

One-Dimensional Metallic Nanostructures and Heterojunctions Grown Directly on Surfaces

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Our group has been involved in the synthesis, assembly, patterning, and alignment of one-dimensional (1D) metallic nanostructures and heterojunctions directly on surfaces. The top image in the figure to the right shows a scanning electron microscope (SEM) image of Ag nanowires that were chemically grown directly on silicon in a highly-aligned fashion and then purified by removing other-shaped structures with adhesive tape. The bottom image shows an SEM image of GaAs nanowire/Au nanorod 1D heterojunctions synthesized directly on surfaces by combining vapor phase deposition for GaAs with chemical seed-mediated growth for Au nanorods. The controlled synthesis, assembly, and orientation of 1D metals and heterojunctions on surfaces has potential applications in nanoscale electronics, chemical sensing, and plasmonics.

