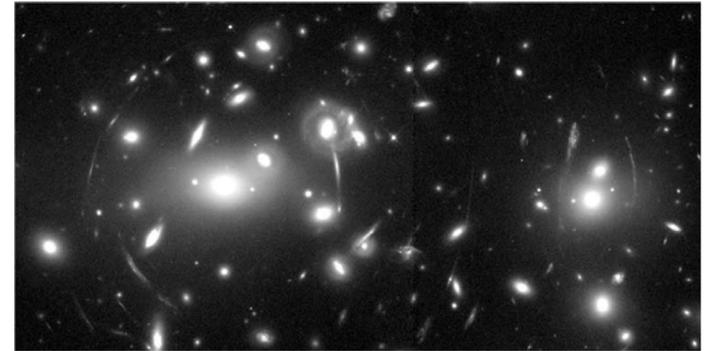


6. Suppose you wish to study the gravitational lensing of a distant quasar caused by a massive fore-ground galaxy. What kind of instruments would you need?

- instrument that can image large area deeply
 - large aperture telescope
 - CCD camera → wide field and deep survey
 - high sensitivity and quantum efficiency
 - stable measurement of brightness
 - drift scanning : electron can be moved at any desired rate
 - survey huge area to a deep level without moving the telescope
 - multi-object spectroscopic surveys
- ex) • HST's deep CCD exposure
- MACHO, EROS, and OGLE Telescopes with large-area CCD cameras
 - systematically survey particular regions of the sky → search gravitational lensing effects
 - SDSS
 - using 200,000 quasars and 13 million galaxies → revealed the gravitational lensing effect
 - Subaru/HSC



Abell 2218 by HST