SYHB 1 Hans-Bethe Symposium I

Zeit: Montag 14:00–15:55 Raum: HV

SYHB 1.1 Mo 14:00 HV

Introduction — •R.M. Dreizler — S. Lyson Professor Emeritus, J.W. Goethe Universität, Frankfurt

Hauptvortrag

SYHB 1.2 Mo 14:15 HV

Quantum Electrodynamics and Nuclear Astrophysics — •E.E. Salpeter — J.G. White Professor Emeritus, Cornell University, Ithaca

Up to 1947 quantum electrodynamics was cumbersome beset by singularities and by the Lamb shift crisis. Hans Bethe's simple formulation of renormalization theory gave a good solution to the Lamb shift problem.I will give personal reminiscences on the importance of his 1947 paper. After Feynman's version of relativistic QED Hans and I formulated a fully relativistic equation for bound state problems. The application to states with a very large binding energy proved to be difficult,but we managed to use the Bethe-Salpeter equation for relativistic corrections to atomic energy levels.

Hans's two papers in 1938/39 on thermonuclear hydrogen burning reactions showed how the sun and other main sequence stars obtain energy for their luminosity.I will give some history leading up to these papers and of the follow up in the 1950s and 60s on energy production in more evolved stars, involving nuclear reactions of heavier elements .

Hauptvortrag

SYHB 1.3 Mo 14:50 HV

Hans Bethe and the Nuclear Age — •K. Gottfried — Cornell University, Ithaca

The lecture will describe the central role played by Bethe in the development of the world's first nuclear fission weapons during World War II; his participation in the invention of the hydrogen bomb; his role as a high-level adviser to the government of the United States; his arms control initiatives; and his outspoken critiques of the policies of the United States regarding nuclear weapons and ballistic missile defense.

Hauptvortrag

SYHB 1.4 Mo 15:25 HV

Theory of the Passage of Energetic Charged Particles through Matter: An Early Application of Quantum Mechanics — •E. Merzbacher — Kenan Professor Emeritus, University of North Carolina, Chapel Hill

With his doctoral training complete in 1928, Hans Bethe was poised to apply the new quantum mechanics to atoms, solids, nuclei and particles. I will focus on Bethe's influential and enduring theoretical study of atomic collisions, initially formulated in his 1930 article in Annalen der Physik, and reviewed in his 1933 review in the Handbuch der Physik. I will attempt to place this paper in its historical context, summarizing earlier work on atomic cross sections and stopping power, and briefly describing the impact Bethe's theories have had on our understanding of the interaction of charged particle beams with target atoms.