

HL 53: Invited Talk: H. Zandvliet

Time: Thursday 12:30–13:00

Location: H15

Invited Talk

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Self-lacing nanowires on semiconductor surfaces — ●HAROLD ZANDVLIET — MESA+ institute for Nanotechnology and University of Twente, Enschede, The Netherlands

The deposition of Pt or Au on Ge(001) followed by annealing results into well-ordered nanowire arrays. The self-lacing Pt induced nanowires have a cross section of only one atom, are perfectly straight, thousands of atoms long and virtually defect free. The nanowires are composed of dimers that have their bond aligned in a direction par-

allel to the chain direction. At low temperatures the nanowires undergo a Peierls transition: the periodicity of the nanowires doubles from a 2x to 4x periodicity and an energy gap opens up. At low temperatures ($T < 80$ K) novel quasi one-dimensional electronic states are found. These quasi one-dimensional electronic states originate from an electronic state of the underlying terrace that is confined between the nanowires. The Au induced nanowires are composed of dimers as well, however their dimer bond is aligned perpendicular to the chain direction. The electronic, structural as well some intriguing dynamic properties of the nanowires will be briefly reviewed.