:50	<b>Invited talk:</b> Studying the process $\gamma d \rightarrow \pi^0 n d$	<b>Prof. Alberto Martinez Torres</b> University Of Sao Paulo, Brasil
17:10	<b>Invited talk:</b> Exotic properties of $N^*(1895)$ and its impact on photoproduction of light hyperons	<b>Prof. Kanchan Khemchandani</b> Federal University Of Sao Paulo, Brasil
17:30	Polarisation observables Sigma, T, P and H in $\pi^0$ and eta photoproduction off quasifree nucleons	<b>Nicolas Jermann</b> University Of Basel, Switzerland
17:50	Helicity dependent cross sections for the photoproduction of $\pi^0 \pi^\pm$ pairs from quasi-free nucleons	<b>Dr Debdeep Ghosal</b> University Of Basel, Switzerland

<b>08:00-09:00 COFFEE A PRIORI</b>		
<b>09:00-10:05 TOTAL-BODY PET</b> (Chairs: Prof. Abass Alavi , Prof. Catalina Curceanu)		
09:00	<b>Invited talk:</b> New developments and human imaging experience with the PennPET Explorer	<b>Dr Suleman Surti</b> University Of Pennsylvania, USA
09:25	<b>Invited talk:</b> High throughput cost-efficient Flat panel monolithic Walk Through PET	<b>Prof. Stefaan Vandenberghe</b> Ghent University, Belgium
09:45	<b>Invited talk:</b> Developing total-body PET from plastic scintillators	<b>Dr Szymon Niedźwiecki</b> Jagiellonian University, Poland
<b>10:05-10:35 COFFEE BREAK</b> & Krakow promotion video		
<b>10:35-12:00 PET IMAGING INNOVATIONS</b> (Chairs: Prof. Kenji Shimazoe, Dr Sushil Sharma)		
10:35	<b>Key talk:</b> Promising detector concepts to advance coincidence time resolution for time-of-flight positron emission tomography	<b>Prof. Craig Levin</b> Stanford University and University of Leeds, USA
11:00	<b>Invited talk:</b> A new Brain Dedicated PET scanner with 4D detector information	<b>Prof. Jose Maria Benlloch Baviera</b> Institute for Instrumentation in Molecular Imaging CSIC, Spain
11:20	Development of Polarization-Sensitive Positron Emission Tomography Demonstrator based on Single-layer gamma-ray polarimeters	<b>Dr Siddharth Parashari</b> University Of Zagreb, Croatia
11:40	Reconstruction of photon's interaction position within plastic scintillator based on the WLS strips readout	<b>Szymon Parzych</b> Jagiellonian University, Poland
<b>12:00-14:05 LUNCH</b> @ Collegium Novodvorscianum Gallery		
<b>14:05-14:50 ARTIFICIAL INTELLIGENCE FOR MEDICINE</b> (Chairs: Prof. Zdenka Kuncic, Dr Bartosz Leszczyński)		
14:00	<b>Key talk:</b> Artificial intelligence in cardiovascular Imaging	<b>Prof. Piotr Slomka</b> Cedars-Sinai Medical Center, USA
14:25	<b>Invited talk:</b> From High Performance Computing to PET medical imaging - EuroHPC PL software platform for novel techniques and artificial intelligence methods in the context of the total-body J-PET development	<b>Dr Wojciech Krzemień</b> National Centre For Nuclear Research, Poland
<b>14:50-15:20 COFFEE BREAK</b>		



15:20-16:45 <b>PET IMAGING INNOVATIONS</b> (Chairs: Prof. Levin Craig, Prof. Tomasz Szumlak)		
15:20	<b>Key talk:</b> PET imaging innovations	<b>Prof. Taiga Yamaya</b> National Institutes For Quantum And Radiological Science And Technology (QST), Japan
15:45	<b>Invited talk:</b> Multi-isotope imaging and quantum chemical sensing with PET and SPECT nuclides	<b>Prof. Kenji Shimazoe</b> The University Of Tokyo, Japan
16:05	<b>Invited talk:</b> Towards High Sensitivity and High-Resolution PET Scanners; Image-guided Proton Therapy and Total Body imaging	<b>Prof. Karol Lang</b> University Of Texas At Austin, USA
16:25	Polarization and directional correlations of $\gamma$ -rays for nuclei: Scope in PET	<b>Prof. Pragya Das</b> Indian Institute Of Technology Bombay, India

19:30-20:30	<b>Public lecture: ALL IN A THIMBLE! STRANGENESS IN THE NEUTRON STARS?</b>	<b>Prof. Catalina Curceanu</b> National Laboratory of Frascati (LNF), Italy
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08:00-08:30 <b>COFFEE A PRIORI</b>		
08:30-09:55 <b>POSITRONIUM IN PHYSICS</b> (Chairs: Prof. Roberto Brusa, Prof. Bożena Jasińska)		
08:30	<b>Key talk:</b> Interaction of positron and positronium with gases in liquids and development of a new positron beam for advancing such fundamental studies	<b>Prof. Farida Selim</b> Bowling Green State University, USA
08:55	<b>Invited talk:</b> Development of a spatial sensitive detector for positronium inertial sensing measurements	<b>Dr Sebastiano Mariazzi</b> University Of Trento, Italy
09:15	Mirror Matter searches with the J-PET detector	<b>Dr Elena Perez Del Rio</b> Jagiellonian University, Poland
09:35	Precision tests of discrete symmetries in decays of positronium with the J-PET detector	<b>Dr Eryk Czerwiński</b> Jagiellonian University, Poland
09:55-10:25 <b>COFFEE BREAK</b>		
10:25-10:40 <b>CONFERENCE PHOTO #2</b> @ Collegium Novodvorscianum Courtyard		
10:40-12:00 <b>PARTICLE THERAPY</b> (Chairs: Prof. Karol Lang, Dr Katarzyna Dziedzic-Kocurek)		
10:40	<b>Invited talk:</b> Research in Neutron Capture Therapy at University of Pavia	<b>Prof. Saverio Altieri</b> University Of Pavia, Italy
11:00	Towards including radiation quality in proton therapy treatment planning and dosimetry	<b>Dr Jan Gajewski</b> Institute Of Nuclear Physics, Polish Academy of Sciences, Poland
11:20	Safe proton radiotherapy for patients with metallic spine stabilization system	<b>Dr Kamil Kisielewicz</b> Centre of Oncology, Maria Skłodowska-Curie Memorial Institute Kraków Branch
11:40	Dose distribution comparison of cerebrospinal axis irradiation. Helical Tomotherapy vs. Proton Pencil Beam Scanning	<b>Dr Bartosz Kiełtyka</b> The University Hospital In Krakow, Poland
12:00-14:00 <b>LUNCH</b> @ Collegium Novodvorscianum Gallery		
13:00-15:00 <b>PHARMACY MUSEUM TOUR</b> (parallel timing)		
14:00-15:25 <b>RADIOPHARMACEUTICALS</b> (Chairs: Dr Nicoletta Protti, Dr Michał Silarski)		
14:00	<b>Key talk:</b> PET-MRI nanotheranostics with radio-labelled nanoparticles	<b>Prof. Zdenka Kuncic</b> University Of Sydney, Australia
14:25	<b>Invited talk:</b> Compartmental models – a useful tool for medical therapy and diagnosis	<b>Prof. Aleksandra Jung</b> AGH University Of Science And Technology, Poland
14:45	Mesoporous silica carriers for controlled drug release	<b>Dr Radosław Zaleski</b> Maria Curie-Skłodowska University, Poland
15:05	Polymer and composite carriers for controlled drug release	<b>Dr Marek Gorgol</b> Maria Curie-Skłodowska University, Poland
15:25-15:55 <b>COFFEE BREAK</b>		

15:55-17:25 <b>YOUNG RESEARCHERS SESSION</b> (Chairs: Dr Yoshiki Tanaka, Dr Szymon Niedźwiecki)		
15:55	Unsupervised learning for pixel mask clustering and cluster tracking in LHCb's Velopix sensor calibration	<b>Maciej Majewski</b> AGH University Of Science And Technology, Poland
16:10	3D printed lightweight and modular lithium-ion Uninterruptible Power Booster for medical devices	<b>Gabriel Moskal</b> Jagiellonian University, Poland
16:25	The charm of charm	<b>Jakub Ryżka</b> AGH University Of Science And Technology, Poland
16:40	Preliminary results of determining Modular J-PET spatial resolution	<b>Faranak Tayefi Ardebili</b> Jagiellonian University, Poland
16:55	129m,131m,133mXe – for gamma-MRI, a novel medical imaging technique	<b>Mateusz Chojnacki</b> CERN, Switzerland
17:10	The development of the QETIR image reconstruction software for the Total-Body J-PET application	<b>Meysam Dadgar</b> , Jagiellonian University, Poland

20:00-23:00 **CONFERENCE DINNER AT KORZKIEW CASTLE**

08:00-09:00 <b>COFFEE A PRIORI</b>		
09:00-10:05 <b>PARTICLE DETECTION TECHNOLOGIES</b> (Chairs: Prof. Farida Selim, Prof. Taiga Yamaya)		
09:00	<b>Key talk:</b> 10ps Time-of-Flight PET scanner: From Hope to Practice	<b>Prof. Paul Lecoq</b> CERN, Switzerland
09:25	Optimization study of a muon tomography system for imaging of nuclear waste containers	<b>Dr Anzori Georgadze</b> Kiev Institute For Nuclear Research, Ukraine
09:45	Comparative studies of plastic scintillator strips with high technical attenuation length for the total-body J-PET scanner	<b>Dr Łukasz Kapłan</b> Jagiellonian University, Poland
10:05-10:35 <b>COFFEE BREAK</b>		
10:35-12:05 <b>PRECLINICAL IMAGING</b> (Chairs: Prof. Magdalena Kostkiewicz, Dr Gabriele Ciasca)		
10:35	<b>Key talk:</b> PET/CT and SPECT/CT in preclinical research: Systems and applications	<b>Prof. Sibylle Ziegler</b> Ludwig-Maximilian University Of Munich, Germany
11:00	<b>Key talk:</b> Designed Protein Cages: Current State and Potential Medical Applications	<b>Prof. Jonathan Heddle</b> Malopolska Centre of Biotechnology, Poland
11:25	<b>Invited talk:</b> Perspectives of preclinical research in Białystok Center of Molecular Imaging	<b>Prof. Anna Gromotowicz-Popławska</b> Medical University Of Białystok, Poland
11:45	Proteomic profiling of extracellular vesicles derived from pancreatic beta-cells cultured under hyperglycemia	<b>Carina Rząca</b> Jagiellonian University, Poland
12:05-12:35 <b>CLOSING</b> & Awards for The Best Poster and The Best Young Researcher Talk (Prof. Paweł Moskal, Prof. Ewa Stępień)		
12:35-14:35 <b>LUNCH</b> @ Collegium Novodvorscianum Gallery		