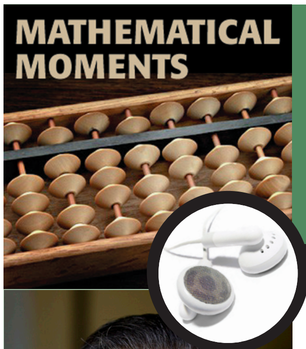
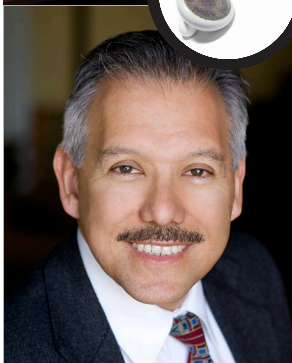


Predicting Climate

AMS Podcast Series



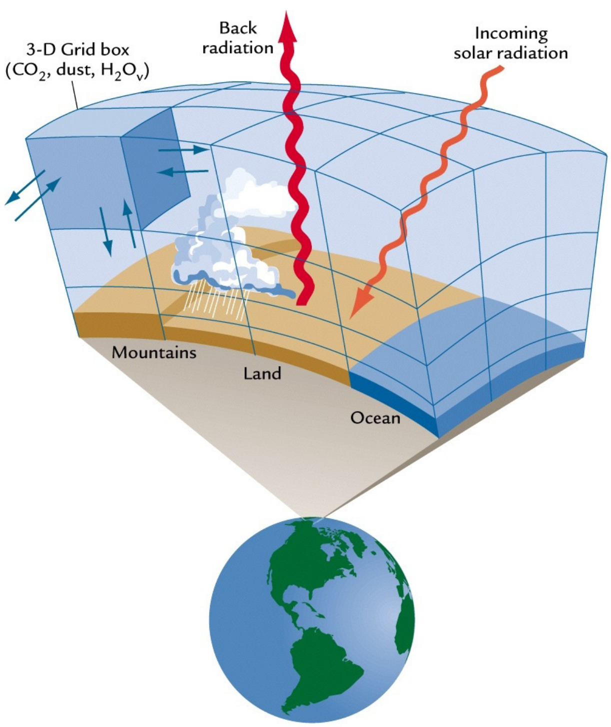
Juan Meza,
Lawrence Berkeley
National Laboratory

• Podcast Chapter 1

• Podcast Chapter 2

What's in store for our climate and us? It's an extraordinarily complex question whose answer requires physics, chemistry, earth science, and mathematics (among other subjects) along with massive computing power. Mathematicians use partial differential equations to model the movement of the atmosphere; dynamical systems to describe the feedback between land, ocean, air, and ice; and statistics to quantify the uncertainty of current projections. Although there is some discrepancy among different climate forecasts, researchers all agree on the tremendous need for people to join this effort and create new approaches to help understand our climate.

It's impossible to predict the weather even two weeks in advance, because almost identical sets of temperature, pressure, etc. can in just a few days result in drastically different weather. So how can anyone make a prediction about long-term climate? The answer is that climate is an *average* of weather conditions. In the same way that good predictions about the average height of 100 people can be made without knowing the height of any one person, forecasts of climate years into the future are feasible without being able to predict the conditions on a particular day. The challenge now is to gather more data and use subjects such as fluid dynamics and numerical methods to extend today's 20-year projections forward to the next 100 years.



For More Information: *Mathematics of Climate Change: A New Discipline for an Uncertain Century*, Dana Mackenzie, 2007.

Image courtesy of William F. Ruddiman and W.H. Freeman and Company.

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