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Accession Number

12277627

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Author Unabbreviated

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Title

Identification of new hydrogen states

Source

Physics Essays, vol.24, no.1, March 2011, 95-116. Publisher: American Institute of Physics, USA.

Abstract

Classical physical laws predict that atomic hydrogen may undergo a catalytic reaction with certain species including itself that can accept energy in integer multiples of the potential energy of atomic hydrogen, m27.2 eV, where m is an integer. The predicted reaction involves a resonant, nonradiative energy transfer from otherwise stable atomic hydrogen to the catalyst capable of accepting the energy. The product is H(1/p), fractional Rydberg states of atomic hydrogen called "hydrino atoms," where n=1/2,1/3,1/4,...,1/p (p <= 137 is an integer) replaces the well-known parameter n=integer in the Rydberg equation for hydrogen excited states. Each atomic hydrino state also comprises an electron, a proton, and a photon, but the field contribution from the photon increases the binding rather than decreasing it corresponding to energy desorption rather than absorption. Since the potential energy of atomic hydrogen is 27.2 eV, one or more (m) H atoms can act as a catalyst for a given H by accepting m27.2 eV from it. Following the nonradiative energy transfer, further energy as characteristic continuum radiation having a short-wavelength cutoff of m²13.6 eV is released as the hydrino transitions to a final stable radius of 1/(1 + m) that of H. The transition also selectively produces extraordinary high-kinetic energy H. Hydrino transitions were observed experimentally by the predicted catalyst excitation, continuum emission, and hot H. Similar to the case with the 21 cm (1.42 GHz) line of ordinary hydrogen, hydrino atoms were identified by its predicted 642 GHz spin-nuclear hyperfine transition observed by terahertz absorption spectroscopy of cryogenically cooled H₂ below 35 K. Hydrinos react to form molecular hydrino and hydrino hydride ions that are much more stable than the ordinary variants and have characteristic predicted energies, spectra, and NMR shifts. Synthesized and naturally occurring molecular hydrinos were observed by electron beam excited rovibrational spectral emission and proton NMR. Hydrino hydride ions were observed by proton NMR (nuclear magnetic resonance) and XPS (X-ray photoelectron spectroscopy). The hydrino continua spectra directly and indirectly match significant celestial observations, and the characteristics of the hydrino indicate that it is dark matter. (99 References).