Part II

Condensed Matter Physics

The groups of the *Physik-Institut*, which are working in the field of Condensed Matter Physics, comprise experimental and theoretical divisions. The following techniques are used: (a) NMR (nuclear magnetic resonance), (b) NQR (nuclear quadrupole resonance), (c) EPR (electron paramagnetic resonance) (d) μSR (muon spin rotation), (e) the optical laser technique, (f) torque magnetometer and magnetization techniques, (g) photoelectron spectroscopy, (h) electron diffraction.

The experimental studies are concerned with important properties of modern materials such as high-temperature superconductors and superionic conductors, "traditional" substances as metals (high pressure studies), and with the physics of solid surfaces. Other groups investigate non-linear behaviour in laser beams.

A group of theoreticians in computational physics supports the above mentioned experimental groups. The mainly numerical work on high-speed computers comprises investigations such as the microscopic electronic structure of impurities in solids, quantum Monte Carlo simulations and molecular dynamics studies of high-temperature superconductors. In addition the group collaborated with the Institute of Physical Chemistry and the University Hospital.

Part II of this Annual Report presents motivations and results on the following projects:

- NMR/NQR spectroscopy
- μSR and magnetization studies of superconducting materials
- Surface physics
- Laser dynamics
- Computer Assisted Physics.