Gravitational lensing plays an important role in the observational cosmology. After a brief introduction of gravitational lensing, I will give a talk on our weak lensing observation of Dark Matter (DM) sub-halos in nearby galaxy clusters using the Subaru telescope.

Weak lensing measurements of shear-selected subhalos enable us to study subhalo properties and correlation between subhalo masses and galaxy luminosities for the first time. The observed subhalo mass function provides a direct test of structure formation scenario based on cold dark matter.