

PHYSICAL MATHEMATICS SEMINAR

SINGULAR BLOW-UP AT THE PERMIAN- TRIASSIC BOUNDARY

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ABSTRACT:

About 252 million years ago, as the Permian period gave way to the Triassic, roughly 90% of all living species disappeared from the fossil record. This event, the most severe extinction in Earth history, was accompanied by a rapid (~10,000 year) change in the carbon isotopic composition of seawater. By transforming these chemical changes to physical fluxes, we show that the isotopic event is consistent with an incipient singularity in the growth of the oceans' reservoir of dissolved inorganic carbon. The singular influx of carbon dioxide into the oceans indicates a fundamental nonlinearity in Earth's carbon cycle. Its identification suggests that any hypothesis for the extinction's cause should predict such a blow-up. We identify a biological mechanism with this property and discuss its relevance to observations.

TUESDAY, APRIL 13, 2010

2:30 PM

Building 2, Room 105

*Refreshments at 3:30 PM in Building 2, Room 290
(Math Department - Common Room)*

<http://math.mit.edu/pms/spring10/>



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