

KAJIHARA LAB.

Manufacture and measurement using surface and interface



Department of Mechanical and Biofunctional Systems

Manufacturing Science Fundamentals

Department of Precision Engineering, Graduate School of Engineering

http://www.snom.iis.u-tokyo.ac.jp/index_e.html

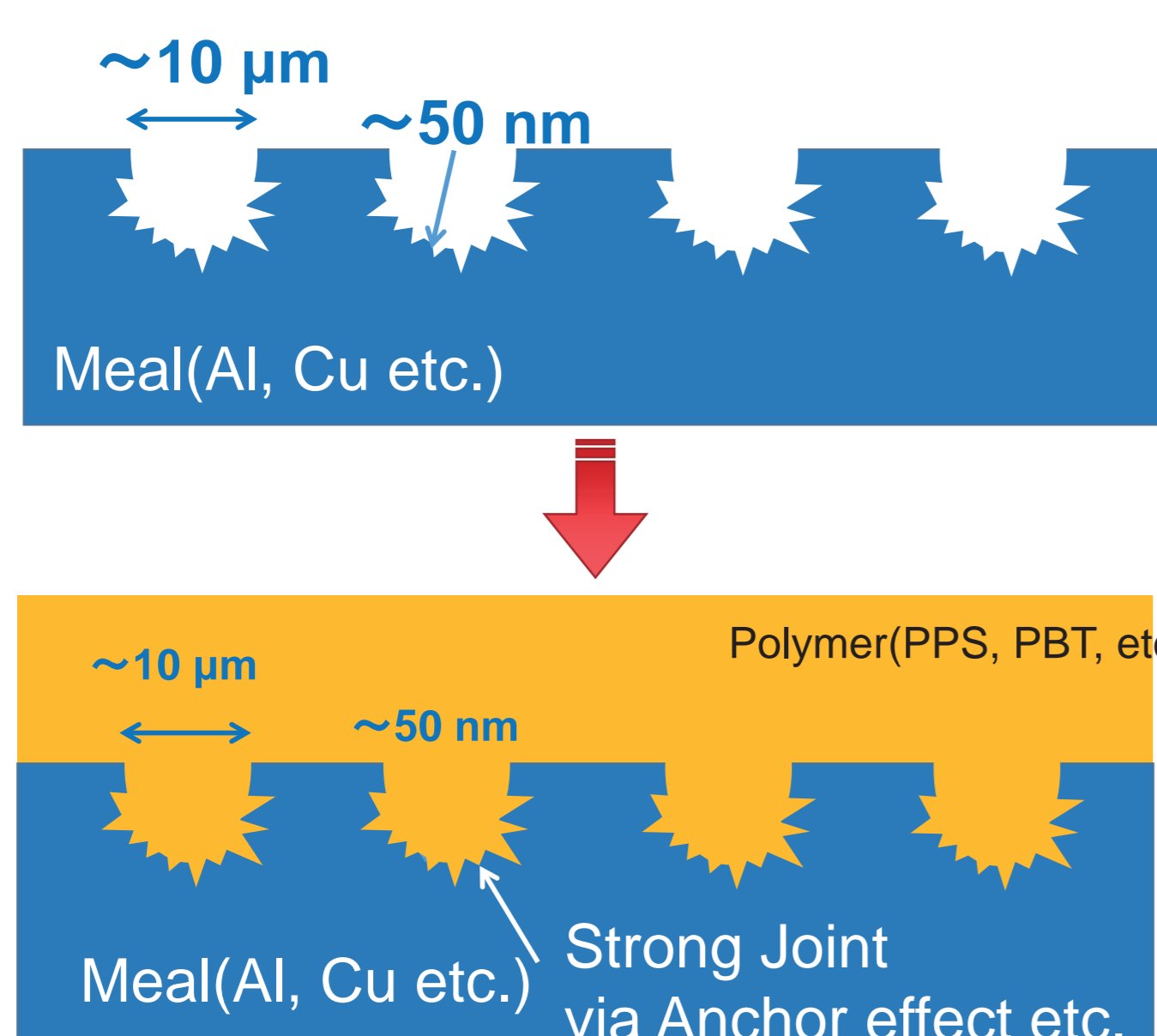
Manufacture and measurement using surface and interface

Metal-polymer direct joining

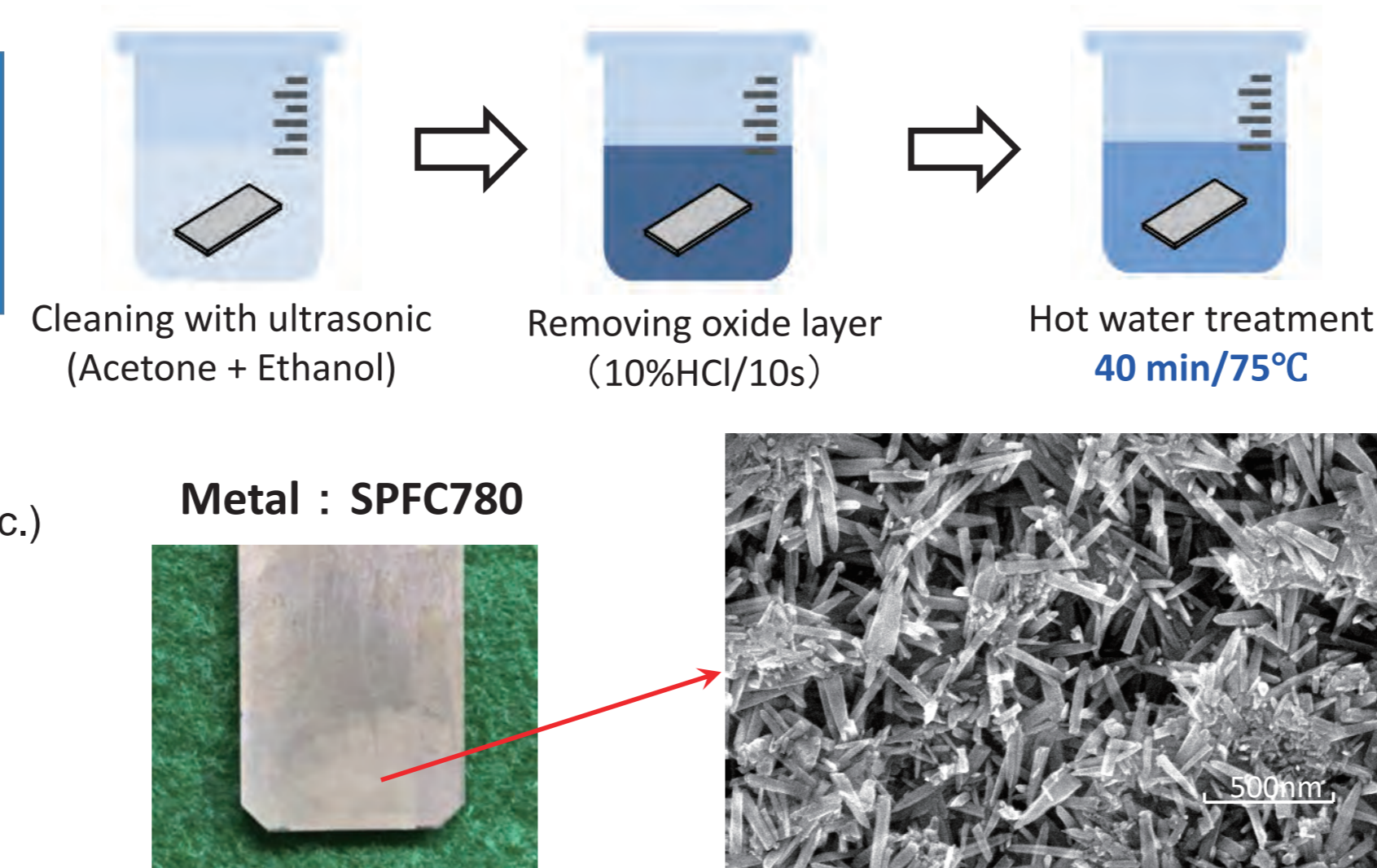
Micro/nanostructures on metal surfaces yield strong joints with plastics.

The effects of metal surface treatments and joining conditions, as well as the joining mechanisms, are analysed and clarified precisely to promote the development of industrial applications.

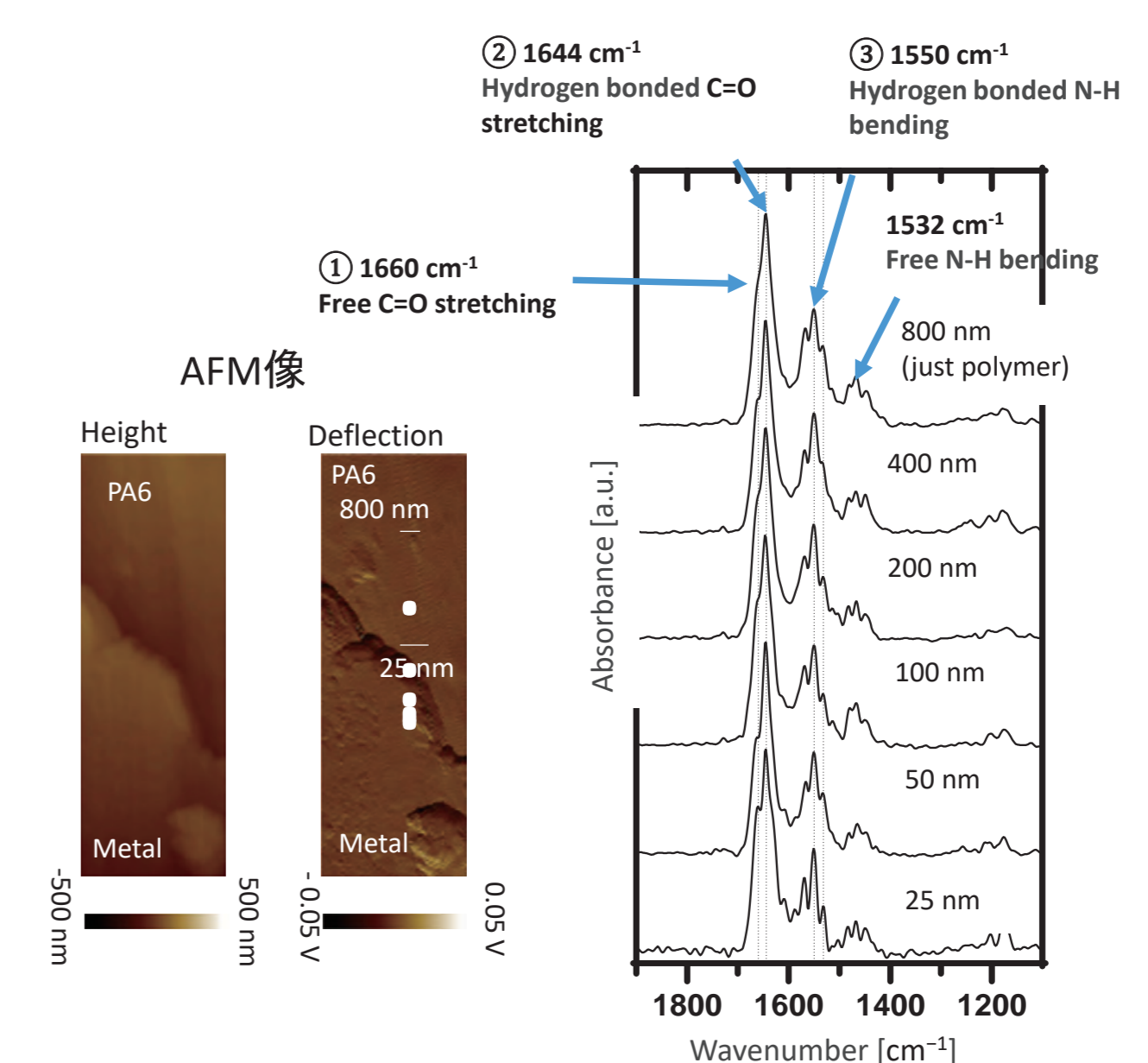
⇒ Car interiors and bodies, mobile phones, fuel cell encapsulation, semiconductor devices, etc.



Concept of direct joining



Nanoscale structures via hot water treatment

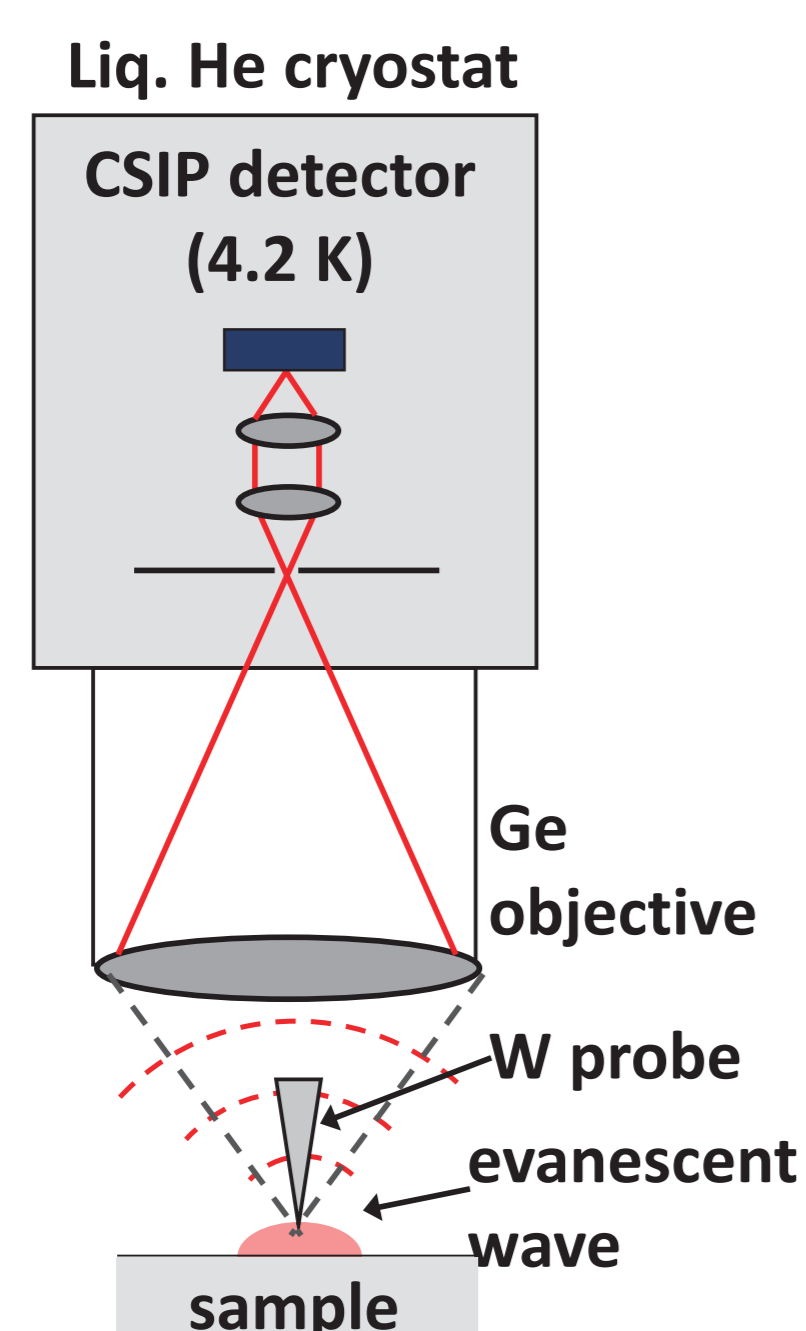


Hydrogen bonding analysis

Nanoscale heat detection

Unlike conventional microscopes, which observe optical responses by irradiating light, this system detects thermally excited evanescent waves (wavelength 10-20 μm) emitted by the material itself due to molecular vibrations or biological activity, passively and with nano-resolution.

⇒ Nanothermometry (lattice and electron temperature), energy dissipation on nano-ICs, etc.



Passive THz SNOM

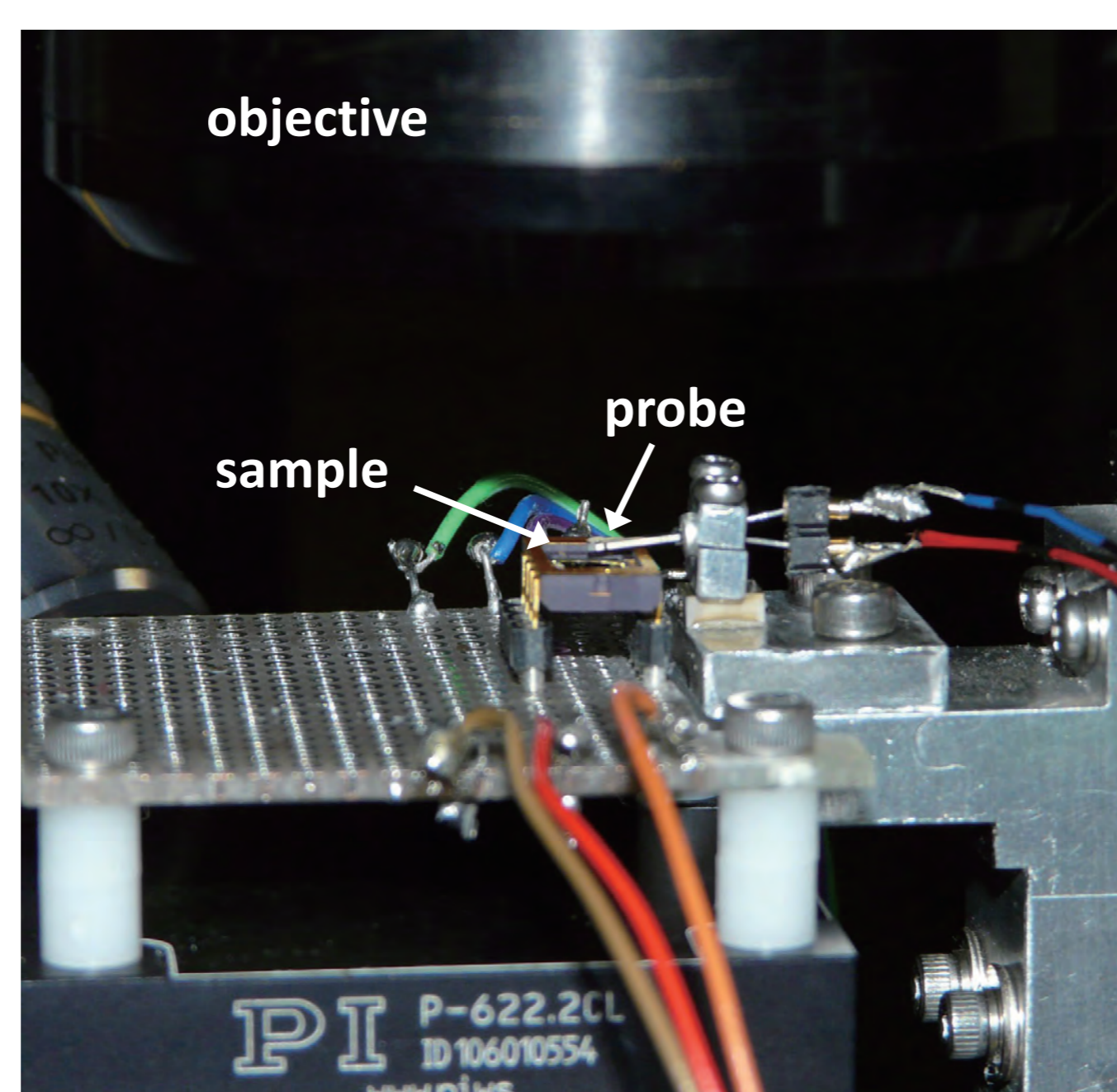
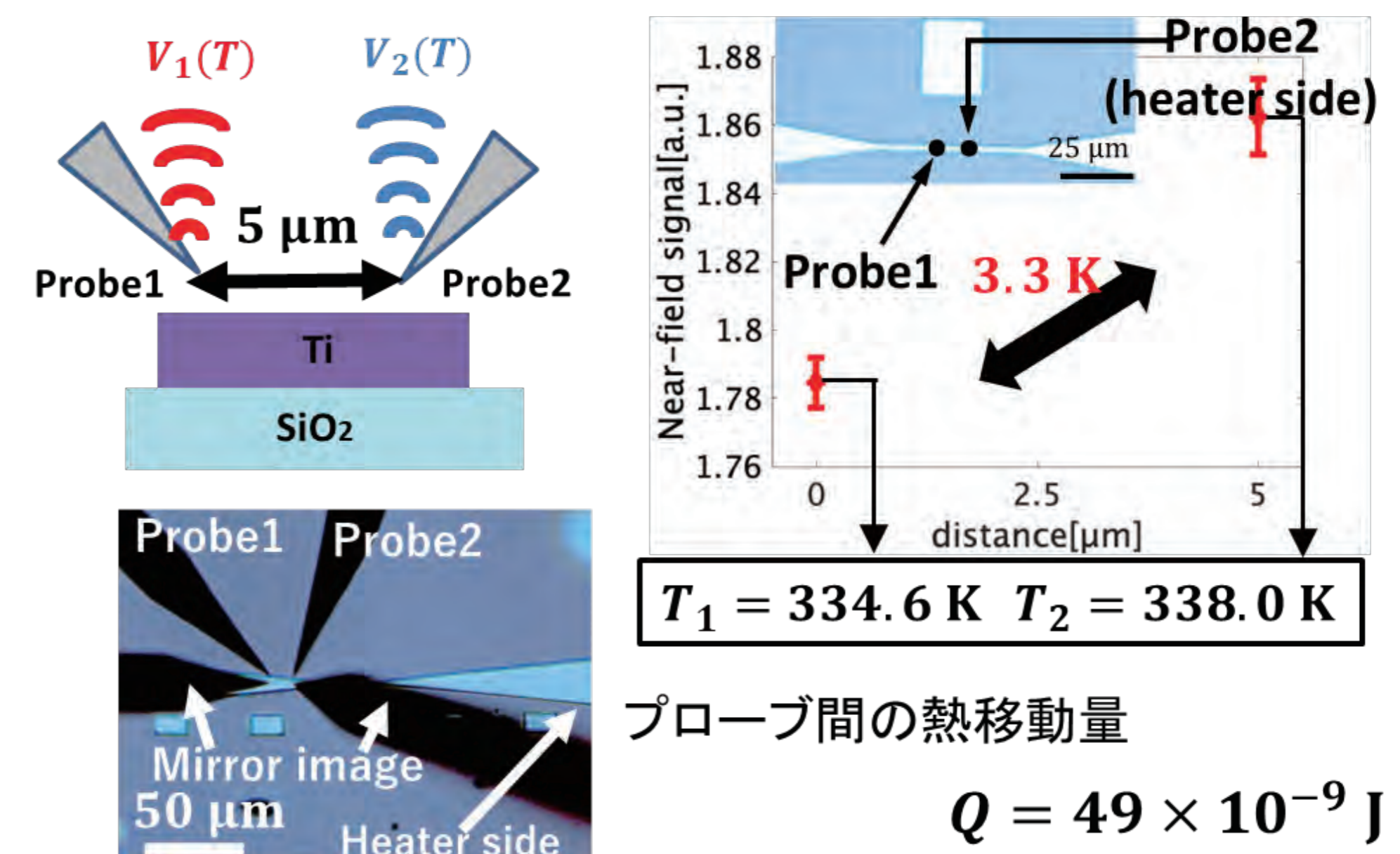


Photo around a sample



Observation of nanoscale heat transfer with two probes