Instituto de Astronomía, sede Ensenada
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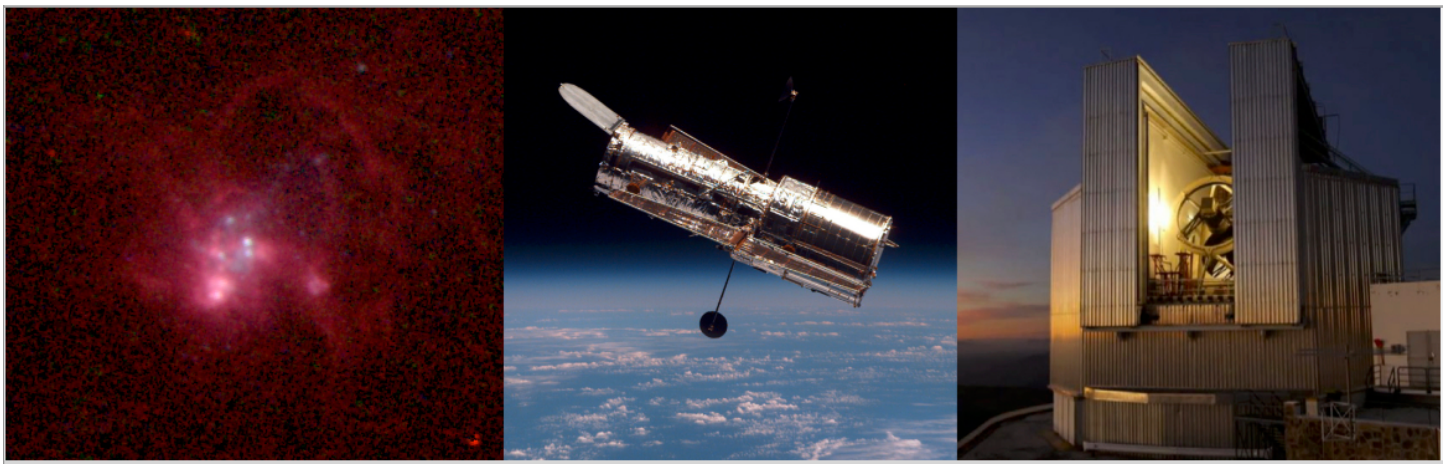
Seminario

Miércoles 28 de noviembre, 2018, 11:30 hrs (PST), Auditorio IA-Ensenada

Stars and gas in the most metal-poor galaxies I: SBS 0335-052E.



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SBS 0335-052E is one of the most metal-poor starburst galaxies known in the nearby Universe (12+log(O/H)=7.3, Z ∼ 0.001, z = 0.0135). We test spectral synthesis models with non-rotating single stars of up to M_{up} = 300 M⊙ against co-spatial Hubble Space Telescope (HST) Cosmic Origins Spectrograph (COS) and Very Large Telescope (VLT) Multi Unit Spectroscopic Explorer (MUSE) observations of this galaxy. The observed region integrates the light of four super star clusters (SSCs). For the first time in such a metal-poor galaxy, the intrinsic C IV λλ1549, 1551 doublet is resolved into interstellar absorption, interstellar emission, and stellar-wind components. He II λ1640 is in pure nebular emission (FWHM ∼ 170 km s^{-1}). We discard an active galactic nucleus and high-mass X-ray binaries as dominant ionizing sources in the observed region. We present tentative optical evidence of the presence of WR stars near one of the observed SSCs. We fit the UV and optical observables separately. Simple stellar populations (SSPs) with M_{up} = 300 M⊙ and Z ∼ 0.001 provide the best fit to the UV and optical observables, but predict a broad stellar He II λ1640 component which is not present in the observations. From fits to the UV (optical) observations using M_{up} = 300 M⊙ and Z ∼ 0.001 we obtain the following median-model physical properties: age = 2.4 (2.4) Myr, 12+log(O/H)=7.2 (7.4), and log(C/O)=-0.53, respectively. O/H is consistent with values from standard methods and C/O is significantly higher than previous determinations. Our study highlights the need for testing additional sources of ionization, for instance, fast radiative shocks of sub-SMC metallicity.

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