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A surface-driven route to novel magnetic structures: Manganese on Si(100)(2x1)[1] PETRA REINKE, HUI LIU, CHRISTOPHER NOLPH, University of Virginia — The combination of Silicon with an element with a large magnetic moment such as Manganese is highly desirable for the development of novel spintronics devices. We present a study on the surface-driven synthesis of Mn-nanostructures on the Si(100) (2x1) surface using STM and photoelectron spectroscopy. The Si-surface functions as a template and monoatomic Mn-nanowires are formed, which always run perpendicular to the Si-dimer rows. Their length and spatial distribution is used to derive a model for the wire formation. The bonding of Mn to the Si, which is decisive for the resultant magnetic properties, are presented. The transition to a silicide is kinetically hindered and controlled by the Si- mobility. In the next step a Ge-overlayer is deposited, and analyzed with voltage dependent STM. In the low-adatom-mobility regime the Ge-growth is unperturbed by the presence of Mn, and the Mn-nanostructure is preserved and embedded.

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