A Time-symmetric Hubble-like Law: Light Rays Grazing Randomly Moving Galaxies Show Distance-Proportional Redshift

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Z. Naturforsch. **58a,** 807 – 809 (2003);
received November 24, 2003

A new class of dissipative structures is proposed that live in real space rather than phase space. A light ray passing through a soup of randomly moving gravitating masses is a case in point. It suffers a "dynamic path elongation" since the random pushes and pulls have a greater probability of increasing than decreasing its path length. Time reversal then re-shrinks the path in question in a conspirational manner, while a close-by nonselected path gets expanded. This is a new statistical-mechanics phenomenon. The latter at the same time qualitatively reproduces the well-known Hubble phenomenon of distance-proportional light-path expansion in the cosmos. A preliminary quantitative estimate, based on the Birkinshaw equation with an assumed bias factor of three, is also presented.

Key words: Hubble Law; Time Reversibility; Chaotic Billiards; Fermi Deceleration; Stirred Lentils' Soup.