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Modeling the horizontal branch: unlocking the secrets of ancient star formation

Monday, 18 September 2017 12:00 (15 minutes)

I will present a new method that uses the horizontal branch morphology to determine the ancient star formation history of nearby resolved galaxies. Horizontal branch stars are bright and ancient, and their photometric properties depend on age and metallicity. The reason why the horizontal branch is usually neglected in the star formation history determinations of resolved galaxies is the uncertain amount of mass lost on the red giant branch. I will describe a new modeling code that, for the first time, combines classical analysis techniques with synthetic horizontal branch modeling, treating the mass loss as a free parameter and determining star formation histories that are consistent with all the major stellar evolutionary phases. I will show tests of the method and of the code's performance. The analysis of bright color-magnitude features and the advent of next generation telescopes will greatly increase the number of galaxies where accurate star formation histories can be obtained

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Session Classification: Ages of the oldest stars and the connection to the halo and accretion