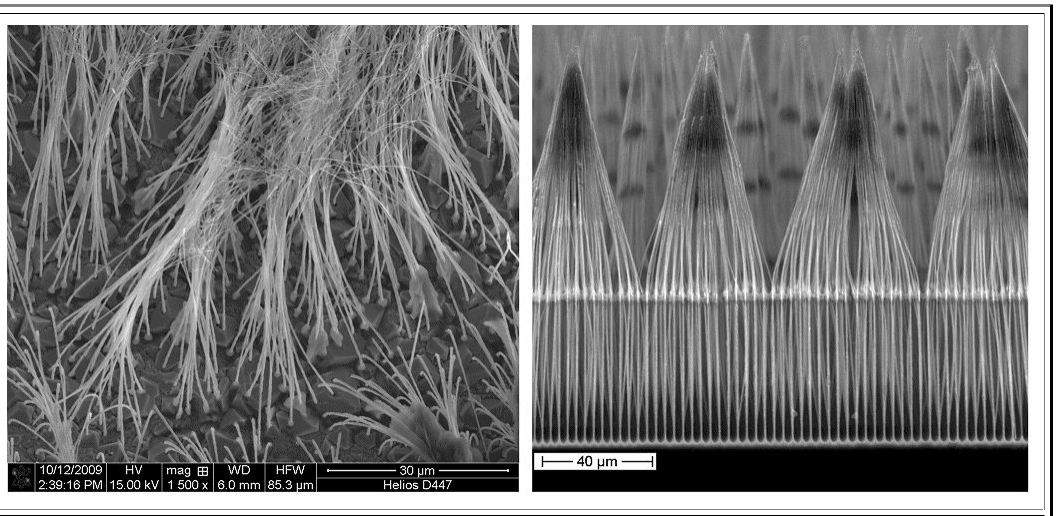
Stiction

Advanced

- We all know some kind of stiction that we also could call "wet hair effect".
  - The picture below shows what your hair looks like after it became wet. The surface tension of the liquid "glues" the hair fibers together.



Vertical and horizontal sticking of cantilevers

- The "hairs" here, however, are **Si** nanowires; far smaller than an actual hair. Their making involves some wet chemistry and at some point you pull the whole arrangement out of some liquid.
  - The **Si** nanowires stick together as shown - exactly like hair.
  - *However,* in contrast to hair, they do not come apart again as soon as they are dry. The "sticking forces" (properly called adhesion or secondary bonding) acting on the large specific surface cannot be overcome by the "spring forces" resulting from the elastic bending of the little volume of the nanowire.
  - Maybe Mother Nature saw to it that hairs are thin (the thinner the better for elasticity, thermal insulation, ...) but not too thin - just right for what they are being utilized for.