

HL 28: Invited Talk: A. Fontcuberta i Morral

Time: Tuesday 14:00–14:30

Location: H17

Invited Talk

HL 28.1 Tue 14:00 H17

Ga-assisted MBE grown GaAs nanowires and related quantum heterostructures — ●ANNA FONTCUBERTA I MORRAL — Ecole Polytechnique Federale de Lausanne, Switzerland — Walter Schottky Institut, Technische Universitaet Muenchen

Nanowires represent model systems for studying a variety of low dimensional phenomena as well as building blocks for the future generation of nanoscale devices. The most exploited nanowire growth technique is the vapor-liquid-solid (VLS) method, which employs gold as a seed for the growth. Synthesis of nanowires by molecular beam epitaxy (MBE) and without using gold as a catalyst gives the opportunity to study nanowires produced in extremely clean conditions

and correlate it with optical and electronic properties. We present the method for growing GaAs nanowires by MBE without using gold as a catalyst. By changing the growth conditions we have managed to obtain high quality radial and axial heterostructures. For the latter, nanowires with atomically sharp zinc-blende/wurtzite heterostructures have been obtained. These structures exhibit novel optical properties for a pure GaAs material. In particular, we show how the emission of the nanowire can be tuned from 1.51 eV down to 1.43 eV. Theoretical calculations of the band alignment between wurtzite and zinc-blende GaAs will be presented to explain the results. Finally, novel applications enabled by these types of quantum heterostructures will be also briefly discussed.