

Short Course on Impact Cratering

Speaker: Professor H. J. Melosh



(Distinguished Professor of Earth, Atmospheric and Planetary Science, Purdue University, USA)



This short course consists of three lectures:

1. Introduction to impact cratering: History of study and implications for science
2. Shock waves and Crater Mechanics: The three stages of impact cratering
3. Numerical modeling of impact craters

These three lectures will offer a brief introduction to the process of impact cratering, starting from a historical perspective that will introduce why impact craters are important to us today. A second lecture will focus on basic ideas of shock waves, their interaction with geologic materials, and the underlying mechanics of the impact process. I will also discuss how to recognize whether or not a circular structure on Earth was caused by impact (the vast majority are not, despite numerous claims by overenthusiastic geologists!). The course will wrap up with a description of how impacts are modeled numerically and the basic requirements of numerical models explained. I will also introduce the class to iSALE, currently the premier tool for modeling impact processes.

Schedule:

Lecture 1: January 18th (Wed), 11:00am-12:30pm, @B700

Lecture 2: January 18th (Wed), 4:00pm-5:30pm, @B700

Lecture 3: January 20th (Fri), 11:00am-12:30pm, @C210

Contact:

If you would like to attend the lectures, please contact Kaori Egashira (e-kaori@oist.jp).

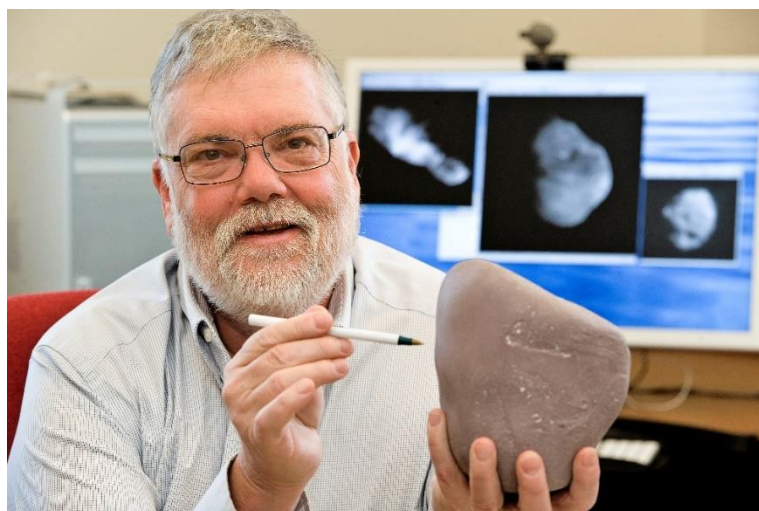
Introductory material about the course will be sent to the participants.

Brief Biography of H. J. Melosh:

H. J. Melosh is a Distinguished Professor of Earth, Atmospheric and Planetary Science at Purdue University in West Lafayette, IN. He also holds appointments in the departments of Physics and Astronomy and Aeronautical and Aerospace Engineering at Purdue. He received an AB degree in Physics from Princeton University in 1969 and a PhD in Physics and Geology from Caltech in 1973. His principal research interests are impact cratering, planetary tectonics, and the physics of earthquakes and landslides. His recent research includes studies of the giant impact origin of the moon, the K/T impact that extinguished the dinosaurs, the ejection of rocks from their parent bodies and the origin and transfer of life between the planets. He was a science team member of NASA's Deep Impact mission that successfully cratered comet Tempel 1 on July 4, 2005 and flew by comet Hartley 2 on November 9, 2010. He is also a Co-Investigator of the GRAIL mission that returned detailed data on the Moon's gravity field.

Professor Melosh is a Fellow of the Meteoritical Society, the Geological Society of America the American Geophysical Union and American Association for the Advancement of Science. He was awarded the Barringer Medal of the Meteoritical Society in 1999, the Gilbert prize of the Geological Society of America in 2001 and the Hess Medal of the American Geophysical Union in 2008. He was a Guggenheim Fellow in 1996-1997 and a Humboldt Fellow at the Bavarian Geological Institute in Bayreuth, Germany, in 2005-2006. Asteroid #8216 was named "Melosh" in his honor. He was elected to the U.S. National Academy of Sciences in 2003 and the American Academy of Arts and Sciences in 2011. In 2014 he was awarded the McCoy award of Purdue University.

He has published approximately 200 technical papers, edited two books and is the author of a major monograph, *Impact Cratering: A Geologic Process* and a text "Planetary Surface Processes" with Cambridge University Press.



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