***Atomic membranes and controlled interfaces from 2D materials***



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Two-dimensional (2D) materials represent the ultimate limit in size of both a mechanical atomic membrane and of molecular electronics. Their distinctive structure and lack of dangling bonds means 2D materials remain stable down to a single monolayer and have exceptional mechanical properties: they are the strongest materials in the world yet extremely flexible. As a result, they can be suspended as atomic membranes, transferred on to arbitrary substrates, crumpled up, and stacked on top of one another to form heterostructures. Simultaneously, the growing family of 2D materials provides a correspondingly diverse set of electronic properties—a promising palette for discovering and utilizing emergent phenomena in two dimensions. In this talk, I will discuss the mechanics of atomic membranes, new nanomanufacturing and molecular assembly techniques invented to work with atomic scale structures, and engineering devices which take advantage of the unique nanoscale properties such as tunable nanoelectromechanical systems, high mobility or stretchable molecular electronics.

**Bio:**

*Arend M. van der Zande is an Assistant Professor in Mechanical Engineering at University of Illinois at Urbana-Champaign. His research expertise is on engineering novel nanosystems from nanomaterial building blocks. Recently, he was awarded the NSF CAREER award, and was added to the Clarivate Analytics list of the world’s most highly-cited researchers. Previous to becoming faculty, he earned a Ph.D. in Physics from Cornell University in 2011 and a B.S in Physics and Mathematics from University of California, Santa Cruz in 2003. He then became a postdoctoral fellow in the Department of Mechanical Engineering and the Energy Frontier Research Center at Columbia University. He has published 41+ papers in journals including Nature, Science, Nature Materials, Nature Communications, and Nano Letters.*