

Abstract Submitted
for the NWS15 Meeting of
The American Physical Society

The Knobs that Dial Up a Galaxy GUY WORTHEY, Washington State University — There are hundreds of billions of stars in a typical galaxy, seemingly organized and orderly. Yet, eons ago, those stars were billows of primordial hydrogen and helium gas, fresh from the foundry of the expanding young universe. Connecting the dots between then and now is a fascinating frontier in modern astrophysics. I report here on efforts to analyze the spectrum of a galaxy to discover what truly drives it. We track (1) when stars condense out of gas during the assembly of the galaxy, (2) how newly created elements from the nucleosynthetic furnaces of stars are distributed and then reincorporated in subsequent generations of stars, (3) the elemental signatures of different flavors of enrichment, such as different types of supernova explosions, (4) the rules about how stars lose mass back to space during their lifetime, and (5) at formation time, the number of stars born at each stellar mass. One might notice that almost all of these items are keying in on the component stars, and that is the paradigm shift this research is ushering in. It is time to learn about stars by studying galaxies, not the other way around.

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Date submitted: 08 Apr 2015

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