



# The Young, the Old, and the Dusty: Stellar Populations of AGN Hosts

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Studying the average properties of active galactic nuclei (AGN) host stellar populations is an important step in understanding the role of AGN in galaxy evolution and the processes which trigger and fuel AGN activity. Here we calculate model spectral energy distributions (SEDs) that include emission from the AGN, the host galaxy stellar population, and dust enshrouded star formation. Using the framework of cosmic X-ray background population synthesis modeling, the model AGN hosts are constrained using optical (B band) and near infrared (J band, 3.6  $\mu\text{m}$ , 5.7  $\mu\text{m}$ , 8.0  $\mu\text{m}$ , and 24  $\mu\text{m}$ ) luminosity functions and number counts. It is found that at  $z < 1$ , type 1 and type 2 AGN hosts have similar stellar populations, in agreement with the orientation based unified model and indicative of secular evolution. At  $z > 1$ , type 2 AGN hosts are intrinsically different from type 1 AGN hosts, suggesting that the simple orientation based unified model does not hold at  $z > 1$ . Also, it is found that if Compton thick (CT) AGN evolve like less obscured type 2 AGN, then, on average, CT AGN hosts are similar to type 2 AGN hosts; however, if CT obscuration is connected to an evolutionary stage of black hole growth, then CT AGN hosts will also be in specific evolutionary stages. Multi-wavelength selection criteria of CT AGN are discussed.

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