

COVER ILLUSTRATION: ARP 147

Arp 147 appears in the Arp Atlas of Peculiar Galaxies, compiled by Halton Arp in the 1960s and published in 1966. Arp 147 lies in the constellation Cetus, and it is more than 400 million light-years away from Earth. The two galaxies happen to be oriented so that they appear to mark the number 10. The left-most galaxy, or the “one” in this image, is relatively undisturbed apart from a smooth ring of starlight. It appears nearly on edge to our line of sight. The right-most galaxy, resembling a zero, exhibits a clumpy, blue ring of intense star formation. The blue ring was most probably formed after the galaxy on the left passed through the galaxy on the right. Just as a pebble thrown into a pond creates an outwardly moving circular wave, a propagating density wave was generated at the point of impact and spread outward. As this density wave collided with material in the target galaxy that was moving inward due to the gravitational pull of the two galaxies, shocks and dense gas were produced, stimulating star formation. The dusty reddish knot at the lower left of the blue ring probably marks the location of the original nucleus of the galaxy that was hit. The galaxy pair was photographed on October 27–28, 2008, to test the performance of the WFPC2 after being brought back on line a few days before. This picture was assembled from WFPC2 images taken with three separate filters. The blue, visible-light, and infrared filters are represented by the colors blue, green, and red, respectively. The image demonstrated that the camera was working exactly as it was before going offline, thereby scoring a “perfect 10” both for performance and beauty. (Image and legend credit: NASA, ESA, and The Hubble Heritage Team: STScI/AURA).

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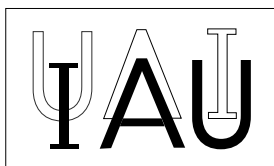
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INTERNATIONAL ASTRONOMICAL UNION
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STELLAR POPULATIONS – PLANNING FOR THE NEXT DECADE

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Preface

IAU Symposium 262, “Stellar Populations: Planning for the Next Decade,” took place in Rio de Janeiro, Brazil, on August 3-7, 2009, during the XXVIIth General Assembly of the IAU.

The Symposium provided a stimulating environment for the presentation and discussion of the newest results in the various fields of study usually covered in stellar population meetings. Important progress was reported on the modeling of thermally pulsing asymptotic giant branch stars and on the implication of this progress for the interpretation of observed stellar populations. Also, models of stellar populations with non scaled-solar metal abundance ratios (e.g. α -enhanced mixtures) have improved dramatically, enabling new types of spectral studies of galaxies at high resolution. On the observational front, studies of resolved stellar populations in the Milky Way and nearby galaxies, using both imaging and spectroscopy, have reached a high level of sophistication, allowing in some cases the reconstruction of the star formation and chemical enrichment histories in these systems with considerable detail. At the same time, extremely deep infrared spectra of very high redshift galaxies have provided access to the rest-frame optical spectra of these systems, constraining their stellar populations. The availability of large databases of observations and theoretical models, which can be queried and cross-linked, has motivated the development of flexible tools to study stellar populations at all redshifts, which are providing important new constraints for models of galaxy formation and evolution.

This Symposium was also the opportunity to identify some main challenges in stellar population studies for the next decade. A primary challenge for modelers will be to develop well-calibrated and extensively tested models over the whole spectral range from ultraviolet and infrared wavelength, and their associated errors. This requires modeling the late phases of stellar evolution to nearly the same degree of accuracy as is achieved today for main sequence stars. Progress must also be accomplished in models of stellar populations with non-solar abundance to offer more stringent constraints on galaxy assembly from chemical pattern studies. Observationally, the new ground-based and space-based facilities planned for the next decade should enable studies of resolved stellar populations with unprecedented detail in the nearby universe and, at the same time, offer images and spectra of the very first stellar populations to have formed in the distant universe.

The help of the SOC was instrumental in selecting the key-note and invited speakers, who, together with a participative audience, made a magnificent job to bring this Symposium to its success.

We warmly thank the National and Local Organizing Committees, who provided outstanding meeting conditions, making sure that all was running smoothly.

Gustavo Bruzual A. and Stéphane Charlot
co-Chairs of the Scientific Organizing Committee

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Stellar Populations: Planning for the Next Decade

IAU SYMPOSIUM 262

Rio de Janeiro, Brazil, August 3-7, 2009

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Session Topics:

The physics of stellar populations
Spectral evolution models
Stellar populations in the Milky Way
and in local resolved galaxies
Stellar populations in Early and Late-type galaxies
What have we learned from the interpretation of
large spectral surveys?
Models and simulations of galaxy formation
The next decade



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