

T 95: Outreach

Time: Friday 9:00–10:15

Location: VG 1.105

T 95.1 Fri 9:00 VG 1.105

Public Multi-Experiment Higgs Analysis Demonstrator — ACHIM GEISER and •LUCAS KARWATZKI — Deutsches Elektronen-Synchrotron (DESY)

Open data offers new possibilities for a wider audience to access, reproduce and complement active research. In high-energy particle physics many challenges arise, due to several different data formats and large data samples. Therefore, a transformation of the open data to a common data format is used. This enables analysis to be performed within a single workflow and reduces the amount of data and computation time by two orders of magnitude.

Here we present an analysis demonstrator developed in the context of the PUNCH4NFDI consortium showcasing the feasibility of analyzing Open Data from CMS and ATLAS at the same time. Further an example utilizing data from multiple CMS runs will be presented. The demonstrator uses the $H \rightarrow 4\ell$ channel and features various levels of complexity to cater to a wide range of users. This framework guides users from basic visualization of the four-lepton invariant mass spectra to producing the four-lepton invariant mass spectrum from transformed datasets within hours.

The talk will showcase the latest results of the analysis demonstrator, which may be used as an access point for future open data analysis.

T 95.2 Fri 9:15 VG 1.105

Von der Schulbank ins Studium - Nachwuchsförderung — •HEIKE VORMSTEIN und MIA SMIT für die Netzwerk Teilchenwelt-Kollaboration — Johannes Gutenberg-Universität, Mainz, Deutschland

Bekanntermaßen wünschen wir uns mehr Physikstudierende. Um dieses Ziel zu erreichen, ist es entscheidend, jungen Menschen zu zeigen, dass Physik spannend und modern ist. Dieser Vortrag beleuchtet, wie es gelingen kann, Interesse an Physik zu wecken und langfristig bis ins Studium zu begleiten.

Bereits in der Mittelstufe entwickeln viele Jugendliche Interesse an tiefgehenden Themen. Dies bietet eine hervorragende Gelegenheit, moderne Forschung näherzubringen und Begeisterung für Physik zu wecken. Da von der Mittelstufe bis zum Studium mehrere Jahre vergehen, ist es wichtig, das Interesse aufrechtzuerhalten.

Eine ehemalige Teilnehmerin verschiedener Angebote der Mainzer Physik berichtet, wie man junge Menschen dauerhaft für Physik begeistern und sie später im Studium wiedersehen kann. Der Beitrag richtet sich an Lehrkräfte, Wissenschaftler:innen und alle, die sich für eine nachhaltige Nachwuchsförderung in der Physik einsetzen möchten.

T 95.3 Fri 9:30 VG 1.105

CMS Masterclass 2: Discovering the Higgs Boson with Python Notebooks and CMS OpenData — •CHRISTIAN WINTER, ARTUR MONSCH, CEDRIC VERSTEGE, and GÜNTER QUAST — ETP, Karlsruhe Institute of Technology, Karlsruhe, Germany

The current CMS Masterclass focuses on the graphical analysis of event

displays to teach how analyses work in high-energy physics. This Talk focuses on the experience on executing a new CMS Masterclass. In this CMS Masterclass the students use Python Notebooks and CMS OpenData to reconstruct the Higgs discovery channel $H \rightarrow ZZ \rightarrow 4\ell$ and measure the significance of their findings. This Masterclass was carried out for the second time as part of a week-long Science Camp for High School students, which focused on astro-/particle physics. Together with the experience gathered, improvements and the frame for such a Masterclass will be discussed. The possibility for other collaborations to have a similar Masterclass will be addressed, too.

T 95.4 Fri 9:45 VG 1.105

Build Your Own Particle Detector: Workshops for Schools and Universities — •SEBASTIAN LAUDAGE, FLORIAN BERNLOCHNER, and MAIKE HANSEN for the Netzwerk Teilchenwelt-Kollaboration — Physikalisches Institut, Universität Bonn, Nussallee 12, 53115 Bonn

In 2023 and 2024, we developed and tested interactive workshops at the University of Bonn under the motto "Build Your Own Particle Detector." These hands-on workshops enable participants, regardless of prior experience, to construct their own functional particle detector in just a few hours. Participants can then use these detectors to measure cosmic rays or natural background radiation, gaining direct insights into the invisible world of particle physics. Building on the lessons learned from these workshops, we are developing a next-generation detector concept designed to be versatile, user-friendly, and accessible to a broad audience, from school students to university-level participants. To ensure sustainability, we also create comprehensive educational materials that will empower other institutions to host similar workshops independently. This contribution highlights the insights gained from past workshops, outlines our plans for the upcoming year, and provides an update on the development of the new DIY detector system.

T 95.5 Fri 10:00 VG 1.105

Activities of the German LHC-Office for outreach and transfer — •MARIUS HOPFMANN¹, SOPHIA HAVES², LAURA FABIETTI³, STEPHANIE HANSMANN-MENZEMER⁴, ALEXANDER SCHMIDT², and WOLFGANG WAGNER⁵ — ¹Georg-August-Universität Göttingen} — ²RWTH Aachen — ³Technische Universität München — ⁴Universität Heidelberg — ⁵Bergische Universität Wuppertal

Communicating the scientific results to the public and fostering cooperation with partners in industry are key tasks of the German LHC research groups. For this reason in 2020, the research focuses ("Forschungsschwerpunkte" short ErUM-FSPs) of the four LHC experiments have initiated a joint "LHC-Office" which is funded by the Federal Ministry for Education and Research (BMBF). Since then, the LHC-office has established itself as a key stone of the outreach program of the German LHC-FSPs. The office has a multitude of tasks, which include organizing community events, soft skill workshops, industry fair stands and much more. This talk will give an overview of the LHC-office's work of the last years and present an outlook into future activities and possibilities to collaborate.