

# Photoalignment and Photomechaical Materials

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## HOMEPAGE

<http://www.apchem.nagoya-u.ac.jp/06-BS-2/sekilabo/index.html>



Prof. Takahiro Seki

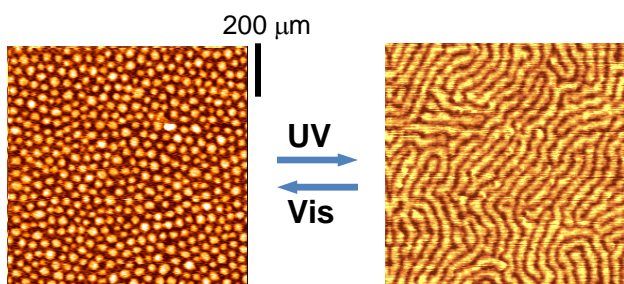


Designated Associate  
Prof. Mina Han

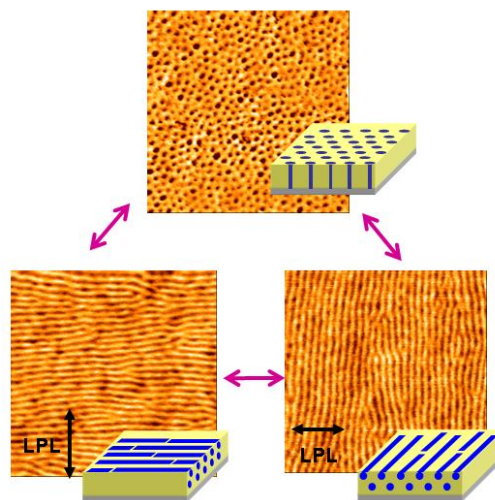
## Smart photoresponsive softmaterials

### Photoinduced morphological changes and photoalignment

Block copolymers containing an azobenzene moiety, a typical photochromic unit, are synthesized. Photoirradiation can alter the microphase separation structures. When linearly polarized light are used, the microphase separation structure are aligned orthogonal to the polarization direction.

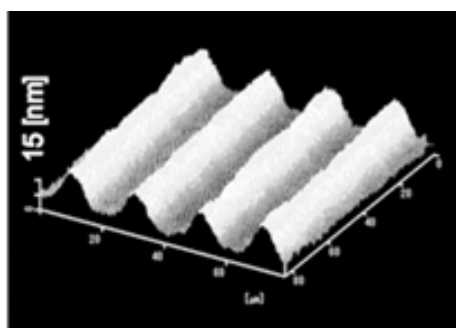
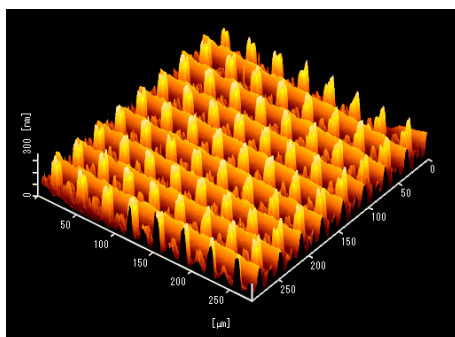


Photoinduced microphase separation structure (upper) and photoaligned meso-cylinders by polarized light (right, LPL denotes the direction of the linearly polarized light).



### Phototriggered mass migration

When patterned light is irradiated onto a liquid crystalline azobenzene-containing polymer film, an efficient mass migration occurs, which results in on-demand relief formation. Both positive and negative patterns are available by selecting the wavelength of shined light. A relief structure of inorganic material is also obtained via the mass transport process.



An example of the resulting relief structure of a polymer thin film (left) and a titania (anatase) relief film formed via phototriggered mass migration of a fluid precursor (right).