Mathematics Colloquium

Exploring the behavior of forced dynamical systems in conceptual models of the Earth's climate

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Friday, June 1, 2018
4:10 – 5 p.m.
Building 53 Room 206

Abstract

Nonlinear dynamical systems consisting of coupled nonlinear ordinary differential equations are the basis for many mathematical models for systems in physics, biology and numerous other fields. Traditional dynamical systems consist of smooth autonomous equations where the current state of a system determines the evolution of that state; there is a deep mathematical theory underlying our understanding of the qualitative nature of solutions to such systems. However, many real world systems incorporate non-autonomous terms representing imposed external forcing. Furthermore, models are often formulated using non-smooth equations to represent the effect on the modeled variables of fast processes which are not resolved by the model. Extending traditional dynamical systems theory to non-smooth and forced systems is an area of active research.

We will explore the complex interaction which can occur between external oscillatory forcing and internal model dynamics using some smooth and non-smooth dynamical system models which have been proposed to explain the observed changes in the Earth's climate system over the last 2-3 million years.

About the speaker: Charles D. Camp ('Dave') received his doctorate in Applied and Computational Mathematics from Caltech in 2004. Before joining the Mathematics Department at Cal Poly in 2007, he was a postdoc at the University of Washington and taught at Seattle University. Before starting his graduate studies, Dave worked for Aret Associates in the field of physical oceanography. He received a B.A in Mathematics from the University of California at San Diego with minors in Physics and Music. His current research interests include mathematical modeling and the development of linear and nonlinear data analysis techniques with particular emphases on geophysical and climate systems.

Cookies will be provided before the talk at 4 p.m.
in the same room as the talk, Building 53 Room 206.