AGI 1: Data Literacy in the Physics Curriculum

Time: Thursday 11:00–12:30 Location: ZEU/0148

Invited Talk AGI 1.1 Thu 11:00 ZEU/0148

Programming and Computational Physics Education in the Physics Curriculum at University of Göttingen — •Fabian Heidrich-Meisner — Institut für Theoretische Physik, Georg-August-Universität Göttingen

Programming skills and expertise with computational physics are essential competences in the daily work of a physicist. Often, these skills are acquired on the flight, yet in view of qualification standards and evolving expectations from both students and prospective employers, graduates may benefit from standardized training elements in their physics education. Therefore, training in these skills are essential parts in the physics curriculum on the B.Sc. and M.Sc. level at the University of Göttingen. I will introduce our integrated approach, choice of programming languages, and the specific modules that are mandatory parts of our B.Sc. Physics programme. On the master's level, we offer a qualification direction in Theoretical Physics that encompasses a significant amount of training in Computational Physics. B.Sc. in Göttingen can also enroll in an Applied Computer Science track on the B.Sc. level and can specialize in Computational Physics.

Invited Talk AGI 1.2 Thu 11:30 ZEU/0148

Integrating Digitalization and Research Data Management (RDM) into the Curricula of Bachelor and Master Students in Chemistry — •Fabian Fink, Alexander Hoffmann, and Sonja Herres-Pawlis — RWTH Aachen University, Aachen, Germany

Ongoing and increasing digitalization is permanently changing the way research is conducted, experiments are documented, and data are stored. In general, this process requires the support of appropriate research data management (RDM) to enable sustainable research in the first place. [1] Currently, a rethinking takes place in academia focusing especially on the topic of RDM: working groups using electronic laboratory notebooks (ELNs) for documentation, publishers requiring authors to provide a data availability statement to describe how others can access their data, and scientists publishing their research data in repositories to ensure long-term storage and to meet the FAIR data principles (findable, accessible, interoperable, reusable). [2] However, despite the growing awareness of RDM, incorporation of the topic into curricula is largely nonexistent or, if at all, in its infancy.

In this talk, we showcase two initial examples of integrating RDM into bachelor and master studies in chemistry to raise students' attention at an early stage in their careers. Firstly, we present the implementation of an ELN in a bachelor lab course tracked with a survey among the students. Secondly, we show how we use case studies to combine a master lecture on sustainable chemistry with RDM content.

[1] *Angew. Chem. Int. Ed.* **2022**, *61*, e202203038; *Angew. Chem.* **2022**, *134*, e202203038. [2] *Sci. Data* **2016**, *3*, 160018.

Invited Talk AGI 1.3 Thu 12:00 ZEU/0148

News from PUNCH4NFDI: Education of students — •Carsten Burgard and Kevin Kröninger for the PUNCH4NFDI Consortium-Collaboration — TU Dortmund

The consortium Particles, Universe, NuClei and Hadrons (PUNCH) for the National Research Data Infrastructure (NFDI) joins forces of about 9000 scientists from various institutions to establish and promote a "FAIR" science data platform. One part of this initiative is to improve and develop the way we teach data literacy skills as part of the physics curriculum. Modern physicists are expected to have the required excellent data science skills. For this reason, a corresponding discussion must already take place during their studies. This results in a complex task for educators: staying up to speed with all that modern data science has to offer, while striking a balance with other important and demanding topics covered as part of a physics curriculum. Meeting these challenges requires educators of all types to coordinate, invent and exchange ideas on best practices in the field. One first step towards this goal is a detailed assessment and evaluation of existing strategies and methods. We at PUNCH4NFDI conducted a survey to get an overview. Collecting insights on what types of approaches exist and how they are received by the educators and the target audience alike will help to inform the future strategy and motivate advancing data literacy education in the context of physics curricula.