

Supplementary Information

In Fig. S1b, it is evident that the PL intensity of a bi-layer WS₂ is already quenched significantly with regard to the monolayer. Apart from the enhanced intensity at the A_{1g} peak, the bi-layer WS₂ has characteristic E_{2g}¹/A_{1g} peak difference slightly greater than monolayer WS₂ as demonstrated in Fig. S1c, which agrees proportionally with Ref 17.

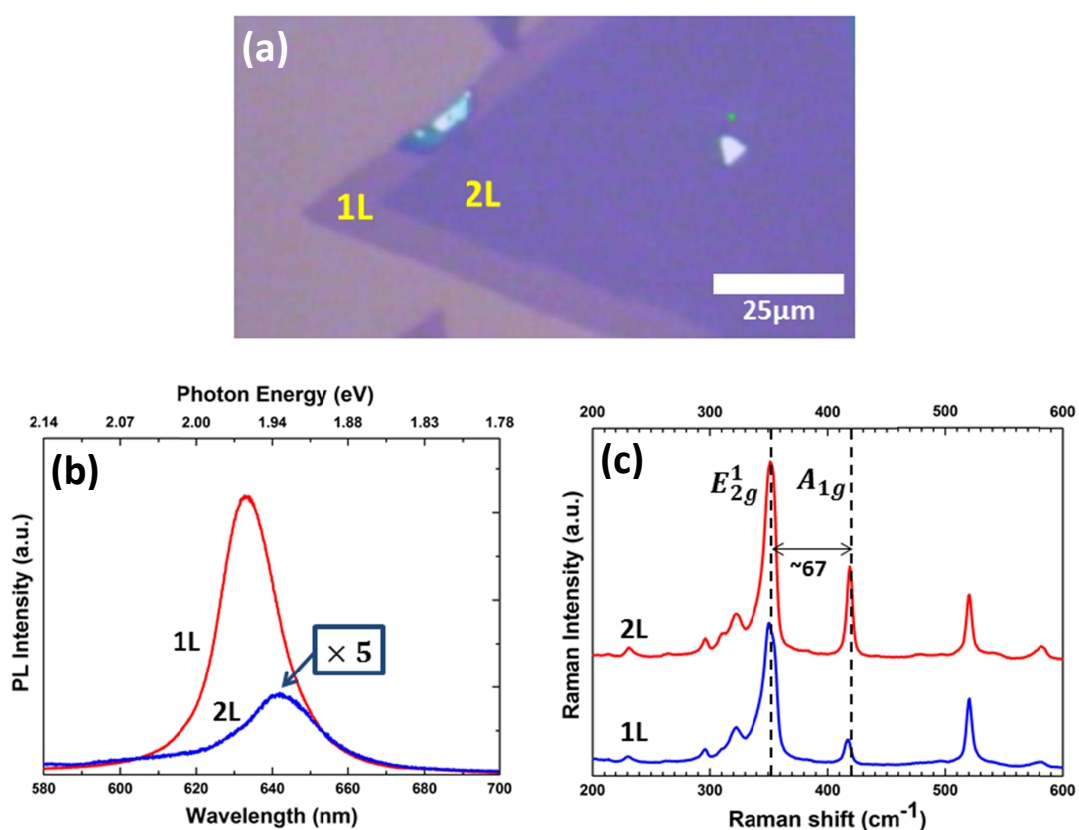


Fig. S1 PL and Raman characterization of WS₂ monolayer (1L) and bi-layer (2L) domains. (a) Optical image of the as-examined WS₂ domain. (b and c) Characteristic PL and Raman profiles of the corresponding 1L and 2L WS₂ domains indicated in (a).

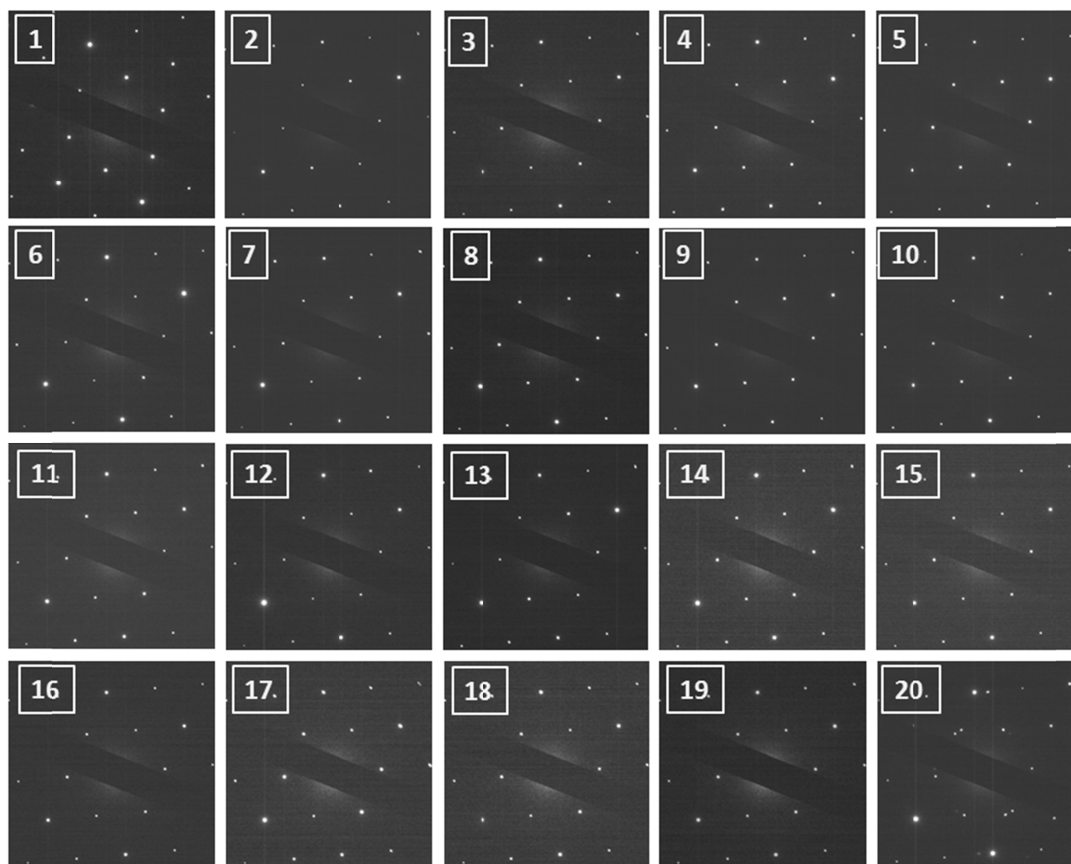


Fig. S2 Full exhibition of SAED patterns of the as-produced WS₂ domain taken from 20 consecutive SiN TEM holes highlighted in Fig.5 (main text).