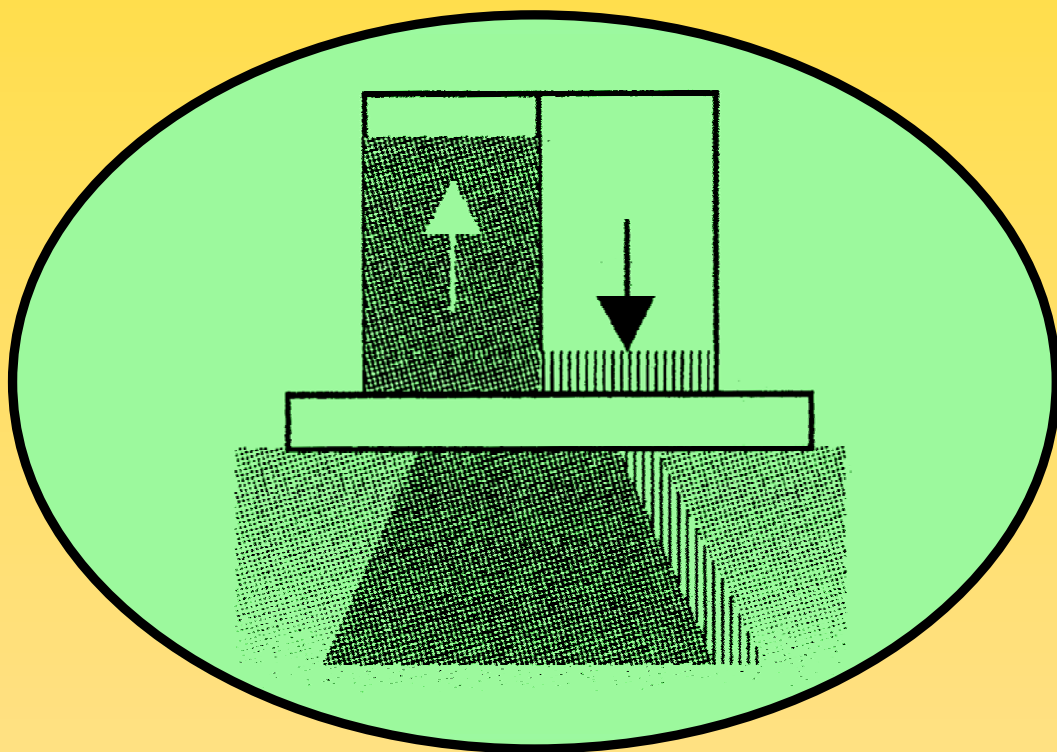


**New phenomena in the
ferromagnetic III-V semiconductors
(Ga,Mn)As and (Ga,Gd)N**

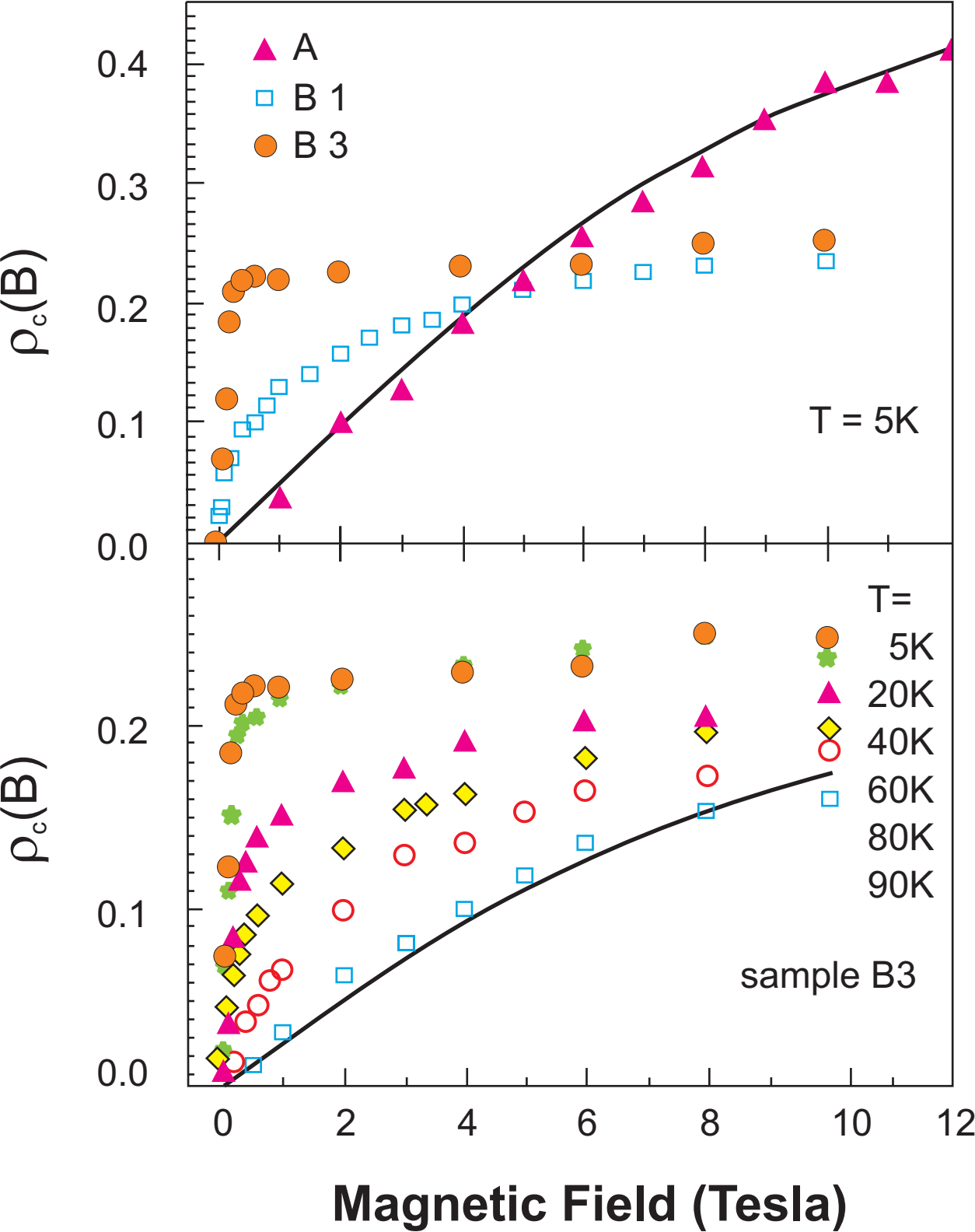


Klaus H. Ploog

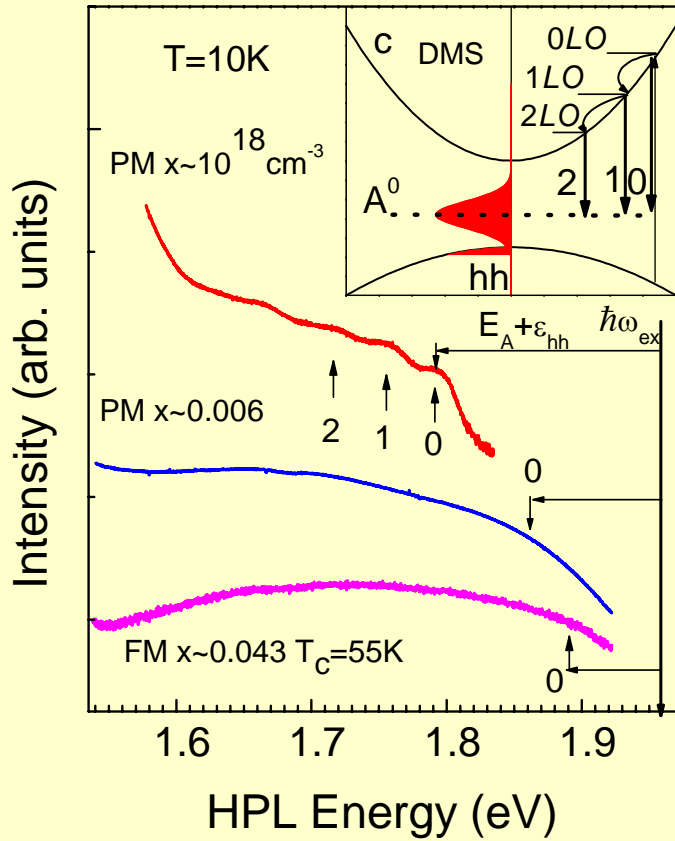
Paul Drude Institute for Solid State Electronics

10117 Berlin, GERMANY

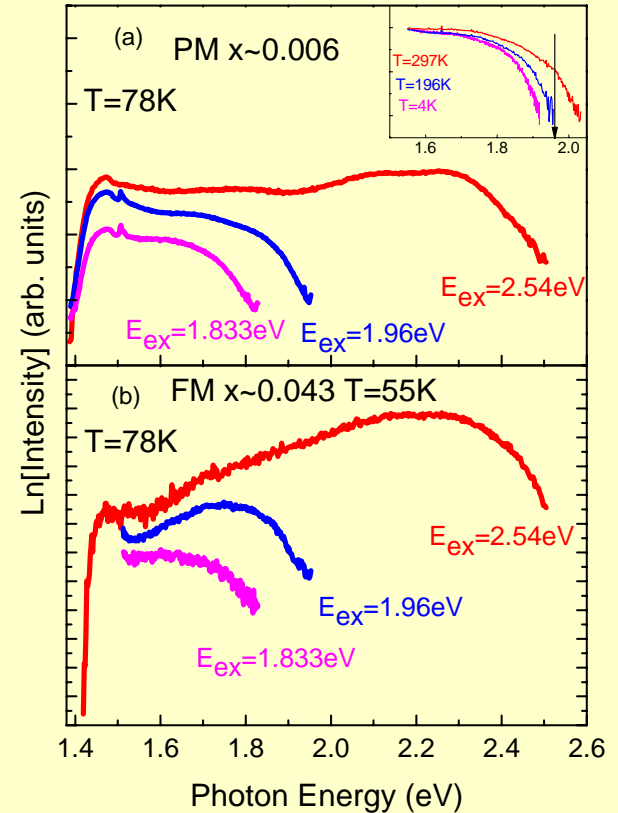
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Hot electron photoluminescence in GaAs:Mn and GaMnAs DMS



$$\tau_{LO} = 10^{-13} \text{ s}$$



$$\hbar\omega_0 = \hbar\omega_{ex} - E_A - \epsilon_{hh}$$

$$20\text{meV} \leq \Delta_{IG} \leq E_A = 113\text{meV}$$

Ternary (Ga,Mn)As on GaAs(001)

- Most prominent ferromagnetic semiconductor studied so far
- Narrow window of optimum growth and post-growth annealing conditions for $T_c > 100$ K
- Amount of incorporated Mn limited to 7 % and T_c of homogeneous ternary alloy limited to 170 K
- Carriers injected in spin injection process are holes
- Origin of ferromagnetism is controversially discussed