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From alpha to omega: improved tests of the stability of fundamental couplings and their cosmological implications

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Astrophysical tests of the stability of fundamental couplings such as the fine-structure constant α and the proton-to-electron mass ratio μ are a key probe of fundamental physics and cosmology. A new generation of high-resolution spectrographs and improved statistical analysis techniques are enabling tests with improved sensitivities and larger redshift ranges. I will present new astrophysical measurements of α , from the ESPRESSO collaboration and other facilities, and discuss their impact on models of dark energy. Time permitting I may also briefly highlight how the field will evolve in the coming years.

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