

4 June 2008

By: Gabriel Gache, Science News Editor



Image of a system of interacting galaxies
NASA/ESA/Hubble
Space Telescope

[Star Formation Conditions in Collision Debris Identical to Those Inside Galaxies](#)

Colliding galaxies present astronomers with star formation laboratories

Why study the star formation process in individual galaxies when the debris left behind by colliding galaxies makes matters so much simpler? In a press conference at the American Astronomical Society, Mederic Boquien from the University of Massachusetts showed that the study of the star formation process is much more accessible in case of galactic collisions than in regular non-interacting galaxies. "Surprisingly, we found that star formation is essentially the same in galaxies and in the debris which occurs between galaxies, in spite of tremendous differences in the environment. This is a very exciting result, meaning that we can use these regions, which are located outside a pre-existing stellar disk and are much simpler than star forming regions in galaxies, to study the creation of stars", says Boquien. When galaxies collide with each other, the gravitational forces created by the interacting objects strip matter off of them to form long tidal tails that are ejected into intergalactic space. The material is mostly gas and dust, can weigh as much as several billion times more than the Sun and will later collapse under its own weight to massive stars and tidal dwarf galaxies, held together by their own gravitational field. In the last five decades or so, galaxy collision debris was mostly studied in order to learn about the nature of dark matter, since it wasn't known yet whether the conditions in such collisions were identical to those inside the galaxy and whether the information regarding the star formation inside them can be correlated to that on young stars forming in galaxies. Nevertheless, by studying six interacting galaxy systems at distances between 55 and 375 million light years away from Earth where up to 85 percent of the star formation processes take place in the collision debris, the team was able to establish that the conditions leading to the formation of stars in intergalactic medium and inside galaxies are nearly identical. "The best regions to study stellar evolution would be those completely devoid of old stars, and we were able to find some regions which satisfy these criteria. As star formation apparently occurs in a similar way in galaxies, results we obtain studying intergalactic star forming regions can be confidently extended to galaxies", says Boquien. Additionally, he said that intergalactic star forming regions are generally isolated, while areas inside galaxies are surrounded with a multitude of bright objects.