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Surface Directed Assembly of Viral Monolayers S. WARGACKI, R. NAIK, D. PHILLIPS, Air Force Research Laboratory, M. FRANCIS, University of California, Berkley, V. WARD, University of Otago, E. THOMAS, Massachusetts Institute of Technology, R.A. VAIA, Air Force Research Laboratory — The facile two-dimensional fabrication of micron-scale patterns of ordered-nanoscale structures on flexible substrates has numerous broad implications, including sacrificial templates for further assembly, deposition or material removal. Previous examinations of block-copolymer assembly on micron-scale patterns with topological and/or chemical relief have demonstrated the ability to not only dictate the larger superstructure of the surface but also to impact the local nano-scale self-assembly and defect stability via confinement. These processes are examined with respect to the surface directed assembly of colloidal particles, specifically rod-like Tobacco Mosaic Virus (TMV) and iscohoderhal viruses *Wiseana* Iridovirus (WIV) and MS2. The unique surface chemistry and shapes provide a complement to traditional colloidal building-blocks. Initially, high throughput processing by convective self assembly (CSA) with orthogonal temperature gradients is combined with chemical modification of Silicon surfaces via soft-lithography to determine the key processing parameters for monolayer assembly. The impact of the viral shape (rod v. iscohodra) as well as the critical range of enthalpic interactions between the virus and substrate that control in-plane order and pattern formation will be discussed.

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