Pitt Research

Western Pennsylvania Quantum Information Core
HQ2D Motorized Transfer Station

This precision transfer system is designed for the deterministic transfer of two-dimensional (2D) crystals and thin film materials. The transfer stage provides 9 independent degrees of freedom, enabling researchers to accurately position and transfer atomically thin materials - such as graphene, transition metal dichalcogenides (TMDs), and other van der Waals materials - onto target substrates with precise spatial control. It can be operated inside our glovebox, enabling the processing for air-sensitive materials

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Primary Applications

- Transfer of exfoliated 2D crystals from donor substrates to device substrates
- Heterostructure assembly through sequential stacking of different 2D materials
- Precise positioning of crystals relative to pre-fabricated device structures
- Clean interface preparation for high-quality electronic and optical devices

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System Specifications

- Motorized X, Y, Z travel (sample stage): up to 50 mm
- Motorized rotation (sample stage): 0° to 180°
- Motorized X, Y, Z travel (mask): up to 50 mm
- Motorized rotation (mask): 0° to 90°
- Motorized mask tilt: pitch / Roll up to ± 5°
- Step resolution (X-Y): 0.1 µm
- Rotation resolution: 0.0003°
- Auto focus: included