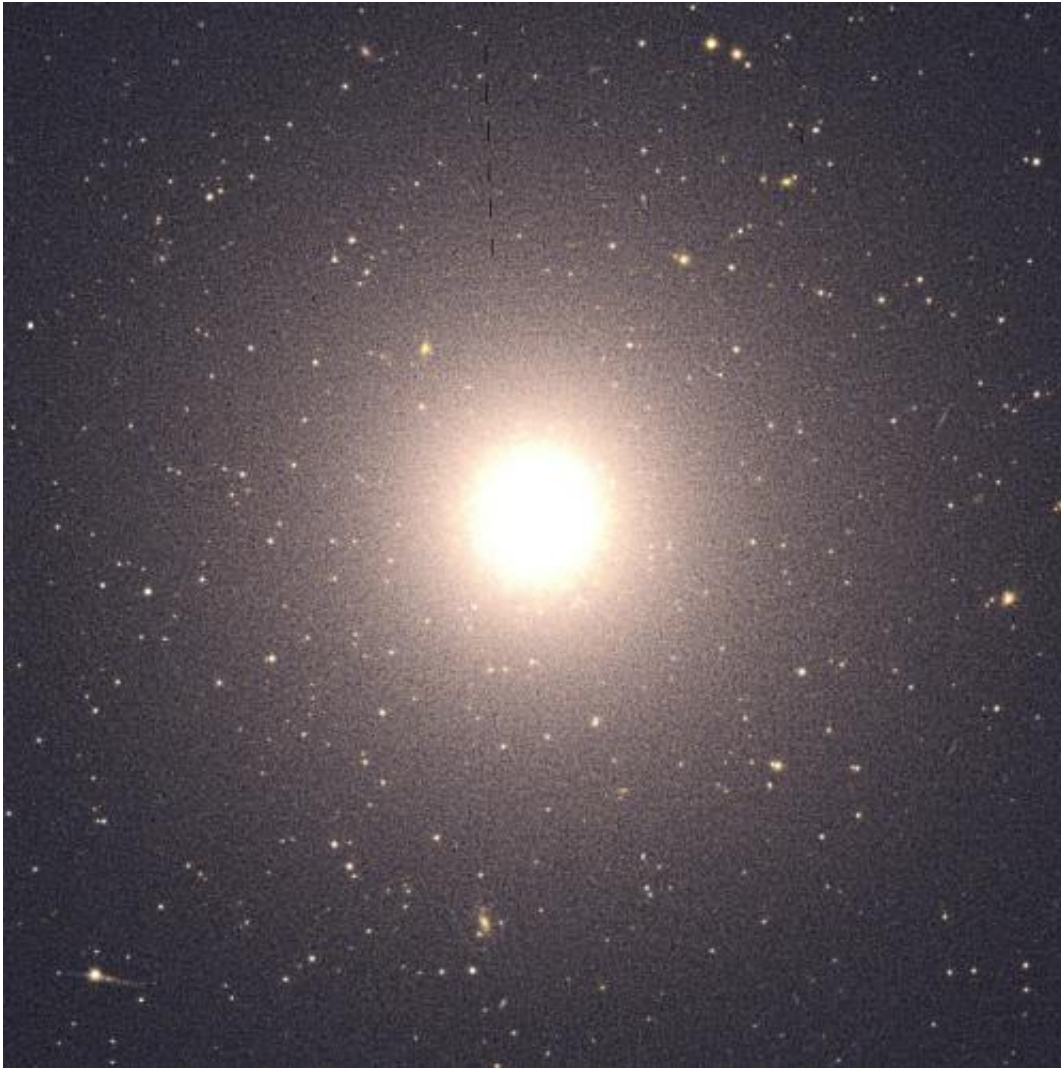


Building galaxies

July 11 2011



An optical image of the giant elliptical galaxy NGC 1407 and the large population of globular clusters (small starlike objects) scattered around it. New studies of these globular clusters confirm the theory that the outer regions of this galaxy are younger, and probably the result of interactions with neighboring galaxies. Credit: Hubble Space Telescope

(PhysOrg.com) -- Galaxies frequently collide with one another. Our own Milky Way galaxy, for example, and its nearest giant neighbor, the Andromeda galaxy, are heading towards each other at a rate of about 120 kilometers per second; predictions claim the two will merge together in another four billion years or so.

It is not only the future of our home galaxy that interests scientists. These powerful interactions are thought to help produce stars, feed the massive [black holes](#) that sit at the cores of galaxies, and in general influence in fundamental ways the development and evolution of galaxies.

According to theory, the later stages of a galaxy's growth are the ones dominated by sporadic collisions; in the earlier stages a galaxy steadily accumulates material from its surroundings. These early phases should dominate the nature of stars in the older, inner regions of a galaxy, whereas interactions dominate the stars in the outer regions. The two sets of stars are demonstrably different, distinguished by the relative abundances of their elements in the sense that heavier elements signal older, evolved stars.

A galaxy's [globular clusters](#) can provide a measure of a galaxy's element abundances, and how they vary. A globular cluster is a roughly spherical ensemble of stars (as many as several million) that are gravitationally bound together and typically located in the outer regions of [galaxies](#). CfA astronomer Jay Strader, together with five colleagues, has examined the family of about 2600 globular clusters around the giant elliptical galaxy NGC1407, which is interacting with its neighbor, NGC1400.

The team reports finding a strong variation in the elemental abundances of the globular clusters, with those closer to the galaxy having more heavier elements. The evidence provides strong confirmation of the overall model in which the inner regions formed earlier, by steady

accumulation, whereas the more distant, outer regions, which were involved in more recent interactions, are younger.

Provided by Harvard-Smithsonian Center for Astrophysics

Citation: Building galaxies (2011, July 11) retrieved 25 March 2023 from <https://phys.org/news/2011-07-galaxies.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.