

# THE BREAKUP OF EARTH: FROM MECHANICS TO GEOLOGY

## Speaker

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## Abstract

The magma ocean that existed on the early Earth finally solidified to form a coherent lithosphere. This lithosphere insulated the underlying mantle leading to warming, thermal expansion, partial melting and a geoid bulge. This in turn may trigger breakup of the lithosphere and the onset of plate tectonics.



Consequently, heat balance is disturbed, which results in thermal fluctuation. On a global scale, a cycle of warming and cooling happened many times throughout geological history. This in turn may induce geological events as a response to the thermal cycles. The speaker will present a simple model of Earth evolution as a thermal system, based on rock fracture modeling method, trying to answer many questions about Earth's history that are yet unanswered.

## Biography

Dr. C.A. Tang serves as the Director of the Center for Rock Instability and Seismicity Research (CRISR) at Dalian University of Technology, China. He holds the position of Chair Professor of the Ministry of Education and Chair Professor at the Computational Geoscience Research Center at Chengdu University of Technology, China. Additionally, he holds the role of Vice President of the Chinese Society of Rock Mechanics (CSRM) and is the China National Group Chairman of the International Society of Rock Mechanics. Dr. Tang obtained his Ph.D. in 1988 from Northeastern University in Shenyang, China, and pursued post-doctoral work at Imperial College London, UK, from 1991 to 1992. He has engaged in academic visits to establish research collaborations in various countries, including Canada, Australia, Sweden, Singapore, Switzerland, and Hong Kong. Leading multiple significant research projects in rock mechanics, with a focus on rock failure process analysis and monitoring in civil engineering, he has authored over 300 technical papers on rock failure mechanisms and civil engineering. Dr. Tang has written six books on rock mechanics and is the primary author of "Rock Failure Mechanisms," published by CRC Press, Taylor & Francis Group. In recent years, Dr. Tang has directed his attention towards Earth science research and has introduced a new theory of Earth Evolution based on a mechanics perspective which he will present in this talk.



**16 August 2024  
Friday**



**10:30 am - 11:30 am**



**Civil Engineering  
Conference Room  
Room 3574 (Lift 27/28)  
HKUST**

## Enquiry:

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