Home | About SpaceRef NASA Watch OnOrbit Commercial Space SpaceRef Canada



MISSIONS INTERNATIONAL SPACE STATION CALENDAR NEWS ARCHIVES SPACE WEATHER SPACE DIRECTORY

MERCURY VENUS EARTH MOON MARS JUPITER SATURN PLUTO ASTEROIDS & COMETS

## Dwarf Galaxy Questions Current Galaxy Formation Models

Source: Centro de Astrofisica da Universidade do Porto Posted Monday, February 27, 2012



CAUP Astronomer Polychronis Papaderos, along with his colleague Goeran Oestlin (Oskar Klein Center, U. Stockholm), used the Hubble Space Telescope (HST) to get extremely accurate observations of the I Zw 18 galaxy. Their research led to the conclusion that this enigmatic blue compact dwarf might force astronomers to review current galaxy formation models.

I Zw 18 is one of the most studied dwarf galaxies, because among those that have strong star forming activity, it's one of the poorest in heavy elements. Besides, its proximity to the Earth, combined with a total exposure time of nearly 3 days, gave the researchers data with unprecedented resolution and sensitivity.

Analysis of these data revealed an extended gas halo surrounding this galaxy, 16 times larger than the star component of the galaxy, and without any stars. This halo is the result of huge amounts of energy generated by the starburst this galaxy is going through. This energy heats and disturbs I Zw 18's cold gas, which ends up emitting an amount of light comparable to what's being emitted by the stellar component. This emission is designated nebular emission.

Papaderos, a Greek astronomer working in Portugal, comments that: "This is ground-breaking work because it provides the first observational proof that, in the early Universe, young galaxies that underwent starbursts must have been surrounded by a huge halo of nebular emission. This extended nebular halo results from the cumulative energetic output from thousands of massive stars exploding as supernovae, shortly after their formation."

So far, in distant galaxies where it's not possible to reach resolutions high enough in order to distinguish between nebular and star emission, it was assumed that the gas occupied the

## RECENT PRESS RELEASES

Spaceport Chief Seeks Help to Keep Industry in California

NASA Scales SGI Pleiades InfiniBand Cluster to 25,000 IntelXeon Processor Cores

NASTAR Center Announces New Space Training Courses & Public Experience Programs

MSU satellite surpasses goal; NASA taps MSU to queue up for another launch

SwRI and XCOR agree to pioneering research test flight missions

## CALENDAR

Events Launches Your Event

28 Feb: 4th Annual NASA STEM Educators
Workshop Series

28 Feb: CASIS RFI Webinar Presentation and

Q&A Session

28 Feb: NASA Co-hosts Minority Males in STEM

28 Feb: NASA Brings Excitement of STEM

Education To Teachers in Charlotte, NC

28 Feb: NASA JSC Multi-Purpose Crew Vehicle

Program Integration Contract Virtual Industry
Day

29 Feb: Media Invited to NASA Glenn to See New Fuel Cell Demonstration on Mobile Rover

29 Feb: Hearing: NASA Cybersecurity: An Examination of the Agency's Information Security

29 Feb: NASA Education Day at CIAA Brings Motivational Speaker, NASCAR Driver

29 Feb: NLSI Directors Seminar Series: Robert MacDowall, NASA/GSFC

29 Feb: House Subcommittee on Investigations and Oversight Hearing: NASA Cybersecurity

1 Mar: NASA Astronauts Bring Wonder of Space Station to Bay Area

\* Submit Your Event | More Events \*

SUBSCRIBE

MASTHEAD

RSS Feed

Tip your editors tips@spaceref.com

Twitter
UStream

Editor-in-Chief: Keith Cowing Email | Twitter

W YouTube

Chief Architect:
Marc Boucher

Vimeo

Newsletter

Email | Twitter

1 of 3 28-02-2012 17:44

same region as the stars and stars were responsible for emitting most of the light.

This study showed that galaxies undergoing starbursts, similar to I Zw 18, might not obey this rule. This result might lead to substantial corrections in a lot of the work being developed in cosmology and extragalactic astronomy. An example is the estimate of star mass in a galaxy, which is calculated from the galaxy's total luminosity. But, as these results shows, up to 50% of that luminosity might originate in nebular, and not star, emission.

Another result from this research shows that, according to Papaderos, "the distribution of nebular emission might be misinterpreted as a stellar disk. These galaxies, still in early stages of formation, might thus be wrongly classified as fully formed galaxies" (such as spirals or ellipticals), a classification mistake that might have happened in many past studies to determine galaxy evolution in the early Universe.

These results are also of importance for our understanding of galaxy formation, because the team concluded that I Zw 18 is extremely young, with most stars younger than 1 billion years. So this galaxy is currently undergoing the dominant phase of its formation, much like the ones formed shortly after the Big Bang.

Media Contacts:

Ricardo Reis / Pedro Mondim +351 22 608 98 36 / +351 22 608 98 35 ricardo.reis@astro.up.pt / pedro.mondim@astro.up.pt

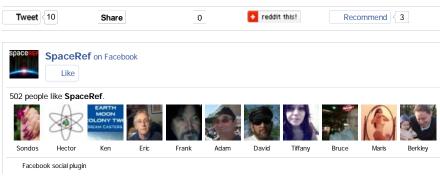
Science Contact: Polychronis Papaderos +351 22 608 98 39 papaderos@astro.up.pt

The article "I Zw 18 as morphological paradigm for rapidly assembling high-z galaxies" by Papaderos et al. was published in Astronomy & Astrophysics:

http://dx.doi.org/10.1051/0004-6361/201117551

The Centro de Astrofisica da Universidade do Porto (CAUP, http://www.astro.up.pt) is a private, non-profit, scientific and technical association, recognized as of public utility. It is the largest astronomy research institute in Portugal and since 2000, it has been evaluated as Excellent by international panels, organized under the auspices of the national science foundation (FCT). Among its statutory objectives is the support and promotion of Astronomy, through research, education at the graduate and undergraduate levels, science outreach and popularization of astronomy. The long-term research strategy of CAUP is the assembly of strong research teams on origin and evolution of stars and planets and galaxies and observational cosmology.

Please follow SpaceRef on Twitter and Like us on Facebook.



Like

## Add New Comment

Login

Type your comment here.

Real-time updating is paused. (Resume)

Trade Forex like a Pro

The biggest guide to the best online casino bonus codes you can find on the net.

http://www.spaceref.com/news/viewpr.html?pid=36229

Bingo stir with jj, fresh bingo sites for your bingo lovers.

the best online casinos guide on the internet offering higher payouts than any land based casino.

- bingo Canada
- Dieses Portal stellt Ihnen die besten online Casino Bonus und Pokerräume im Internet vor.
- Always play bingo with recommended sites.
- 220Marketing specializes in providing mortgage marketing for mortgage companies and managers.
- bingo
- Webmaster? Enroll to the leading forex affiliates program.

2 of 3 28-02-2012 17:44