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**Atomistic constructions using a scanning tunneling microscope.** APARNA DESHPANDE, JOEL VAUGHN, SAW-WAI HLA, Ohio University — We demonstrate an atomic scale construction scheme, which is performed at an area as small as a few tens of nanometer square. In this atomic scale construction site, all the basic building blocks, single atoms, are extracted locally from the substrate using a scanning-tunneling-microscope tip. These extracted atoms are then precisely positioned on the surface to form desired structures. After the completion of the construction, the remaining debris are removed and the undesired holes near the construction site are filled with atoms/clusters to tidy up the area. This entire construction scheme closely resembles our real world construction process and can be considered as its atomic scale analog. This work is supported by NSF grant DMR-0304314 and US-DOE grant DE-FG02-02ER46012.

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