**High Resolution Nano-scale Patterning Performed by Atomic Force Microscopy Lithography**

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Atomic Force Microscopy (AFM) Lithography can precisely perform specific patterning at nano-scale locations and create nano-structures confined to specific areas due to imaging functions. This technology can induce various physical and chemical processes on the surface of the substrate based on the interaction between the probe and the substrate. It can be classified into two main categories. ⅰ) Contact Lithography ⅱ) Non-Contact Lithography. Contact Lithography is a method that uses the interaction between the tip and substrate by applying a large force to the tip to make a pattern. Non-Contact Lithography is a method of making patterns by forming an oxide layer by adjusting tip bias.

In this study, we designing patterned using Contact Lithography and Non-Contact Lithography methods on a silicon substrate using nano-scale tips. By changing the drawing speed of the tip and the force applied, precise patterning is performed to identify the tendency and control it to the desired size. This is a technology that will be widely applied in various aspects in the future.