



# CASTLES

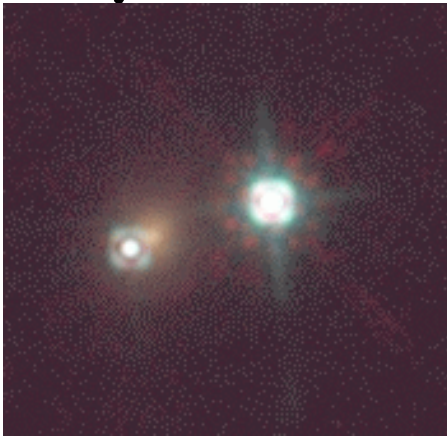
## CfA/Arizona HST Gravitational Lens Survey

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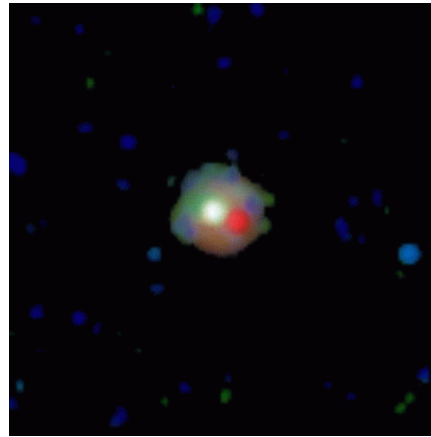


Six gravitational lenses observed by CASTLES, using the Hubble Space Telescope. In gravitational lensing, the light from a distant source is deflected by the gravitational field of a “lens” galaxy in the foreground. Light travels around the lens, forming multiple images of the source. The image positions and shapes depend on the lensing mass, so lenses can directly trace dark matter in galaxies. Lens galaxies are very distant, so they are also excellent probes of galaxy evolution and cosmology.

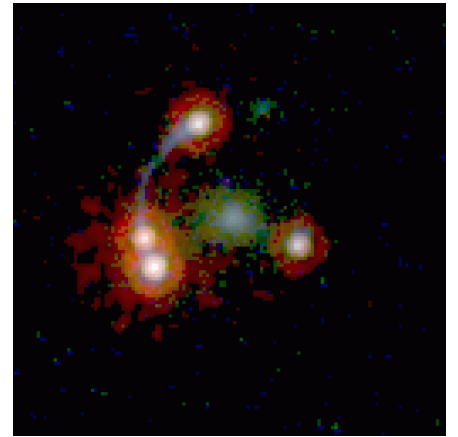
Q 0142–100



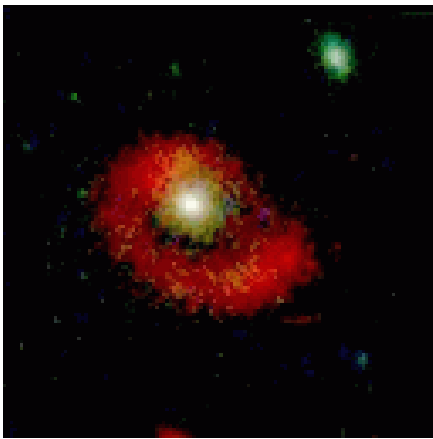
B 0218+357



MG 0414+0534



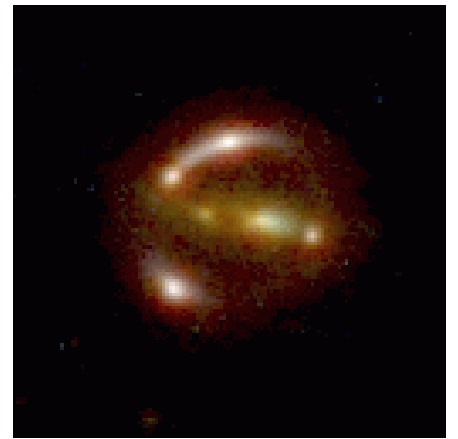
MG 1131+0456



B 1600+434



B 1608+656



Spherical lenses always produce two images of the source, but ellipsoidal lenses can produce four. For many lenses, the source is a galaxy’s compact “quasar” nucleus, but the images of an extended source can merge to form an “Einstein ring”. Q 0142–100 has two quasar images with the lens galaxy, shown as pinkish, close to the fainter image. In B 0218+357, one of the quasar images is severely reddened by dust in the lens. MG 0414+0534 has a lens, shown here in green, with four red quasar images, connected by a blue arc from the background galaxy. MG 1131+0456 is a very red galaxy which is distorted into a ring around the lens, shown as white. B 1600+434 has two lensed quasars to either side of an edge-on spiral galaxy lens, much like our own Galaxy. In B 1608+656, the source galaxy has four images of its nucleus, connected by arcs from its outer regions; and the lens, shown as yellow, has two components. These false-color pictures are from optical and near-infrared observations.