Abell 2218 Galaxy Cluster

William Herschel Telescope + ING Red Imaging Device (INGRID)

Images from INGRID reveal the central regions of the massive cluster of galaxies, Abell 2218, at a distance of approximately 2 thousand million light years from Earth. Several arc like features are clearly visible around the brightest galaxies at the cluster center. These represent the distorted and gravitationally magnified images of very distant galaxies behind the cluster. The huge concentration of dark matter in the core of the cluster acts as a gravitational lens, bending the paths of light rays from the background galaxies and in the process magnifying their images, in accordance with Einstein's Theory of Relativity. This image is used to study the properties of a rare class galaxies which are bright at near-infrared wavelengths but invisible in the optical, and a possibly related family of very luminous galaxies which emit most of their energy in infrared light. By exploiting the magnification by the cluster lens, astronomers can investigate the properties of these faint galaxies in much greater detail than would otherwise be possible.

Credit: Ian Smail (University of Durham), Chris Packham (ING).

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