This work probes quasi-1D electronic transport in nanowires and nanowire arrays by combining epitaxial synthesis, 4-probe STM measurements, phenomelogical modeling and first-principles electronic structure calculations. It establishes a semi-quantitative correlation between the density and distributions of atomic-scale defects and the I-V curves of nanoscale network devices. Establishing such semi-quantitative correlations between the density and distribution of atomic-scale defects and resulting current-voltage behavior is a critical first step towards designing novel nano architectures with desirable electrical properties.

Reference:

Polaronic Transport and Current Blockades in Epitaxial Silicide Nanowires and Nanowire Arrays

Violeta Iancu †, X.-G. Zhang ‡, Tae-Hwan Kim ‡, Laurent D. Menard §, P. R. C. Kent, Michael E. Woodson §, J. Michael Ramsey §, An-Ping Li ‡, and Hanno H. Weitering *

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Nano Lett., DOI: 10.1021/nl401574c

Acknowledgement of Support: This research was conducted at the Center for Nanophase Materials Sciences, which is sponsored at Oak Ridge National Laboratory by the Scientific User Facilities Division, Office of Basic Energy Sciences, U.S. Department of Energy.