


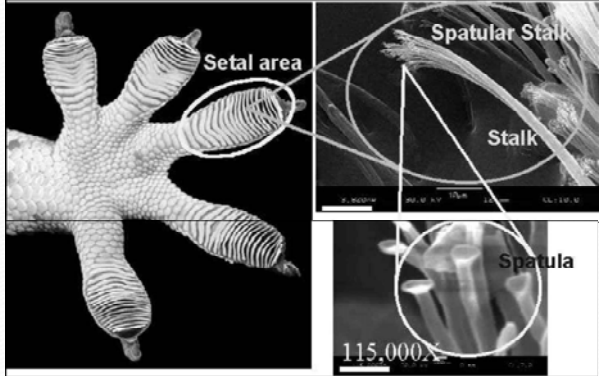
Bio-mimic Gecko Tape

 **臺灣大學** National Taiwan University


Introduction

– Nanohair Structure, Gecko Toe

- Geckos rely on nanohairs to adhere to ceilings and vertical walls



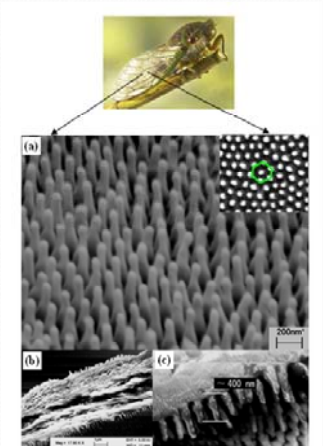
Metin Sitti et al.
J. Adhesion Sci. Technol., Vol. 17, No. 8, pp. 1055–1073 (2003)

 **臺灣大學** National Taiwan University

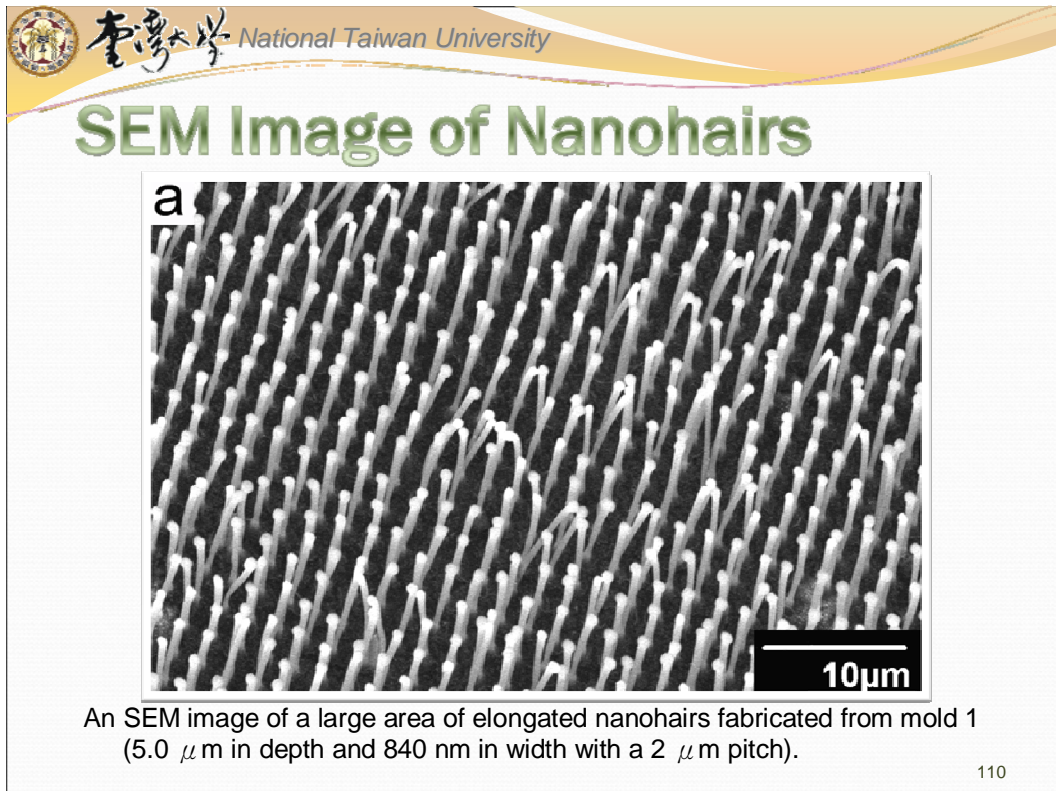
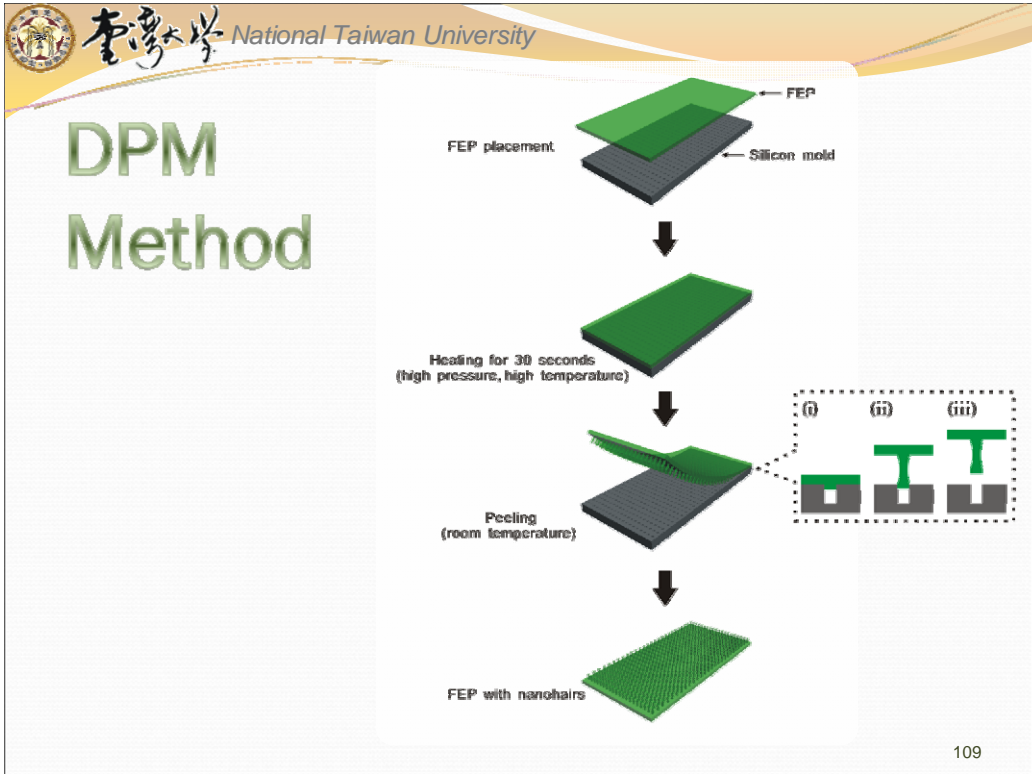
Introduction
Nanohair Structure

Cicada Wings

- The subwavelength anti-reflective feature on cicada wings is caused by hair-like structures

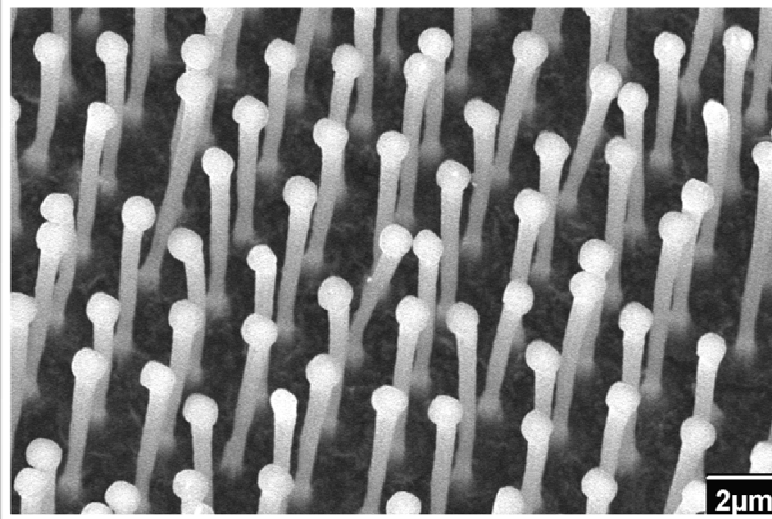


Guoyong Xie et al.
Nanotechnology 19 (2008) 095605⁸





SEM Image of Nanohairs

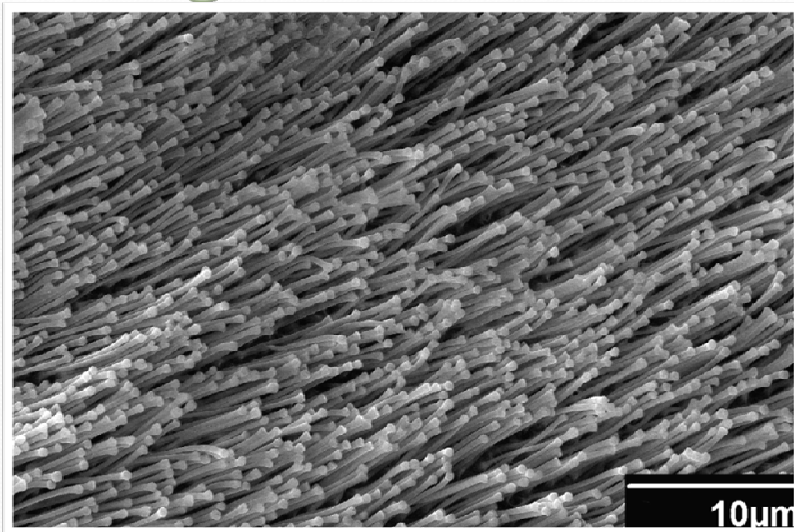


An SEM image of a large area of elongated nanohairs fabricated from mold 1 (5.0 μm in depth and 840 nm in width with a 2 μm pitch).

111



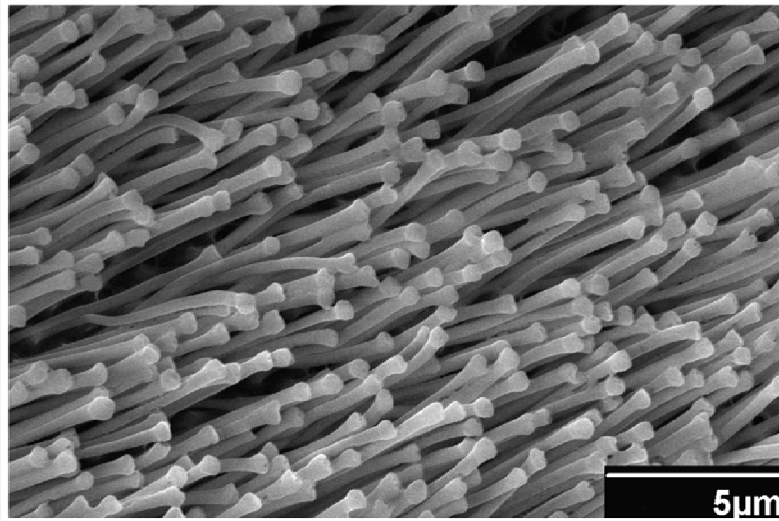
SEM Image of Nanohairs



An SEM image of a large area of elongated nanohairs fabricated from mold 2 (3.3 μm in depth and 640 nm in width with a 1 μm pitch).

112

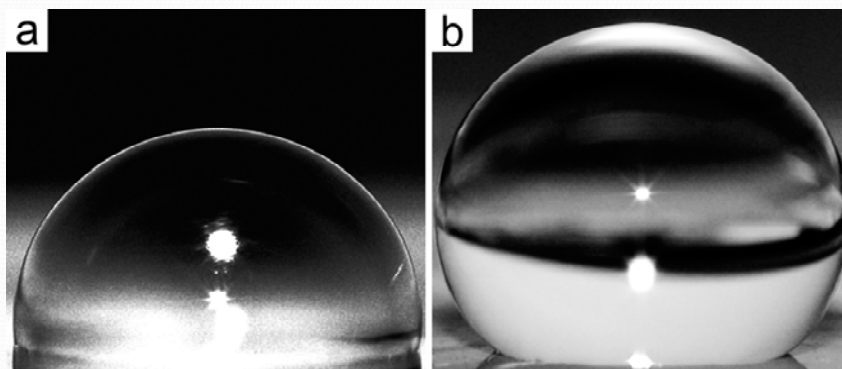
SEM Image of Nanohairs



An SEM image of a large area of elongated nanohairs fabricated from mold 2 (3.3 μm in depth and 640 nm in width with a 1 μm pitch).

113

Contact Angle Measurement



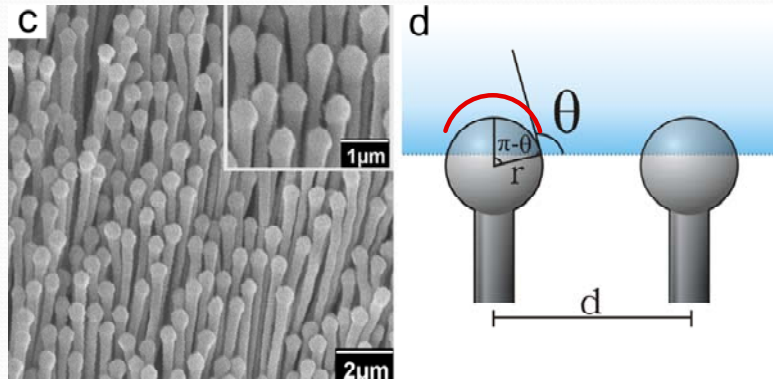
The digital camera image of a DI water dropped on the flat FEP. The contact angle here is about 108.0° , proving that FEP is highly hydrophobic itself.

The digital camera image of a DI water dropped on the FEP with Nanohair structures fabricated from mold 2. The maximum static apparent contact angle can reach 151.8° .

118



Assumption of f_1



$$f_1 = \frac{\int_0^{2\pi} \int_0^{\pi-\theta} r d\theta r \sin \theta d\phi}{d^2} = \frac{2\pi r^2 (1 + \cos \theta)}{d^2}$$