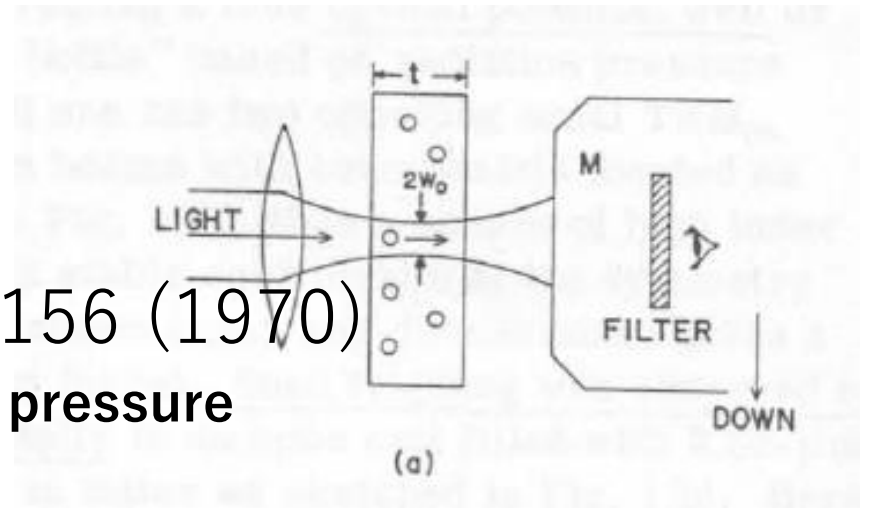


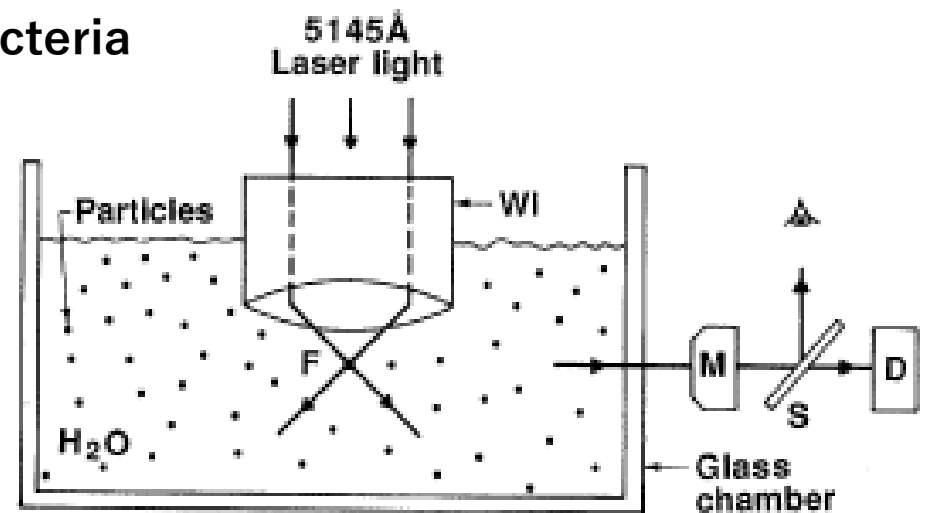
# 光ピンセットの歴史

- Arthur Ashkin, (Bell lab.) PRL., vol.24, p.156 (1970)  
**Acceleration and trapping of particles by radiation pressure**

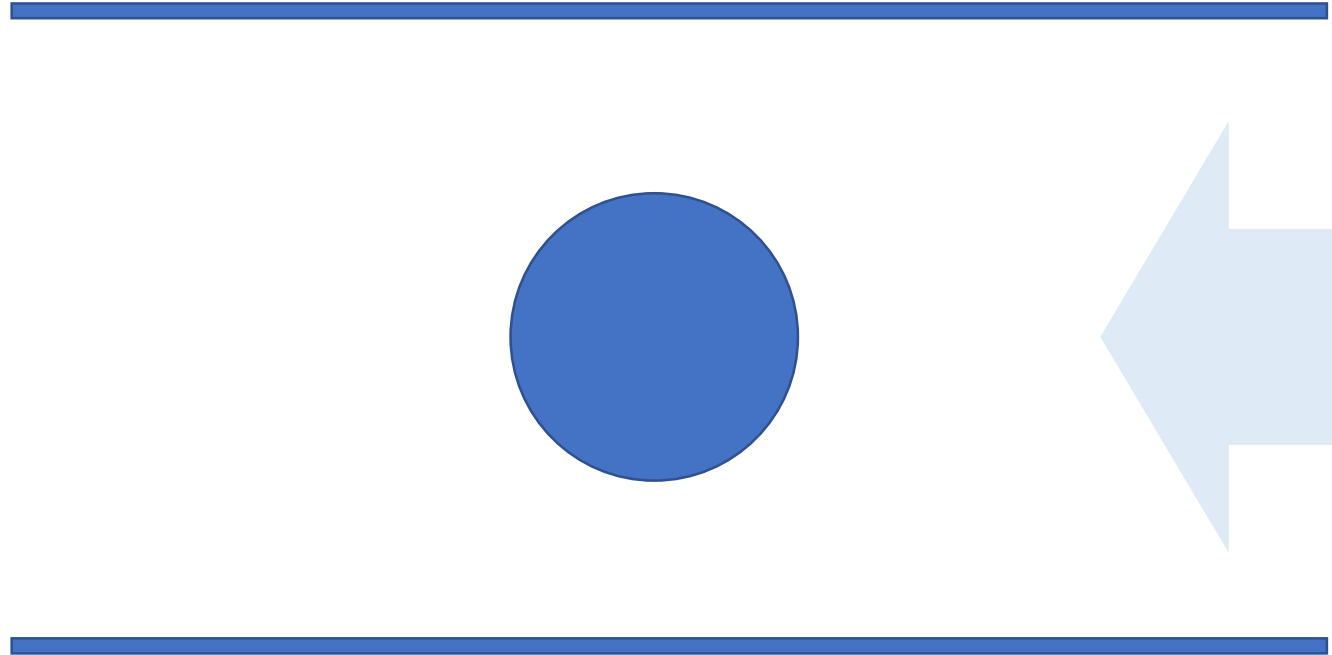


- Arthur Ashkin and J. M. Dziedzic, Science, Vol.235, p.1517 (1987)

**Optical trapping and manipulation of viruses and bacteria**



pN (ピコニュートンの力)



$$F = 6\pi\eta Rv$$

$$\eta = 1.0 \times 10^{-3} [\text{N} \cdot \text{s} \cdot \text{m}^2]$$

$$R = 1 \mu\text{m}$$

$$v = 100 \mu\text{m}/\text{s} = 10^{-4} [\text{m}/\text{s}]$$