

## Supporting information

### Silicene growth through island migration and coalescence

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Supporting movie 1: Nucleation and growth of silicene monolayers on Ir (111) at 300 K with a deposition rate of 1000 atoms/ns.

Supporting movie 2: Nucleation and growth of silicene monolayers on Ir (111) at 500 K with a deposition rate of 1000 atoms/ns.

Supporting movie 3: Nucleation and growth of silicene monolayers on Ir (111) at 700 K with a deposition rate of 1000 atoms/ns.