

MCRN Newsletter

March 4, 2016 - Issue 13



MCRN Colloquium Webinar

Monday, March 7, 2016, 4pm EST: Axel Timmermann
(International Pacific Research Center, University of Hawaii)
[Webinar Link](#)

Nonlinear dynamics of the El Niño Southern Oscillation

Abstract: Currently, the strongest El Niño on record wreaks havoc across our planet, shifting global sea level and weather patterns and creating famines in South Africa and Central America. Other areas have experienced flooding which may have facilitated the outbreak of the mosquito-borne Zika virus across parts of Brazil and the Dengue virus in Hawaii.

Even though this event has led to massive disruptions of livelihoods and economies, many of its physical aspects still remain elusive: What caused its explosive growth in summer 2015? Why did a similar initial condition in 2014 trigger only a small event? Why are La Niña events weaker than El Niño events? What processes terminate El Niño events? How long can an El Niño last? These are crucial questions that need to be resolved to improve seasonal predictions of future climate anomalies in the tropical regions.

My talk will address how concepts of nonlinear dynamical systems' analysis can help to elucidate the underlying processes and timing of El Niño's growth and demise. The presentation will touch upon Combination modes, Nonlinear resonances, Global Bifurcations, Mixed Mode Oscillations, Noise-induced instabilities and forbidden return times.

The following speaker is in 4 weeks. **Juan Durazo** (Arizona State University) will present on Monday, April 11, 2016, 4pm EDT (UTC-4 hours). Please note that this will be after the US and many other countries change to/from Daylight Savings Time.

Message from Hans Kaper:

The upcoming [SIAM Conference on Mathematics of Planet Earth \(MPE16\)](#) has a call out for proposals for minisymposia, with a deadline of March 2. This is a soft deadline, we will consider submissions until the end of March.

This is an excellent opportunity to showcase the work of

Date for 2016 MCRN Annual Meeting?

Please [email Chris Jones](#) if you have a strong preference on holding the MCRN Annual Meeting on Thursday, September 29, or Monday, October 3 (i.e., **before or after the [SIAM Mathematics of Planet Earth conference](#)**).

Upcoming

March 7: Abstract deadline for the [11th International EnKF Workshop](#)

March 18: SIAM MPE Student and Post-doc/Early Career [Travel Award](#) Applications due

March 30 - April 1: [Climate Modeling Workshop](#)

News

Solicitation: [5th Data Analysis and Modeling in Earth Science \(DAMES\) conference](#)

Research Focus Group Update

• [Biogeochemistry & Carbon Cycle](#)- Feb 22, Daniel Rothman (MIT) presented his paper

MCRN. (Don't be shy. Proposals from MCRN members will be given special consideration.)

The conference themes are:

- (1) Planet Earth as a physical system (climate dynamics, oceans, atmosphere, cryosphere, earth and space);
- (2) Planet Earth as a supporting life (mathematical ecology, carbon cycle, food systems, natural resources, sustainability);
- (3) Planet Earth as a system organized by humans (land use, energy, communication, transportation, socio-economics; and
- (4) Planet Earth as a system at risk (global change, biodiversity, water, food security, epidemics, extreme events).

Mark your calendars: MPE16 will take place in Philadelphia, Pennsylvania, September 30-October 1, 2016.

The conference organizers, [Hans Engler](#), [Hans Kaper](#), [Mary Lou Zeeman](#) and [Antonios Zagaris](#)

In case you missed it...

View [Adaptive mesh refinement for storm surge modeling](#) by **Marc Kjerland**. Feel free to [email Marc](#) with questions.

(with) presented his paper "Earth's Carbon Cycle: A Mathematical Perspective."

- [Fast/Slow Systems](#)- Feb 17, Kate Meyer led discussion of Chapter 2 of Chris' notes.

- [Minnesota Mathematics of Climate Seminar](#)- On March 8, 12:15 EST, Priyam Raghuraman will talk about glacial cycles.

- [Nonautonomous Bifurcations and Rate-induced Tipping \(NBRIT\)](#) is meeting in a research capacity bi-weekly.

- [PaleoSeminar](#)- On March 9, 12:30 EST, Courtney Quinn (Exeter) will continue presenting "Deep-water formation variability explored through Boolean delay equations."

Newsletter FYI

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