

# HK 43: Computing and Outreach

Time: Thursday 16:15–17:00

Location: PHIL B 604

HK 43.1 Thu 16:15 PHIL B 604

**Application of the Millepede II algorithm to the NeuLAND time-position calibration** — •YANZHAO WANG<sup>1</sup>, LUCA FLANDOLI<sup>1</sup>, IGOR GASPARIC<sup>2</sup>, and ANDREAS ZILGES<sup>1</sup> — <sup>1</sup>University of Cologne, Institute for Nuclear Physics, Germany — <sup>2</sup>GSI Helmholtzzentrum für Schwerionenforschung, Germany

The New Large-Area Neutron Detector NeuLAND, as part of the R<sup>3</sup>B experiment at FAIR, aims to provide a high detection efficiency and spatial-temporal resolution of neutrons generated from high-intensity radioactive beams[1]. In this talk, we introduce a new calibration method for the NeuLAND detector, based on an adaptation of the Millepede II algorithm. This new method simplifies analysis procedures and, unlike the current method, does not require the reconstruction of cosmic tracks. Major obstacles during the adaptation, such as the rank deficit, limitations on the linear calibration relation and distortion due to noises will also be addressed in the talk.

Supported by BMBF (project 05P24PK1).

[1] K. Boretzky *et al.*, Nucl. Instrum. Methods Phys. Res. A1014 (2021) 165701

HK 43.2 Thu 16:30 PHIL B 604

**From Stars to Life: Astrophysics as a Science Communication Vehicle for Nuclear Physics** — •JONA DREIER and CHRISTIAN KLEIN-BÖSING for the Netzwerk Teilchenwelt-Collaboration — Institut für Kernphysik, Universität Münster

Physics and nuclear/particle physics in particular face the challenge of presenting their complex research methods and abstract findings to a broad audience. It is not only a responsibility to report activities and results to the public, but also essential to build trust in sustained

investment in science and to engage the next generation, opening pathways into physics.

While there is a multitude of highly informative formats, which are mostly accessible to already interested individuals, more easily approachable formats are relatively scarce. Astrophysics and astrobiology offer a promising opportunity to combine a topic that resonates with a broad audience with sophisticated physics research. We present and discuss a concept of workshops and interventions for different age groups that connect stellar evolution with conditions for the emergence of intelligent life. Convection experiments illustrate underlying physical principles, while numerical simulations are used to determine stellar lifetimes.

Supported by NRW-FAIR.

HK 43.3 Thu 16:45 PHIL B 604

**Discover the  $Z_c(3900)$  - a BESIII Masterclass** — •NILS HÜSKEN, ACHIM DENIG, THOMAS LENZ, SASKIA PLURA, and HEIKE VORMSTEIN — Johannes Gutenberg-Universität Mainz

An electron-positron collider like BEPCII provides clean collisions with a small number of particles in the final state. These can be measured and identified with a detector like BESIII applying just a few general principles that are common to many modern particle physics experiments. At the same time, one of the high-profile results of more than 15 years of running BESIII - the discovery of the exotic hadron  $Z_c(3900)$  - really only requires to separate leptons from pions and use energy-momentum conservation to obtain a sizable signal. In combination, our experiment is thus ideally suited for outreach activities. In this talk, we will discuss a new Masterclass using data from the BESIII experiment to (re-)discover the  $Z_c(3900)$ , highlighting a modern breakthrough in hadron spectroscopy from one of the leading experiments in the field.