

Institut für Schicht- und Ionentechnik

**Strukturelle und elektrische
Eigenschaften von epitaktischen,
metallischen und halbleitenden
Siliziden**

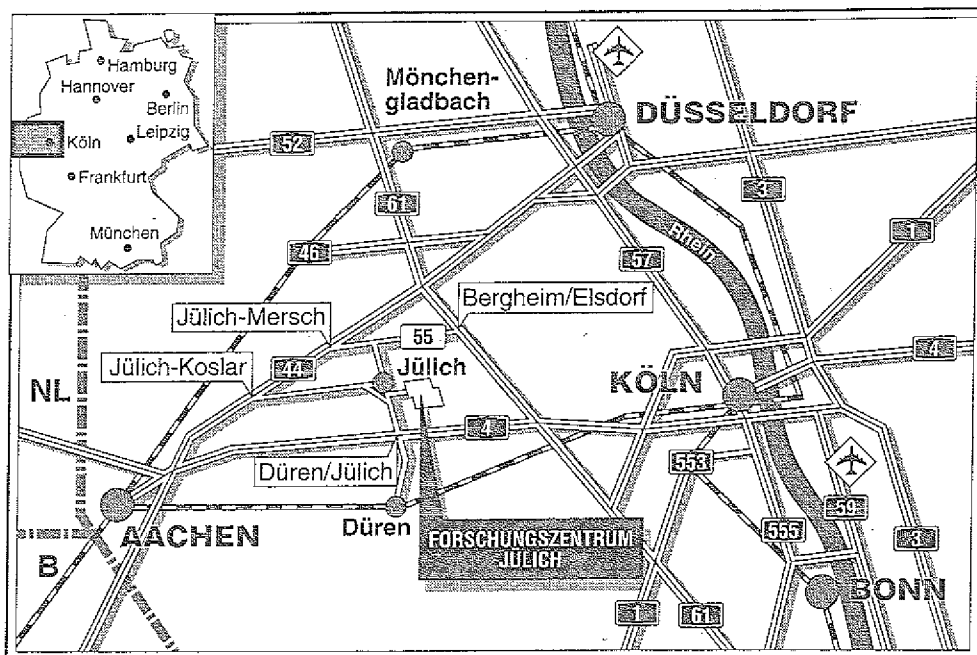
Klaus Radermacher

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localization, Coulomb interaction and superconducting fluctuation. The CoSi_2 layers with thicknesses of 115 Å in (111)Si and 230 Å in (100)Si were also fabricated by Ion Beam Synthesis. The magnetic field dependence of the resistance could be interpreted in terms of two-dimensional weak localisation with strong spin-orbit interaction and an additional classical contribution proportional to B^2 . Long phase coherence lengths of $l_\phi \approx 0.75 \mu\text{m}$ in (111)Si and $l_\phi \approx 2.3 \mu\text{m}$ in (100)Si at 4.2 K were determined by fitting the magnetoresistance data. The inferred inelastic scattering time is interpreted as a sum of a clean limit electron-electron process (dominant below ≈ 6 K) and an electron-phonon process dominant at higher temperatures. Further, a general orientation dependence of the electrical transport properties of these CoSi_2 layers is observed, such as anisotropy in the residual resistance, Hall coefficient and the prefactor for the classical B^2 -dependence of the magnetoresistance. This could be related to multiple band effects in CoSi_2 . The measured relatively long coherent length in CoSi_2 indicate the potential of single-crystalline CoSi_2 for exploring quantum interference effects and the fabrication of novel microstructure devices in which quantum effects play an essential role.

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