

# Discovery refutes previous theory about galaxies

October 11 2011, by Javier Pérez Barbuzano

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(PhysOrg.com) -- The world's largest optical telescope has allowed University of Florida astronomers to see new details about deep space galaxies, finding new clues to explain the evolution of galaxies like our own.

Before these new observations, it was believed that [galaxies](#) in the young universe were much denser and compact than they are now, undergoing at some point a mysterious transformation growing in size and mass. Astronomers around the world struggled to find an explanation.

Now, a UF-led team has used the Gran Telescopio Canarias, or GTC, to point out the solution to the mystery: The data gathered by lesser telescopes was not accurate enough, which led to misinterpretation.

The GTC in Spain's Canary Islands has a primary mirror of 10.4 meters, or 27.6 feet, which allowed the team led by UF graduate student Jesus Martinez and professor Rafael Guzman, to observe four of these dense galaxies with a level of detail unachieved so far. They found that the four were six times less massive, on average, than previously believed, as described in the September issue of *The Astrophysical Journal Letters*.

It takes time for light to travel through the universe. Considering the great distances the light must travel to get to Earth, looking through larger telescopes means not only being able to see farther in distance, but also back in time — in this case 9 billion years ago.

Martinez and teammates from Spanish research centers Instituto de Astrofísica de Canarias and Universidad Complutense de Madrid, concluded that what had been thought of as super-dense galaxies actually were not so dense and had not undergone dramatic transformation — a discovery that shows how scientists must always question previously accepted principles.

Cutting-edge scientific tools such as the GTC help bolster this kind of healthy scepticism.

UF is a 5 percent partner in the \$180 million GTC, which was inaugurated in 2009.

Provided by University of Florida

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