PERUGIA 2023 APS ADVANCED PHYSICS SEMINARS

MERCOLEDÌ 4 OTTOBRE

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Decoding the Lives of Red Giant Stars: New Spectroscopic Clues

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Stars in their late evolutionary stages undergo many changes as their interior engines use up nuclear fuel and prepare to die violently as supernovae or meekly as white dwarfs. These aging red giant stars stars execute major movement in the Hertzprung-Russell diagram, and they pulsate on short and long timescales. Their surface light element abundances (e.g. CNO) change in expected ways but sometimes also in baffling ways. In particular, for a few decades we have struggled to understand the curious appearance of extremely large lithium abundances in about 1% of red giants. More recently, we have discovered that many lithium-rich red giants have extremely strong helium 10830A absorption lines, which suggests abnormally active chromospheres of these stars. Additionally, both the Li and He spectroscopic features often are accompanied by large stellar rotational velocities. In this talk I will explore the correlations among these spectroscopic features, and try to relate these observational parameters to recent past actions and expected near-future changes in red giants.