

**Ceremonial Talk** PV VI Tue 14:00 AudiMax  
**The Higgs boson - Deciphering its nature at present and future colliders** — ●KARL JAKOBS — Physikalisches Institut, University of Freiburg

After the discovery of the Higgs boson at the Large Hadron Collider (LHC) at CERN, particle physics has entered a new era. With the successful data taking at the LHC over the past decade, many properties of this particle have been measured and found to be in agreement with expectations from the Standard Model. Despite this, important questions of particle physics, such as the nature of dark matter and the origin of the matter-antimatter asymmetry in the universe, remain open and call for experimental exploration. The Higgs field itself is

linked to deep structural questions of the Standard Model such as flavour, naturalness and the stability of the vacuum. Probed with highest precision at the quantum level, the Higgs boson may hold the key to shed light on some of these questions and to build a bridge between particle physics and cosmology.

In this talk, the role of the Higgs boson in the Standard Model and our present understanding of its properties are discussed. The largely increased accuracy expected to be reached at the High-Luminosity LHC and at the proposed next-generation Future Circular Collider at CERN will turn the Higgs boson into a precision tool. Measuring its self-interaction, rare decays, and couplings with unprecedented accuracy provides high sensitivity to physics beyond the Standard Model and may provide a giant leap forward in the understanding of nature.