

HL 31: Invited Talk: Clemens Rössler

Time: Tuesday 9:30–10:00

Location: EW 203

Invited Talk

HL 31.1 Tue 9:30 EW 203

Quantum structures on ultra clean electron gases — •CLEMENS RÖSSLER, STEPHAN BAER, THOMAS IHN, KLAUS ENSSLIN, CHRISTIAN REICHL, and WERNER WEGSCHEIDER — Solid State Physics Laboratory, ETH Zurich, 8093 Zurich, Switzerland

Since the first observation of the quantum Hall effect, the quality and the mobility of two-dimensional electron gases (2DEGs) have undergone tremendous improvements. 2DEGs defined in $\text{Al}_x\text{Ga}_{1-x}\text{As}$ heterostructures can reach mobilities exceeding $\mu = 10^7 \text{ cm}^2/\text{Vs}$ at low temperatures, facilitating the observation of fascinating phenomena

like the microwave-induced zero-resistance states, the $\nu = 5/2$ quantum Hall state, and interactions between composite fermions.

We investigate the transport properties of nano structures fabricated in high-mobility 2DEGs. Quantum point contacts (QPCs) profit from a strongly suppressed disorder potential, giving rise to the appearance of transport features that are obscured in standard 2DEGs. Within these conceptually simple structures, we find already a rich variety of effects like the 0.7-feature, enhanced g -factors and Aharonov-Bohm interference between edge channels forming near the QPCs. By combining two QPCs, we define quantum dots and Fabry-Perot interferometers which are investigated in the (fractional) quantum Hall regime.