

DS 26: Plenary Talk XI

Time: Wednesday 8:30–9:15

Location: H1

Plenary Talk

DS 26.1 Wed 8:30 H1

Topological Physics in HgTe-based Quantum Devices —

•LAURENS W. MOLENKAMP — Physikalisches Institut (EP3), Universität Würzburg

Suitably structured HgTe is a topological insulator in both 2- (a quantum well wider than some 6.3 nm) and 3 (an epilayer grown under tensile strain) dimensions. The material has favorable properties for quantum transport studies, i.e. a good mobility and a complete absence of bulk carriers, which allowed us to demonstrate variety of novel transport effects.

One aspect of these studies is topological superconductivity, which can be achieved by inducing superconductivity in the topological surface states of these materials. Special emphasis will be given to recent results on the ac Josephson effect. I will present data on Shapiro step behavior that is a very strong indication for the presence of a gapless Andreev mode in our Josephson junctions.

Growing HgTe under compressive strain opens up yet another line of research - the material is readily turned into a topological (Weyl) semimetal, exhibiting clear signs of the Adler-Bell-Jackiw anomaly in its magnetoresistance.