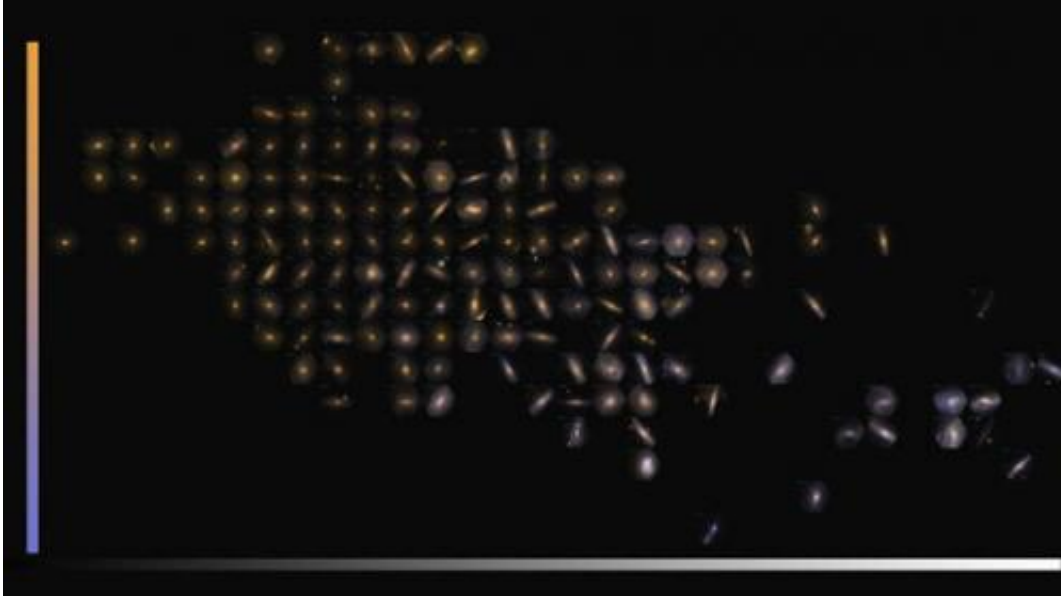


# Survey unveils the history of galaxies

November 29 2012

---



(Phys.org)—A revolutionary survey of nearby galaxies will allow scientists to map their different properties – opening the way for new understanding of the origins of life and the growth of the Milky Way.

An international team of astronomers, including academics at the University of St Andrews, have released maps of 100 galaxies from the Calar Alto Legacy Integral Field Area Survey (CALIFA survey).

These will allow scientists to study how fast they are rotating, the age of their stars and the [chemical composition](#) of their gas. The data has also

allowed stunning 3-D images of 100 galaxies to be created for the first time.

This information will yield new understanding of the structure and history of galaxies in the Universe.

For example, it will improve understanding of the [physical processes](#) that were important in turning galaxies from disordered balls of gas in early times into the grand structures around us today, and it will help us build a picture of how the [chemical elements](#) needed for life were created inside galaxies.

The Calar Alto Observatory is jointly operated by the Max Planck Institute for Astronomy (MPIA-MPG, Heidelberg, Germany) and the Astrophysical Institute of Andalusia (IAA-CSIC, Granada, Spain).

This enormous project has required the combined effort of a large consortium of astronomers including 80 scientists and engineers from 13 nations spread among 25 research institutes.

The research being carried out at the University of St Andrews, led by Dr Vivienne Wild and funded by a European Research Council grant, is focused on what happens when galaxies get too close, and collide with one another.

Dr Wild, Lecturer in the School of Physics and Astronomy at the University of St Andrews, and board member of the CALIFA survey, said: "The CALIFA dataset is going to be a spectacular resource for astronomers over the coming years, helping us to answer some of the biggest questions we have about why the Universe looks the way it does.

"And the technology and techniques developed by the mostly European CALIFA consortium are already leading the way for the next generation

of IFS (Integral Field Spectroscopy) surveys being designed in Australia and the United States."

Galaxies are the final products of the Universe, which has been evolving over the last 13 billion years; from the Big Bang into the galaxies, stars and planets that we see around us today.

The evolutionary history of galaxies is encoded in their observable properties, a bit like human evolution is encoded in our genes.

The CALIFA survey is using a special technique called Integral Field Spectroscopy (IFS) to decode this information and help us learn about how galaxies like our own Milky Way became such huge conglomerations of billions of stars.

The CALIFA survey is an ongoing international project, including researchers at the University of St Andrews, which is using a telescope at the Calar Alto Observatory in Spain to observe the galaxies.

Traditional techniques to observe and quantify the properties of [galaxies](#) involve either imaging, which gives detailed information about their shapes, or spectroscopy, which gives detailed information about their chemical compositions.

The recent development of IFS technology allows astronomers to combine these two techniques, to collect simultaneously hundreds of spectra at many points on each galaxy, thanks to some cleverly designed optics. CALIFA is the first IFS "legacy" project that will release all of its data to the public. Upon completion, it will be the largest survey of this kind ever accomplished.

Sebastián Sánchez, from the Astrophysical Institute of Andalusia in Spain, and Principal Investigator of CALIFA said: "I am tremendously

happy to see a dream come true.

"When we first thought of CALIFA, five years ago, the prospective of releasing such wonderful data seemed far off, yet it is happening right now.

"We hope and expect that the scientific community will make use of the opportunity."

**More information:** [califa.caha.es/DR1](http://califa.caha.es/DR1)

Provided by University of St Andrews

Citation: Survey unveils the history of galaxies (2012, November 29) retrieved 10 July 2024 from <https://phys.org/news/2012-11-survey-unveils-history-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.