Electronic Supplementary Information (ESI)

Directional scrolling of SiGe/Si/Cr nanoribbon on Si (111) surfaces controlled by two-fold rotational symmetry underetching

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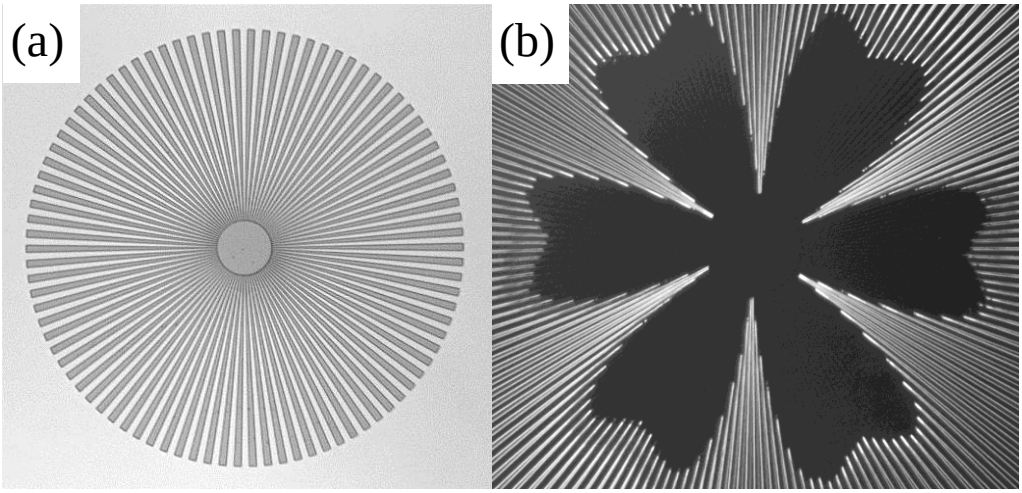
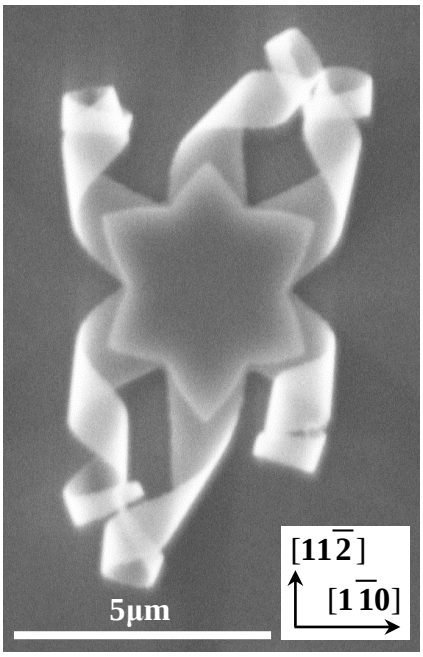
Supplementary-Figure 1



Supplementary-Figure 1. (a) Wagon wheel pattern (b) SEM image of lateral underetching profile on Si (111).

S-Fig.1(a) show that a wagon wheel shaped pattern [1] were designed for Si (111) substrate to investigate the dependence of lateral underetching rate on the crystallographic orientation of mesa lines. As presented in S-Fig.1(b) after etching the Si (111) substrate with a wagon wheel pattern, a snowflake-like figure developed. The underetching profile shows a 6-fold symmetry with twelve fastest etching directions.

Supplementary-Figure 2



Supplementary-Figure 2. SEM top view images of $Si_{0.6}Ge_{0.4}$/Si/Cr helices with layer thickness of 8/10/15nm. The $[1\bar{1}0]$ and $[11\bar{2}]$ orientation on the substrate is shown by black arrows. Six tapered stripes are aligned in the <112> and form roll-shape helices. The four right hand helices and two left hand ones show a 2-fold rotational symmetry.

REFERENCES

1. H. Seidel, L. Csepregi, A. Heuberger, and H. Baumgartel, *Journal of the Electrochemical Society* 1990, **137**, 3612.