理学研究科 物理学専攻
理学部 物理学科 第４回談話会

Future Circular Collider

CERN's Next-Generation Flagship Particle Physics Project

講師：Andreas Hoecker 氏

（欧州素粒子原子核研究機構 CERN）

日時：2026 年 11 月 12 日（木）

１７：００～１８：００

場所：神戸大学

理学部棟 Z103 教室



What comes after the LHC? The 2026 update of the European Strategy for Particle Physics gives a clear answer: the Future Circular Collider (FCC-ee), a 91 km electron–positron ring, is the preferred option for CERN's next flagship collider. Named one of the European Commission's "moonshots" and supported by 162 institutes in 38 countries, the project now heads towards a possible CERN Council decision around 2028 – a choice that could shape particle physics for much of this century.

This seminar presents the physics case and project status. Running from the Z pole to above the top-pair threshold, FCC-ee would deliver 10^4–10^5 times LEP's luminosity per unit of electrical power. With over two million Higgs bosons, it would measure Higgs couplings model-independently down to the per-mille level and the Higgs width to better than one percent; with 6×10^{12} Z decays, it would improve electroweak precision up to 300-fold. Combined with top-quark, W-boson and flavour measurements, this opens an indirect window onto new physics at multi-TeV scales. The talk also covers accelerator and detector challenges, cost, schedule and sustainability, compares FCC-ee with competing proposals, and shows how it paves the way for an energy-frontier hadron collider in the same tunnel.