



CU Physics Department Colloquium

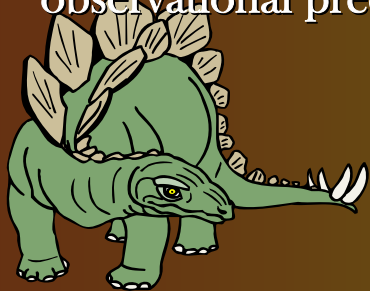
Monday, February 18, 2008 4:10 PM 428 Pupin Hall



DO EXTRAGALACTIC COSMIC RAYS INDUCE CYCLES IN FOSSIL DIVERSITY?

Mikhail Medvedev, University of Kansas

Recent work has revealed a 62 ± 3 Myr cycle in fossil diversity in the past 542 Myr; however, no plausible mechanism has been found. We propose that the cycle may be caused by modulation of cosmic-ray (CR) flux by the solar system vertical oscillation (64 Myr period) in the Galaxy, the Galactic north-south anisotropy of CR production in the Galactic halo/wind/termination shock (due to the Galactic motion toward the Virgo Cluster), and the shielding by Galactic magnetic fields. We revisit the mechanism of CR propagation and show that CR flux can vary by a factor of about 5 and reach a maximum at northernmost displacement of the Sun. The very high statistical significance of (1) the phase agreement between solar northward excursions and the diversity minima and (2) the correlation of the magnitude of diversity drops with CR amplitudes through all cycles provide solid support for our model. Various observational predictions which can be used to confirm or falsify our hypothesis are presented.



HOSTED BY ANDREI BELOBORODOV

