The Role of Dangling Bond Diffusion in The Process of Self-Directed Growth of Molecular Assemblies on the H-Si(100)-3x1 Surface: from fabrication towards electrical transport measurements of hybrid silicon-molecular nano structures XIAO TONG, National Institute for Nanotechnology, National Research Council Canada, ROBERT A. WOLKOW, 1. National Institute for Nanotechnology, National Research Council Canada, 2. Department of Physics, University of Alberta, Edmonton, AB, Canada — A chain reaction initiated at a dangling bond on a H- terminated Si(100)-3x1 surface leads to the creation of contiguous, linear multimolecular assemblies. In contrast to a similar growth process observed on the H-Si(100)-2x1 surface, the linear structures grow in the cross-row direction, rather than parallel to dimer rows. This process is enabled by both an uncommonly high rate of H atom diffusion, specifically in the cross-row direction, and a low barrier to H atom abstraction from dihydride sites. These results demonstrate that anisotropy inherent to the substrate can be imposed upon molecular assemblies formed via this “self-directed” growth process. In addition, unlike in the case of styrene where H-abstraction is restricted to adjacent surface sites, resulting in straight multimolecular assemblies, a assembly process follows a meandering path via ring-opening radical clock reactions, which is a new self-directed growth mechanism and kinetic insights, will also be introduced.