|  |
| --- |
| **Spin and pseudospins in 2D semiconductors** |
| Xiaodong XuDepartment of Physics and MSE University of Washington |
| **Abstract**Electronic valleys are extrema of Bloch energy bands in momentum space. Having multiple valleys gives the electron states pseudospin degrees of freedom in addition to their real spin. In this talk, I will discuss our experimental progress on the investigation of spins and pseudospins using atomically thin semiconductors, which are either single or bilayer group VI transition metal dichalcogenides. These new 2D semiconductors behave as remarkable excitonic systems, providing an exciting laboratory for optical manipulation and electrical control of the valley degrees of freedom. I will also discuss strong coupling effects between spin, valley, and layer pseudo-spins in bilayers, which lead to enhanced lifetimes and allow electrical control of spin states. |

 Cartoon showing the valley optical selection rules in monolayer transitional metal dichalcogenides.

**Biography:** Xiaodong Xu has been an Assistant Professor in the Department of Physics and the Department of Materials Science and Engineering at the University of Washington since Sept. 2010. He received his PhD (Physics, 2008) from the University of Michigan and then performed postdoctoral research (2009-2010) at the Center for Nanoscale Systems at Cornell University. Selected awards include DAPRA YFA, NSF Early Career Award, DoE Early Career Award, and Cottrell Scholar Award.