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Did a Gamma-Ray Burst Initiate the Ordovician Extinction?
ADRIAN MELOTT, University of Kansas — A GRB within our galaxy could have catastrophic consequences for the Earth. Extrapolations from the global rate suggest an average interval of 0.1 to 1 Gy for events in which the Earth is irradiated from a distance of a few kpc. Prompt emission would irradiate the surface with UV at least as intense as the present solar IR/visible/UV flux. The atmosphere would become heavily ionized, resulting in major destruction of the ozone layer. Both the prompt UV and that resulting from long-term loss of the ozone layer are destructive to living organisms. The attenuation length of UV in water is tens of meters. There is a strong candidate for a GRB based mass extinction in the late Ordovician, 440 My ago. Planktonic organisms and those animals living in shallow water seem to have been particularly hard hit during this mass extinction. We present the results of of a series of simulations of the response of the Earth's atmospheric chemistry and the resulting ozone flux to a plausible Milky Way gamma ray burst. łhttp://kusmos.phsx.ku.edu/∼melott/Astrobiology.htm

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