Plenary Talk PV I Mon 13:30 HBR 14: HS 1

Mapping Highly-Energetic Messengers throughout the Universe — •Sara Buson — Fakultat fur Physik und Astronomie, Julius-Maximilians-Universitat Wurzburg

Cosmic rays prove that our Universe hosts elusive astrophysical "monsters" capable of continuously and efficiently accelerate particles at extreme energies. High-energy photons and neutrinos may provide the ultimate key to decipher the mystery of cosmic rays. In 2017, the candidate detection of neutrino emission from the direction of the gamma-ray flaring blazar TXS 0506+056 has put forward gamma-ray blazars as promising neutrino point-sources, hence cosmic-ray accelerators. However, to date there is neither a consistent picture for the physical mechanism nor a theoretical framework capable of convincingly explain the full set of multi-messenger observations. This contribution presents initial encouraging steps in this multimessenger (electromagnetic and neutrino) quest and discusses the latest status of the field.

Plenary Talk PV II Tue 9:00 HBR 14: HS 1

Towards the German Center for Astrophysics in Lusatia — •Günther Hasinger — Deutsches Zentrum für Astrophysik, Bahnhofstr. 22, 02826 Görlitz

The German Center for Astrophysics (DZA) is a joint initiative of German astronomy and astroparticle physics. We build a large research center in Goerlitz with a pioneering scientific program, a center for digitalization that brings together the data streams from astronomical observatories around the globe, and a center for the latest technologies that works closely with industry and existing technology centers in Saxony and worldwide. The initial priority is on radio astronomy and the corresponding challenges in the area of **large data volumes and sensor technologies, especially the cooperation with the Square Kilometer Array in South Africa and Australia. We are also conducting research in a unique granite block in Lusatia in the "Sorbian Triangle" between Kamenz, Hoyerswerda and Bautzen, a seismologically very quiet place. An underground research laboratory, the Low Seismic Lab, is to be built there, which will, among other things, enable technology development for gravitational wave detectors, especially the Einstein Telescope. Applications in nuclear astrophysics and future technologies are planned as well.

Plenary Talk PV III Tue 9:45 HBR 14: HS 1

Photonuclear Reactions: Status and Perspectives — •Norbert Pietralla — Inst. f. Kernphysik, TU Darmstadt

Atomic nuclei react with incident photons entirely by the electromagnetic interaction. The latter is understood to any desired precision and allows to separate the reaction mechanism from the nuclear properties under study. Hence, photonuclear reactions [1] can provide precision data on precious nuclear properties. We will discuss examples for recent progress in nuclear structure physics obtained from photonuclear reactions, such as evidence for the necessity of two-body currents in the formulation of magnetic dipole transitions in nuclei [2] or for Raman scattering off the Giant Dipole Resonance of heavy nuclei. The field had been boosted by the advent of intense, fully polarized, quasi-monochromatic, energy-tunable photon beams from laser-Compton backscattering (LCB) processes. Energy-recovery linacs (ERLs) would be the ideal laser-electron colliders. The first demonstration [3] of energy recycling in a multi-turn ERL has now paved the way towards a future ERL-based LCB source. Corresponding R&D in accelerator physics will be presented. The International Research Training Group 'Nuclear Photonics' aims at supporting more than 100 Early-Career Researchers in their doctoral studies in the field. Supported by the DFG and the Hessian Ministry HMWK.

[1] A. Zilges, D. Balabanski, J.Isaak, and N. Pietralla, Prog. Part. Nucl. Phys. 122, 103903 (2022). [2] U. Friman-Gayer et al., Phys. Rev. Lett. 126, 102501 (2021). [3] F. Schließmann et al., Nat. Phys. 19, 597 (2023).

Lunch Talk PV IV Wed 13:00 HBR 14: HS 2

Funding opportunities for Early Career Researchers at DFG — •Manuel Krämer — Deutsche Forschungsgemeinschaft e.V., Kennedyallee 40, 53175 Bonn

The German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) is the central organization for third-party funding of basic research in Germany. It offers a broad spectrum of funding opportunities from individual grants to larger coordinated programmes.

This talk will give an overview of the funding programmes that are tailored to Early Career Researchers. These funding schemes facilitate, for example, research stays abroad or the establishment of a junior research group. I will focus the talk on the Walter Benjamin Programme, the Emmy Noether Programme and the Heisenberg Programme and I will explain the different scopes and aims of these programmes.

Evening Talk PV V Wed 19:30 HBR 14: HS 1

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Plenary Talk PV VI Thu 9:00 HBR 14: HS 1

The muon $g-2$ and the role of hadron physics — •Hartmut Wittig — PRISMA+ Cluster of Excellence and Institute for Nuclear Physics, Johannes Gutenberg University Mainz, Mainz, Germany

The anomalous magnetic moment of the muon, also called the muon $g-2$ parameterises the fraction of the muon's interaction strength with a magnetic field due to quantum corrections. It is a sensitive probe of the Standard Model and play a crucial role in the quest for new physics that may be able to explain the dark matter puzzle or the observed disparity between matter and antimatter. In particular, the observation of a non-zero deficit between experimental measurement and theoretical prediction would signal a quantitative failure of the Standard Model. In this contribution I review the status of lattice QCD calculations of the hadronic contributions to the muon $g-2$ moment, focussing on the hadronic vacuum polarisation contribution which dominates the uncertainty of the Standard Model prediction. This quantity exhibits a tension between recent lattice QCD results and the traditional data-driven dispersive method. I discuss the implications for the running of the electromagnetic coupling and the consistency of global fits using electroweak precision data.

Plenary Talk PV VII Thu 9:45 HBR 14: HS 1

The tragic destiny of Mileva Marić Einstein — •Pauline Gagnon — CERN, Geneva

What were Albert Einstein's first wife's contributions to his extraordinary productivity in the first years of his career? A first biography of Mileva Marić Einstein was published in Serbian in 1969 but remained largely unknown despite being translated first in German, then in French in the 1990's. The publication of Mileva and Albert's love letters in 1987 revealed how they lived together while two recent publications shed more light on Mileva Marić's life and work. I will review this evidence in its social and historical context to give a better idea of her contributions. In this presentation, I avoid all type of speculation and do not attack Albert Einstein personally, but rather strictly stick to facts. The audience will be able to appreciate why such a talented physicist has been so unkindly treated by history.

Plenary Talk PV VIII Fri 9:00 HBR 14: HS 1

Measurement of charge radii and moments of exotic nuclides — •Liss Vázquez Rodríguez for the COLLAPS-Collaboration — Max-Planck-Institut für Kernphysik, Heidelberg, Germany — European Organization for Nuclear Research, Geneve, Switzerland

COLLAPS (COLlinear LAser sPectroScopy) stands at ISOLDE as a pioneering setup in the field of laser spectroscopy. This experiment focuses on the measurement of distinctive nuclear properties of short-lived and exotic radioactive nuclei. These properties include nuclear spins, electromagnetic moments, and charge radii, which are extracted through the hyperfine structures and isotope shifts.

At the heart of COLLAPS's inquiry are fundamental questions about the nature of nuclear existence: What are the limits of nuclear existence? How do simple patterns emerge in complex nuclei? Are there new forms of structure far from stability? To address these questions, the COLLAPS team is dedicated to developing laser spectroscopy techniques of exceptional precision and sensitivity.

An overview of the COLLAPS setup will be given followed by a discussion of some recent results in the tin and lead region.