

Chapter A: Structure and Organisation of the Physics Department

(by Prof. O. Lechtenfeld)

1. Development of the Subject and its Position within the University

Research in physics at Hannover begins in 1853 when Gustav von Quintus Icilius, a pupil of C.F. Gauß, is called to the Polytechnic as a teacher for physics and mineralogy. After 1879 at its present location (Welfenschloß), his successors on the chair for experimental physics are Heinrich Kayser (1885), Conrad Dieterici (1894), Julius Precht (1906) and Hans Bartels (1935). A second teaching position, for practical physics and photography, is held by Friedrich Paschen (1896), Julius Precht (1901), Johannes Stark (1906), Siegfried Valentiner (1907) and Gustav Leithäuser (1910). Between the wars the physics department of the “Technische Hochschule Hannover” expands its educational services (degree for high school teachers 1921, diploma and PhD degrees 1922) and acquires new chairs, including one in theoretical physics, which 1941-49 is occupied by later Nobel laureate Johannes Jensen. The rebuilding after the war sees three branches: experimental physics, theoretical physics, and applied physics. The latter institute is headed by A. Hinzpeter (1952) and H. Welling (1974) who transforms it into the “Institute for Quantum Optics”; its current director is W. Ertmer (since 1997). In 1962, experimental physics is divided into spectroscopy (A), solid state physics (B) and atomic processes (C, added 1972). Yet, after 1978 A and C become two sections of an “Institute for Atomic and Molecular Physics”, currently headed by C. Danzmann (since 1993) and B. Brehm (since 1973), respectively. As a third section, the “Institute for Plasma Physics”, founded in 1962 by H. Bartels, is added in 1996. Part B, the “Institute for Solid State Physics”, specialises in surface physics with H. Henzler (since 1976). It is boosted in 1995 with a second section, investigating nanostructures under R. Haug, at the cost of soon discontinuing the engagement in plasma physics. The “Institute for Theoretical Physics” triples its permanent staff between 1965 and 1980 and forms research groups in nuclear theory (E. Werner 1965) and in condensed matter theory (H.-J. Mikeska, H.U. Everts 1971). More recently, nuclear theory is being replaced by particle and gravitational theory (Buchmüller 1986, Lechtenfeld 1992), and theoretical quantum optics is added as a third group (Lewenstein 1998), temporarily at the expense of an experimentalist. The fifth unit in the physics department, though not part of the “Lehrinheit Physik”, is the “Institute for Meteorology and Climatology” (R. Roth) which joined in 1978 and is now led by T. Hauf.

Over the past 15 years, the Physics Department has self-imposed and undertaken a process

of concentration on three major directions in research and teaching, namely

- Quantum Optics / Gravitation
- Condensed Matter Physics
- Meteorology

This focussing on priorities has become necessary in order to

- achieve the “critical mass” required for excellency
- create the basis for improved acquisition of external funds
- educate and train our future academic elite more thoroughly.

The narrower scientific profile does not impede synergy: The priority areas complement each other in joint activities exemplified by the investigation of optical properties of condensed matter or the use of optical methods in pollution research. Recently, the thematic centres have been developed and strengthened by

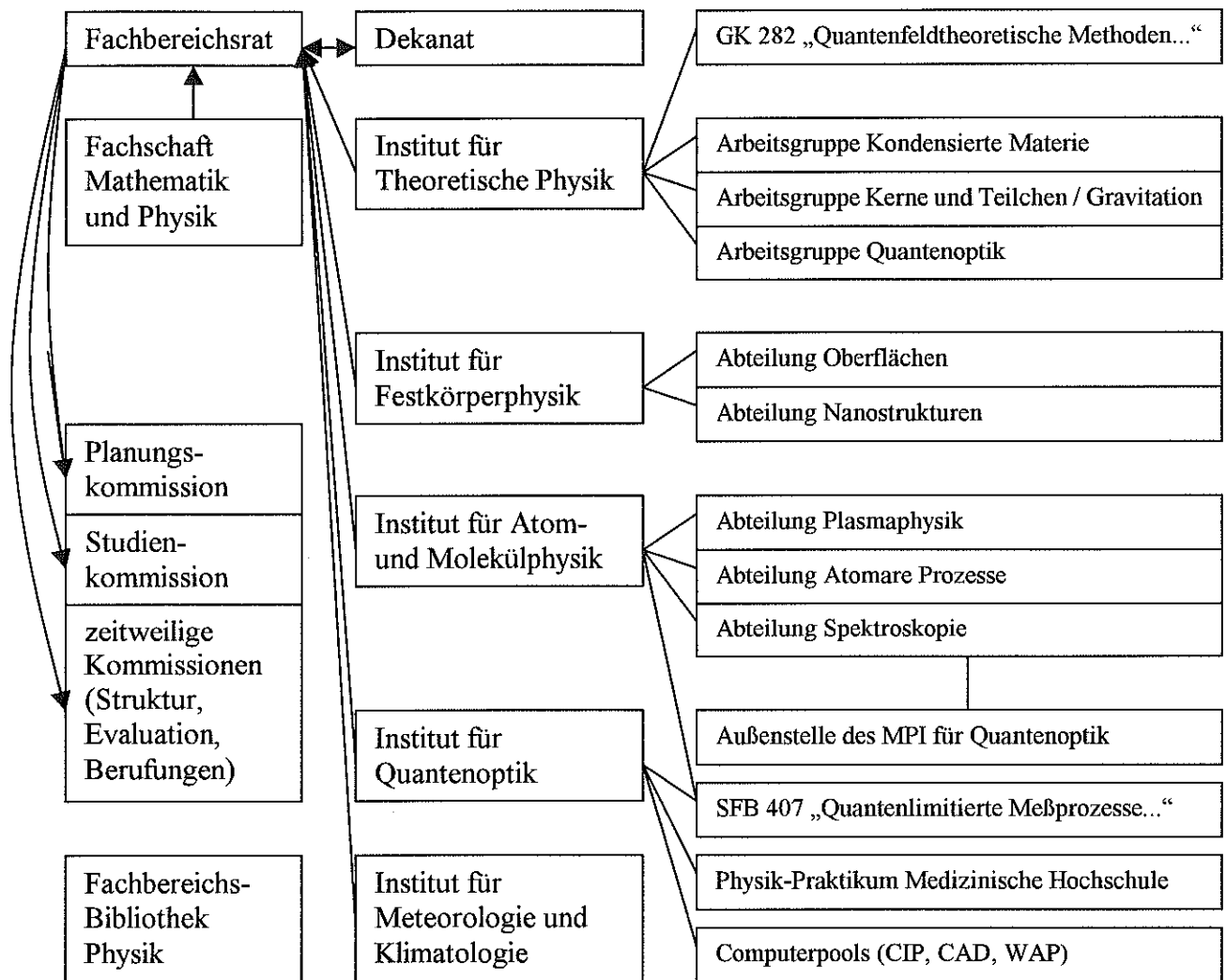
- establishing a gravitational wave laboratory and a corresponding research group (1993)
- opening of a section “nanostructures” within the Institute for Solid State Physics (1995)
- redirecting theoretical physics towards particle and gravitational physics (1986) and quantum optics (1998), forming direct correspondence with experimental priorities
- creating an interdisciplinary research and teaching centre for “nanoelectronics” (1999)
- hiring a fourth professor at the Institute of Meteorology and Climatology (2000).

The deliberate concentration necessarily is accompanied by giving up established research activities: plasma physics and theoretical nuclear physics are being phased out. The restructuring of the Physics Department will be completed by 2005.

Physics plays a central role in the educational program of the university. It provides the foundation for the natural and engineering sciences, underlies the realm of ecology and serves as a basis for industrial advancement and technology transfer. Consequently, the Physics Department interacts with the related departments of mathematics and informatics, chemistry, biology, geosciences, medical science, geodesy and horticulture as well as all engineering sciences, mostly by exporting basic physics competence. The innovation project “nanoelectronics” is a joint effort with the Electrotechnics Department. Meteorology and climatology form an integral part of the Physics Department; 10% of the German meteorologists receive their education here. Within the university, a close cooperation exists with the “Centre for Radiation Safety and Radio-Ecology”.

Furthermore, the Physics Department hosts the DFG-funded special research centre no. 407 “Quantum limited measurements with atoms, photons, and molecules”, a Max Planck group for gravitational wave detection, and the DFG-funded graduate study centre no. 282 “Quantum field theoretical methods in particle, gravitational, and statistical physics”.

2. Institutional Structure and Organisation



Two of the five institutes in the Physics Department are subdivided into sections according to their research emphases, while the Institute for Theoretical Physics consists of three working groups. Each institute elects its director for a two-year period. All status groups within the Physics Department (professors, scientific associates, technical and administrative staff, and students) elect representatives into the department council in which all institutes are represented. This body decides in all departmental issues and delegates certain subjects into commissions which it forms and which report back to it. The department council meetings are conducted by the dean who heads the dean's office and represents the Physics Department within the university. The Max Planck group, SFB 407, GK 282, physics practical at MHH, and the computer pools form separate entities within the department but are associated with certain professors or institutes. The department library is part of the main university library and governed by its central office.

**** Further sections of chapter A will be supplied by Prof. R. Haug ****