
1:00 – 2:30 p.m. **LUNCH**

WELCOME

Quentin Kennedy

Chair, Lamont-Doherty Advisory Board

Frank Gumper

Vice Chair, Lamont-Doherty Advisory Board

THE OBSERVATORY TODAY

Arthur Lerner-Lam, Lamont-Doherty Interim Director

LUNCHEON PRESENTATION

Peak Earth: Population, Climate, and Energy in the 21st Century

A Conversation with

Peter B. Kelemen, Arthur D. Storke Memorial Professor of Geochemistry, Department of Earth and Environmental Sciences, Columbia University and

Michael Cembalest, Chief Investment Officer, J.P. Morgan Private Bank and Lamont-Doherty Advisory Board member

As the number of inhabitants on Planet Earth approaches 7 billion, the energy demands of this exponentially growing population are significantly altering the natural environment. While carbon-based fuels are causing atmospheric CO₂ to rise at an unprecedented rate, alternative energy sources have been slow to materialize. Kelemen and Cembalest will look ahead to consider the consequences of unchecked growth and discuss the current rush for mineral exploration, the large fluctuations in their market value, and why they're essential for a post-oil transition.

2:30 – 3:15 p.m. **MASTER CLASSES**

(CHOOSE ONE) PROGRAM SUBJECT TO CHANGE

Innovative Imaging of the Antarctic Ice Sheet

Robin Bell, Palisades Geophysical Institute Lamont Research Professor, Columbia University

For scientists to envision the physical changes a warming climate might herald, such as rising global

sea level, understanding the linkages between ice sheet processes and subglacial geology is key. Bell, who has led several international teams to the Antarctic on expeditions to survey the ice sheet's interior, will describe her group's efforts to ascertain the speed at which Antarctica's vast ice sheets are changing.

Mapping the Source of Great Alaskan Earthquakes

Donna Shillington, Lamont Assistant Research Professor, Marine Geophysics

Subduction zones create the largest, most destructive earthquakes on the planet, but many mysteries remain about the plate tectonic boundary where these quakes originate. Shillington will describe how marine seismic data collected by her team onboard Lamont-Doherty's research vessel, the Marcus G. Langseth, in the summer of 2011 sheds light on one of the most seismically active zones in the world.

Geological Carbon Capture and Storage: How Does It work?

Peter B. Kelemen, Arthur D. Storke Memorial Professor of Geochemistry, Department of Earth and Environmental Sciences, Columbia University

Kelemen investigates ways to harness the carbon storage potential in rocks that originate deep within the earth and are brought to the surface during tectonic collisions or volcanic eruptions. In Kelemen's laboratory, participants will examine such specimens and learn about the unique properties that make them an important part of the solution to the global rise of carbon dioxide.

Deadzones and Ghosts of Oil Plumes

Ajit Subramaniam, Lamont Associate Research Professor, Marine Biology

Deadzones—areas where low oxygen concentration harms marine organisms—develop in the Gulf of Mexico every summer. People attribute deadzones to the overuse of fertilizers in the Midwest, which travel down the Mississippi and cause phytoplankton blooms in the Gulf. It was widely predicted that the Deepwater Horizon accident would exacerbate the problem. Subramaniam, who recently returned from a research cruise in the region, will discuss deadzones and the oil's actual impact on this ecosystem.

3:45 p.m. **FINAL PLENARY**

Climate and Life: The Science Behind Sustainability

INTRODUCTION

Peter B. deMenocal, Professor and Chair, Department of Earth and Environmental Sciences, Columbia University

Lamont-Doherty's new biogeochemistry group applies cross-disciplinary research to understand how climate shapes life on earth. Using newly developed analytical methods, researchers unlock secrets found in the molecular fossils of ancient life, which hold records of earlier climate conditions. Today's two discussions illustrate how these techniques are currently being used at Lamont-Doherty.

Did the Rise of the Himalayan Mountains Cause Global Cooling?

Pratigya J. Polissar, Lamont Assistant Research Professor, Biogeochemistry

The earth cooled from a hothouse climate 60 million years ago to a relative icehouse climate today. To determine whether the rise of the Himalayan mountains may have caused the cooling, we need to know when the mountains formed. A new technique using organic molecules from plants allows us to reconstruct the past elevation of the land surface and test this hypothesis.

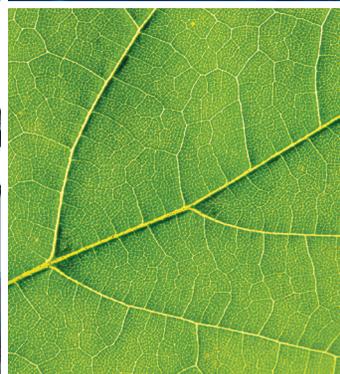
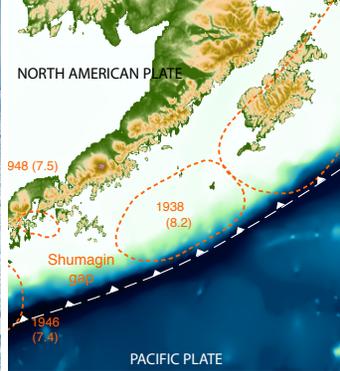
When in the Past Were CO₂ Levels as High as They Are Today? What Was the Climate Like at that Time?

Bärbel Hönlisch, Assistant Professor, Department of Earth and Environmental Sciences, Columbia University

Hönlisch, who studies the acidification of our oceans, will answer these questions and explain how scientists use the microscopic shells of marine organisms to reconstruct past temperatures, ocean acidity and atmospheric CO₂ concentrations. She will demonstrate how this earth history informs predictions about how the current climate system will function in the future.

4:30 p.m. **COCKTAIL RECEPTION**

Scroll down for R.S.V.P. information



Join the experts for an intimate lunch and an afternoon of science master classes covering a wide range of cutting-edge research. Geochemists, paleoclimatologists, marine geophysicists and geologists will discuss some of the most dynamic processes shaping our natural world and the implications their research holds for the future.

Members of the Director's Circle have a keen interest in the natural world, and are eager to stay informed about groundbreaking advances in the field of environmental science. Throughout the year, Director's Circle members receive invitations to events with Lamont-Doherty experts and gain access to its network of researchers, scholars and policymakers. Once a year, the Advisory Board hosts a special afternoon of science master classes at the Observatory where participating members and guests can visit the labs and have personal conversations with world-renowned researchers.

The Director's Circle recognizes supporters of Lamont-Doherty Earth Observatory who contribute annual gifts of \$2,000 or more. These gifts include support for an Innovation Fund, which awards annual grants to researchers at the Observatory who are pursuing new areas of scientific investigation.

Lamont-Doherty Earth Observatory, a key component of the Earth Institute, Columbia University, is one of the world's leading research centers seeking fundamental knowledge about the origin, evolution and future of the natural world. More than 300 scientists and students study the planet from its deepest interior to the outer reaches of its atmosphere, on every continent and in every ocean. From global climate change to earthquakes, volcanoes, nonrenewable resources, environmental hazards and beyond, Observatory scientists provide a rational basis for the difficult choices facing humankind in stewarding the planet.

If you would like more information about the Observatory or to RSVP for the event, please contact Barbara Charbonnet, Director for Development, at bcharb@LDEO.columbia.edu or 845-365-8585.

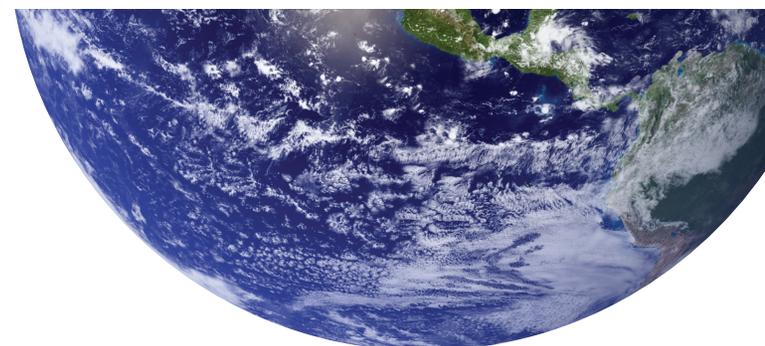
Be Our Guest at an Afternoon of Science Master Classes

Saturday, October 22, 2011
1:00 to 5:00 p.m.

Lamont-Doherty Earth Observatory
Route 9W, Palisades, New York



Director's Circle



Lamont-Doherty Earth Observatory
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