



第271回 OPERA研究交流セミナー

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第329回 未来化学創造センターセミナー



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Creation of thin films on artificially designed three-dimensional shaped Si surfaces and singular properties induced by shape

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This work establishes a surface-science framework for artificially designed three-dimensional (3D) silicon architectures, integrating lithographic fabrication, atomic-scale surface ordering, and thin-film growth on facet-defined geometries. Atomically reconstructed Si{111} facet surfaces were realized on line and pyramid structures while preserving shape integrity through RCA cleaning and reduced-temperature flashing, and selective thin-film deposition on specific facets was demonstrated.

Shape-originated physical phenomena were identified. Here I will present a notable result that ferromagnetic Fe films on 3D pyramid geometries can stabilize magnetic vortex states drastically, while two-dimensional (2D) planar Fe films never stabilize vortex. This is a new concept demonstrating that shape-induced geometry itself functions as an active design parameter for material properties on the basis of surface science.

主催: 九州大学 最先端有機光エレクトロニクス研究センター
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