

## Observation of Natural tracks in Muscovite by AFM

*Friday, April 17, 2026 10:30 AM (30 minutes)*

This study examines tracks found in natural muscovite using atomic force microscopy (AFM). The muscovite samples were etched in 47% HF at 32°C for durations ranging from 6 minutes to 2 hours, and naturally occurring ARTs were observed. Sparse but well-defined ART etch pits were present in all samples regardless of etching duration, indicating that ARTs are revealed rapidly. The track densities estimated by AFM were consistent with those obtained by phase contrast microscopy (Nakamura et al., 2024).

The size and morphology of ARTs varied, and step etch observations of the same area demonstrated the appearance of new tracks as etching progressed. Well etched ARTs exhibited shell like shapes with clear step shaped rims, and the step height corresponded to a single crystallographic layer.

When the muscovite sheets were observed at higher resolution, many more tiny tracks—far more numerous than the ARTs—were detected. The formation mechanism of these tiny tracks remains unknown. Artificial irradiation with various particles is expected to help clarify the origin of these puzzling features.

### Do you plan to give the talk in person?

No

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