

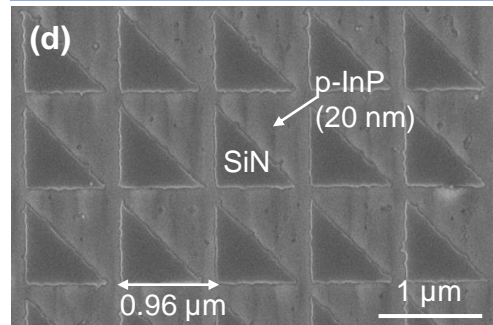
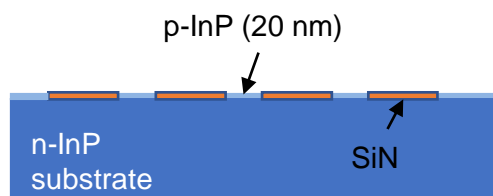
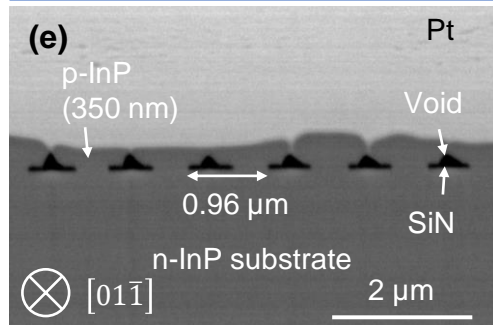
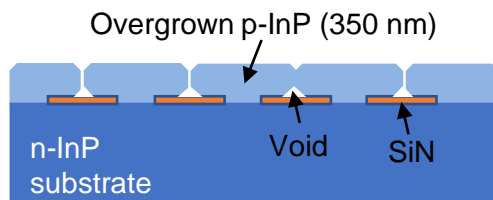
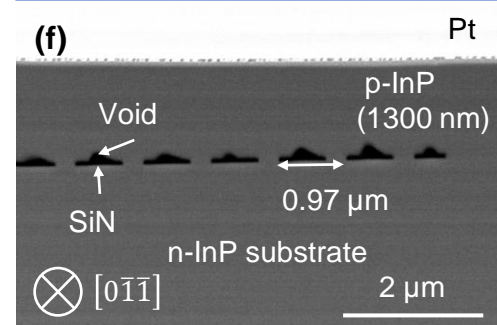
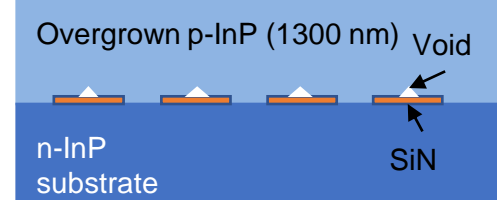
(a) Initiation of selective growth**(b) Start of coalescence****(c) Top surface planarization**

Fig. 1. (a)-(c) Cross-sectional schematics after 20, 350, and 1300 nm of p-InP ($p=10^{18}\text{cm}^{-3}$) growth on patterned n-InP substrate. Pattern consists of isosceles-right-triangles (side length = 965 nm) of SiN (40 nm thick); (d) plan-view SEM after 20 nm growth showing selectivity; (e) and (f) XSEM after 350 and 1300 nm of p-InP growth.

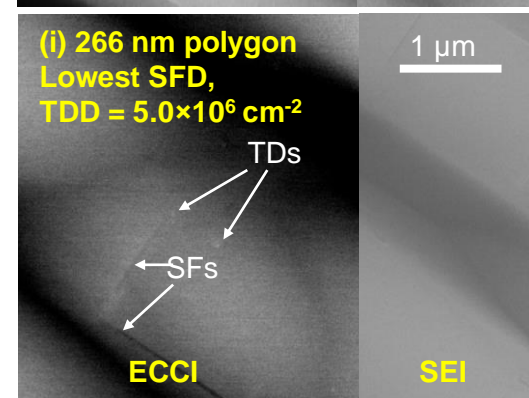
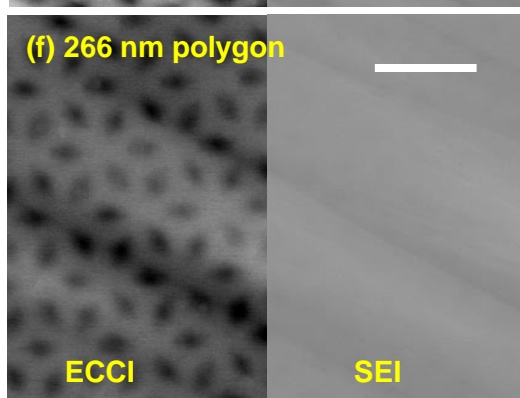
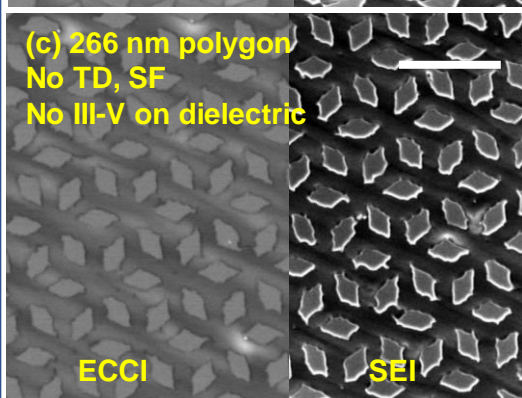
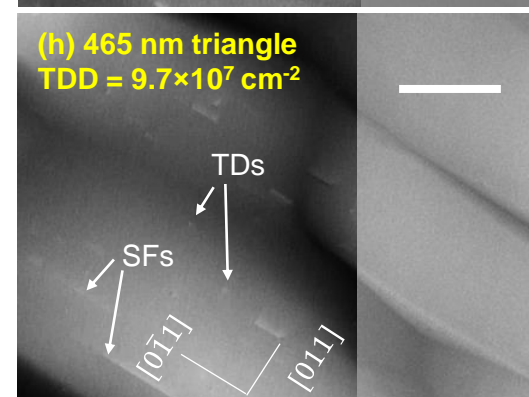
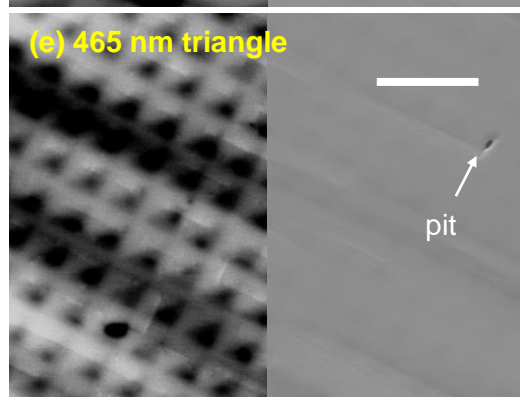
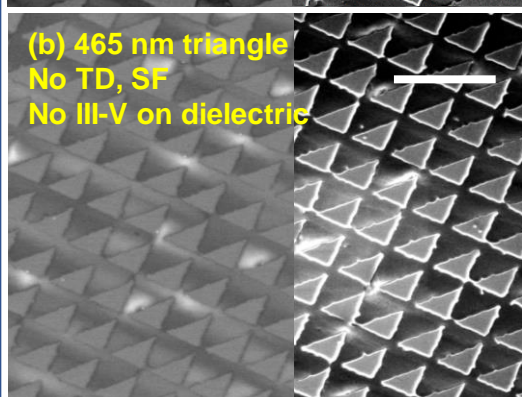
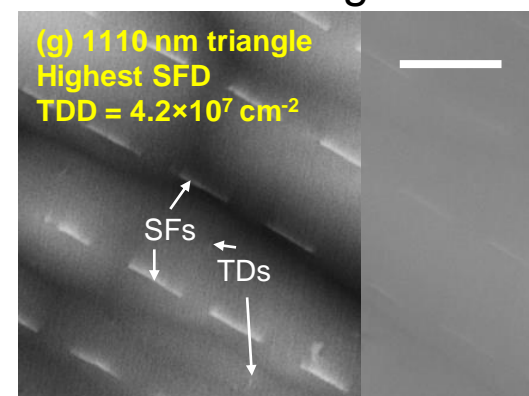
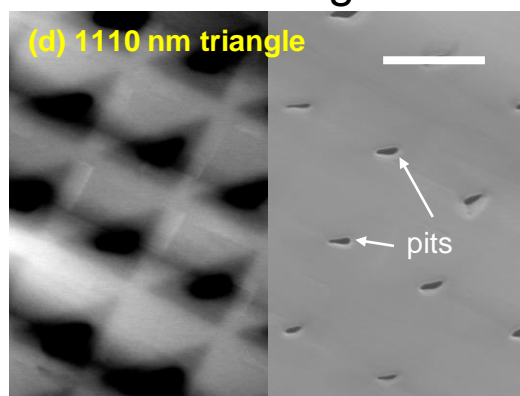
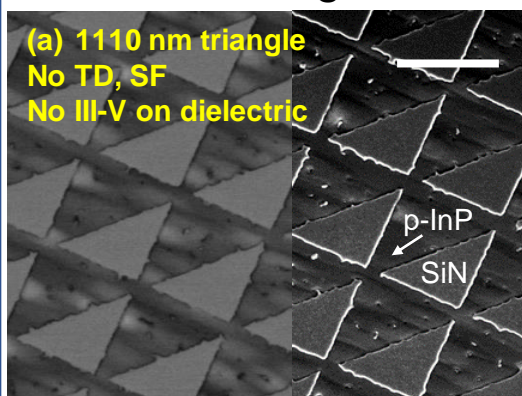
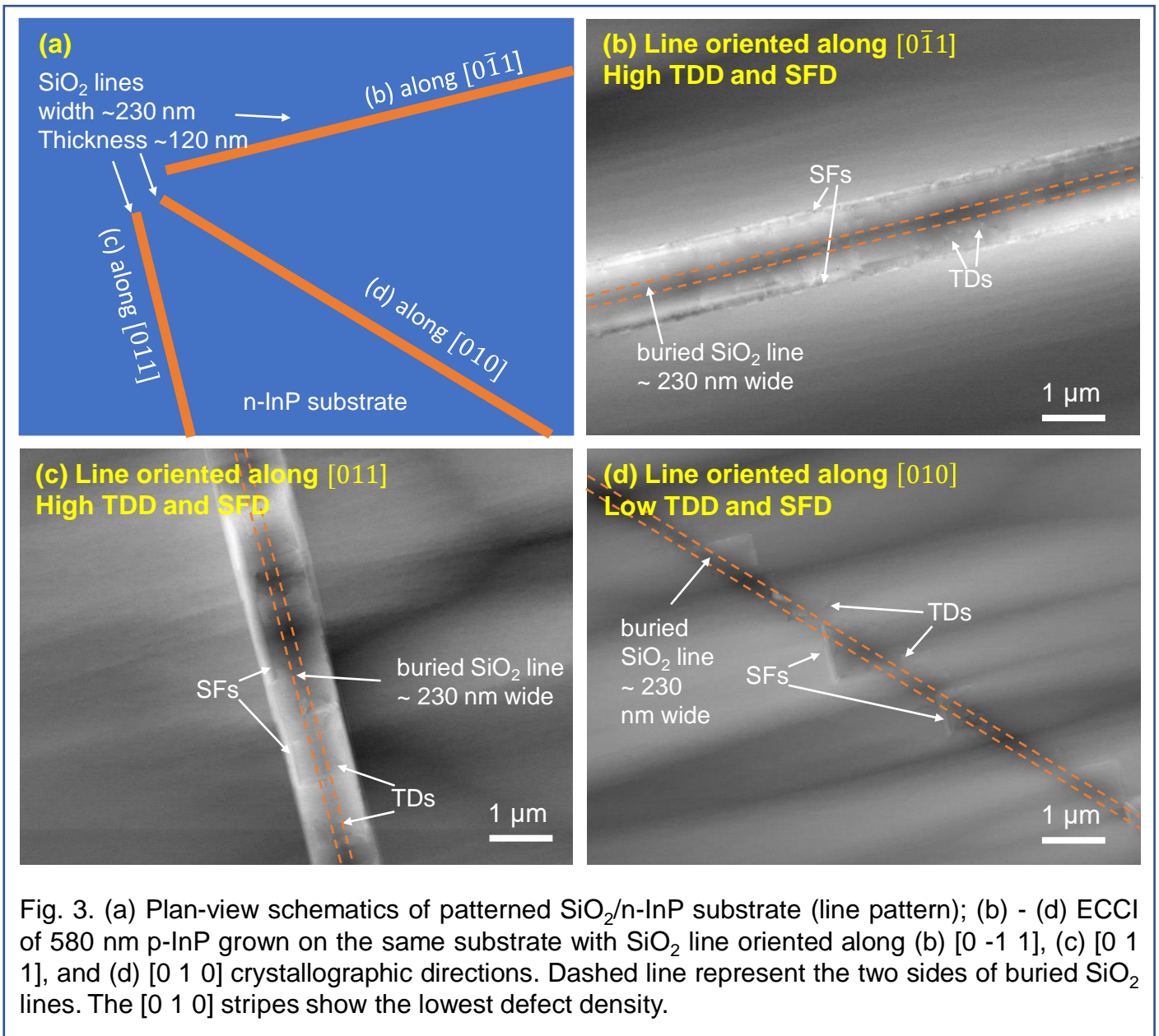
20 nm InP growth**350 nm InP growth****1300 nm InP growth**

Fig. 2. (a) - (c) ECCI/SEI of 20 nm p-InP grown on patterned SiN/n-InP substrate with feature size of (a) 1110 nm, (b) 465 nm, and (c) 266 nm; (d) - (f) ECCI/SEI of 350 nm p-InP grown on similar patterns; (g) - (i) ECCI/SEI of 1300 nm p-InP grown on similar patterns. SF = Stacking fault, TD = threading dislocation, SFD/TDD refers to density. Scalebar = 1 μm.



References

- [1] K. Hirose et al., *Nature Photonics* 8, no. 5 (May 2014): 406–11.
- [2] Z. Wang et al., *Materials Science and Engineering: B* 177, no. 17 (October 2012): 1551–57.
- [3] D. Ironside et al., *Progress in Quantum Electronics* 77 (May 2021): 100316.
- [4] M. Fahed et al., *Nanotechnology* 26, no. 29 (July 24, 2015): 295301.