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Exploring photomechanical switching capability and self-assembly of individual molecules on semiconductor surfaces JONGWEON CHO, IVAN V. PECHENEZHSKIY, LUIS BERBIL-BAUTISTA, DANIEL POULSEN, JEAN M. J. FRECHET, MICHAEL F. CROMMIE, University of California at Berkeley and Lawrence Berkeley National Laboratory — Surface-bound photoactive organic molecules reveal substantially different photomechanical switching properties compared to when they are in solution-based environments. Metal surfaces, for example, often reduce photomechanical activity due to molecule-substrate interactions. Semiconductor surfaces are expected to induce different molecular switching behavior due to the presence of a band gap, potentially resulting in longer excited-state lifetimes and enhanced control of photomechanical properties. Here we report our exploration of single-molecule-resolved self-assembly and photomechanical switching capability of azobenzene derivatives on semiconducting GaAs(110) using variable temperature scanning tunneling microscopy.

Jongweon Cho
UC Berkeley and Lawrence Berkeley National Laboratory

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