
Young, Massive Stars and Black Holes in the Low-Metallicity Galaxy, I Zw 18

Sara R. Heap^{*1}, Jean-Claude Bouret², Ivan Hubeny³, and Thierry Lanz⁴

¹Emerita Scientist, NASA/GSFC – Greenbelt - United States

²Laboratoire d'Astrophysique de Marseille (LAM) – Université Aix-Marseille, CNRS, France

³Steward Observatory, University of Arizona - Tucson, United States

⁴Observatoire de la Cote d'Azur– Nice, France

Abstract

I Zw 18 is a local star-forming dwarf galaxy having a very low metal content, $O/H \sim 1/50$ solar. While galaxies with such low metallicity are rare in the low-redshift universe, they are likely to be common in galaxies at cosmic dawn. Thus, the spectrum of I Zw 18 is a "living" template for $z > 6$ galaxies. The goal now is to build theoretical models that reproduce its observed spectrum. Such models can then be used as starting points to explore the physical conditions in which stars and black holes form and evolve in an extremely low-metallicity environment.

We have obtained HST/COS far-UV spectra of the massive northwest star cluster in I Zw 18 and have compared them to SYNSPEC model spectra by Lanz & Hubeny (2003, 2007) in order to determine the properties of the stellar population and to understand its feedback in the form of photoionization and stellar winds. We have also compared the observed spectra of I Zw 18-NW to the CLOUDSPEC models of Hubeny, Heap, and Lanz (2000) of the stellar population with an embedded ultra luminous X-ray source (ULX) in order to estimate the feedback of the stellar black hole in the form of photoionization and heating.

*Speaker