

## Poking from both sides - Reshaping Graphene Landscape Via Face-To-Face Dual Probe Microscopy

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Probing and manipulating single atoms or chemical bonds requires a technique where atomic-scale probes are positioned and controlled with sub-nanometer accuracy. Here, we describe how this can be achieved by using a sample—in our case few-layer graphene—which can be simultaneously accessed from opposing sides. We use a specifically designed dual-probe scanning tunneling microscopy (STM) setup, in which the two probes are at the closest point separated only by the thickness of graphene. This allows us for the first time to directly measure the deformations induced by the STM probe on a free-standing membrane. We reveal different regimes of stability of few-layer graphene, and show how the STM probes can be used as tools to shape the membrane in a controlled manner. Our work also opens new avenues to study mechanical and electronic properties of two-dimensional materials.