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Nanowires as AFM cantilevers: A detection scheme to gently image and interact with soft materials in fluids PAUL ASHBY, BABAK SANII, Lawrence Berkeley National Lab — Performing AFM on soft materials in fluids (e.g., living cells) is challenging due to their easy deformation by the tip. The thermal force-noise of the cantilever is the principal limitation to reducing sample deformation and minimizing a cantilever's cross- section reduces its noise significantly. However, the minimum size of the cantilever is currently limited by a conventional deflection detection scheme, which requires a large surface area for laser specular reflection. Here we develop an optical technique to use nanowires as cantilevers, and show that we achieve a force noise in water that is orders of magnitude gentler than conventional AFM. This is a significant milestone towards non-invasive scanning probe imaging of biological processes on the surfaces of vesicles and cell membranes.

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