

## GRAPHENE AT THE EDGE: STABILITY AND DYNAMICS

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Although the physics of materials at surfaces and edges has been extensively studied, the movement of individual atoms at an isolated edge has not been directly observed in real time. With a transmission electron aberration-corrected microscope capable of simultaneous atomic spatial resolution and 1-second temporal resolution, we produced movies of the dynamics of carbon atoms at the edge of a hole in a suspended, single atomic layer of graphene. The rearrangement of bonds and beam-induced ejection of carbon atoms are recorded as the hole grows. We investigated the mechanism of edge reconstruction and demonstrated the stability of the "zigzag" edge configuration. This study of an ideal low-dimensional interface, a hole in graphene, exhibits the complex behavior of atoms at a boundary.

### References:

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