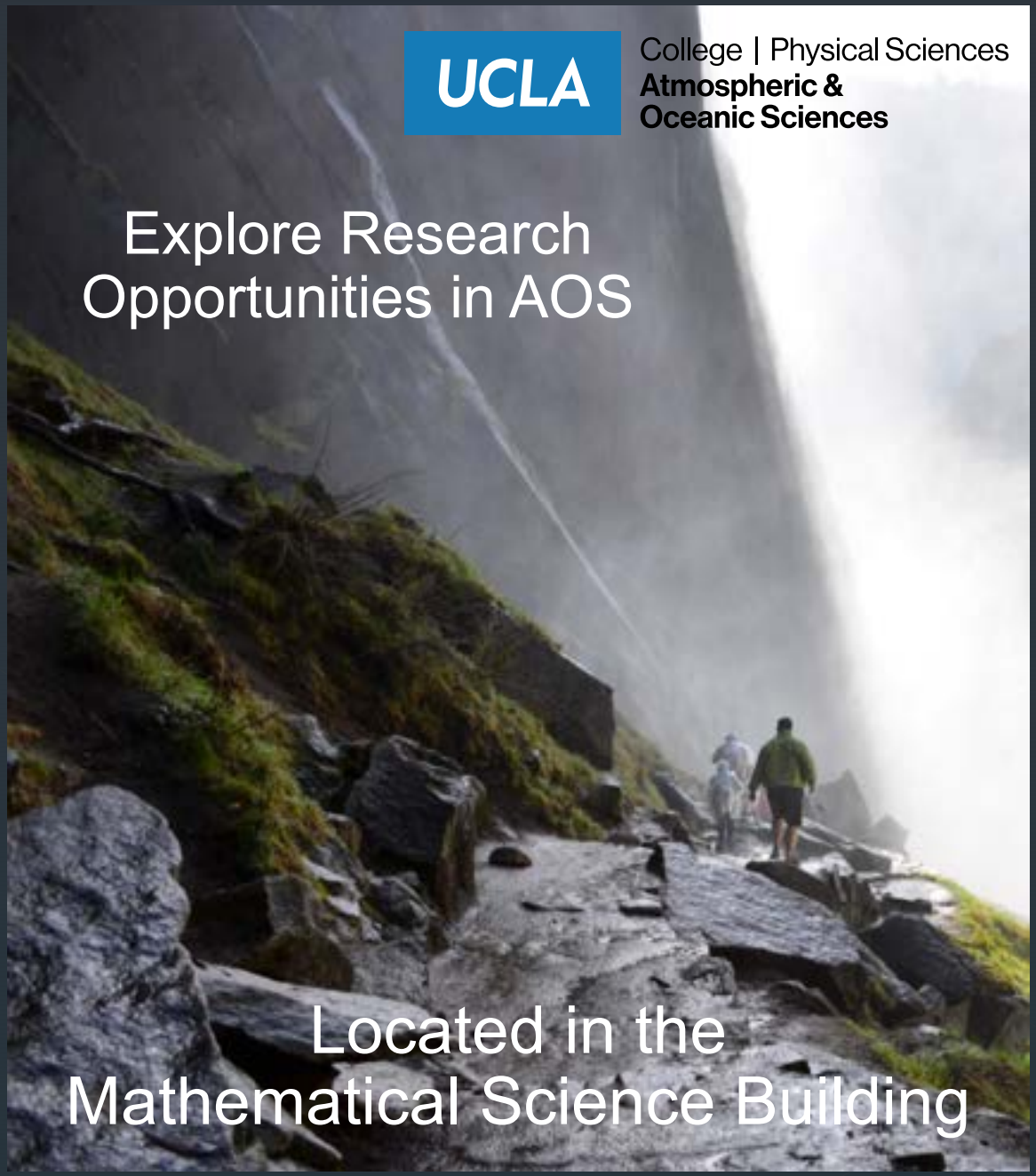
UCLA

College | Physical Sciences
Atmospheric & Oceanic Sciences

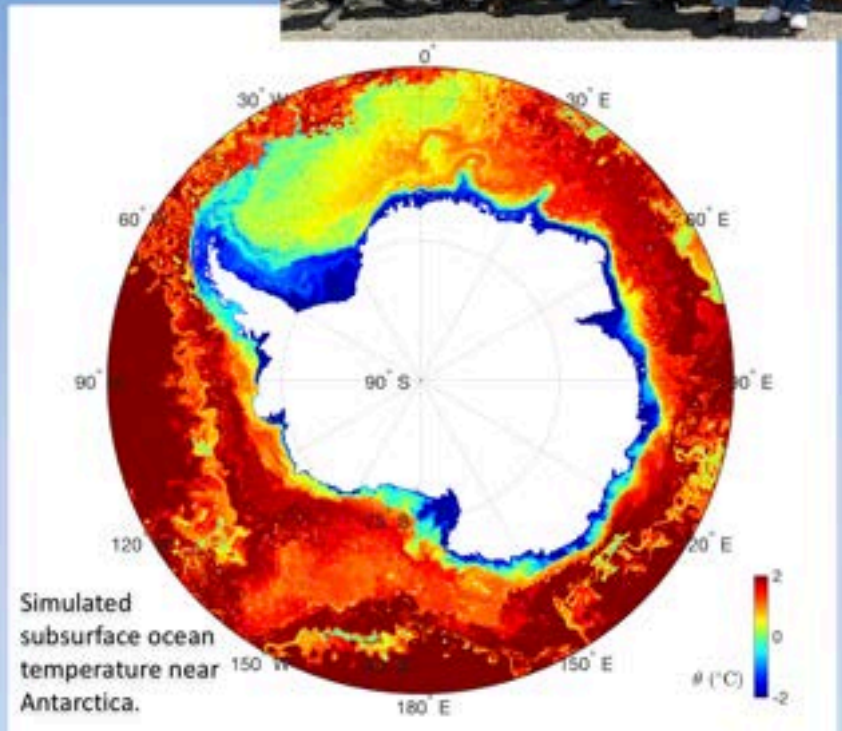

UCLA
College | Physical Sciences
Atmospheric &
Oceanic Sciences
Explore Research
Opportunities in AOS
Located in the
Mathematical Science Building

Prof. Andrew Stewart

Ocean Dynamics Group

https://dept.atmos.ucla.edu/stewart

- Ocean turbulent dynamics and modeling
- Ocean interactions with sea ice and melting of land-based glaciers
- Changes in global ocean circulation pathways under climate shifts



Simulated subsurface ocean temperature near Antarctica.

Dr. Jeroen Molemaker

UCLA MARINE OPERATIONS

- Participate in oceanographic research
- https://dept.atmos.ucla.edu/marineops/
- facebook: @uclazodiac
- Contact: Dr. Jeroen Molemaker, Geology 3636, nmolem@atmos.ucla.edu

Prof. Daniele Bianchi

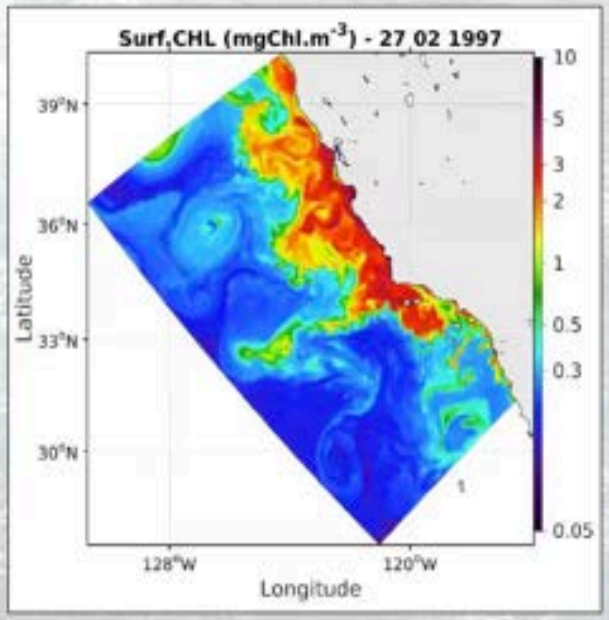
UCLA Ocean Biogeochemistry and Ecosystem Group

Group Research Interests:

- California Current Ecosystem
- Fish and Fisheries
- Ocean's Carbon, Oxygen and Nutrient Cycles
- Mesopelagic or "Twilight" Zone Ecosystem

Research projects involve analysis of observational datasets and output from numerical model simulations

Contact: dbianchi@atmos.ucla.edu, or drop by MS-7949



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Prof. Aradhna Tripati

(Paleo) carbon cycle and climate group

- Develop and apply geochemical methods
- Reconstruct past terrestrial and oceanic conditions
- Study the past to understand the present and predict the future
- Inclusive STEM

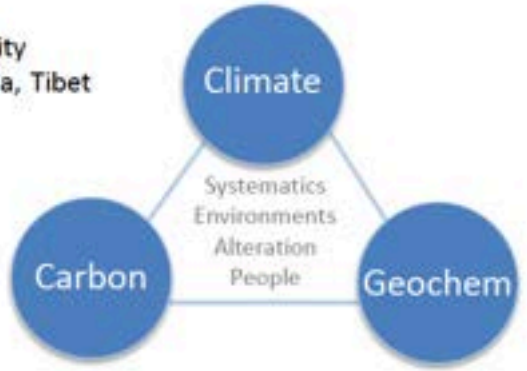
- Field, lab, model based
- Team-based science
- Community engagement

Major themes

- Physical geochemistry of heavy isotope pairing (aka 'clumping') in compounds
- Analytical frontiers in light stable isotope geochemistry
- Environmental and oceanographic reconstructions using sediments, fossils, and rocks
- Climate dynamics
- Biogeochemical interactions in environments

Examples of projects:

- Intercomparison of different instruments (mass spectrometers) used for isotope measurements
- Calibrating isotopic tracers
- Kinetic effects in isotope systems
- Earth's glacial history, and past temperature thresholds for ice sheet stability
- Regional climate histories and moisture sources in Southwest US, Argentina, Tibet
- Southern Ocean temperature and pH changes over the last glacial cycle
- Climate change - hominid evolution links in East Africa
- North Pacific Ocean stratification changes in response
- Dissolution impacts on isotopes in carbonates
- Kill mechanisms during mass extinctions
- Surface environments on early Earth
- Abrupt climate change impacts on river outflow
- Past warm climate dynamics
- Environmental contaminants and environmental justice



Prof. Aradhna Tripati: atripati@g.ucla.edu, Geol 2659

Prof. Ulli Seibt

land ecosystems and carbon-water cycles

ecosystem measurements in the tropical rainforest of Costa Rica

studies of California's native vegetation

contact: Prof. Ulli Seibt
ulli@atmos.ucla.edu

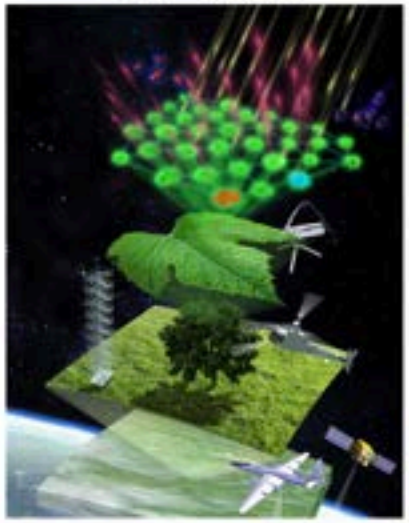
Prof. Jochen Stutz

Atmospheric Chemistry and Spectroscopy Group

Optical Trace Gas Measurements

Air Pollution Chemistry

Remote Sensing of Plants



Prof. Jochen Stutz
Email: jochen@atmos.ucla.edu
Website: https://tinyurl.com/stutz-group

Prof. Pablo Saide

Regional to local modeling of air quality and aerosol-climate interactions

Topics of research:

- Air quality forecasting and applications to field campaigns (NASA, NOAA), currently focusing on smoke from wild fires
- Satellite data and data assimilation techniques in the context of atmospheric composition
- Modeling of aerosols interactions with clouds and solar radiation to reduce uncertainties in climate projections

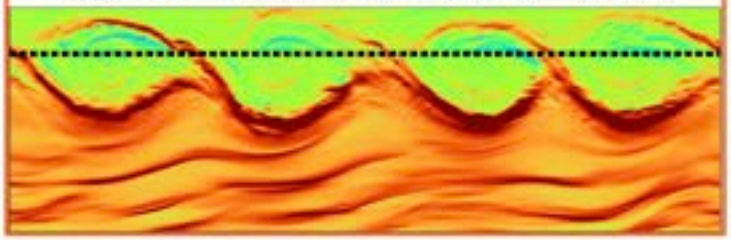
Contact:
Prof. Pablo Saide, MS 7234
Email: saide@atmos.ucla.edu
Website: https://dept.atmos.ucla.edu/saide

Prof. Marcelo Chamecki

Geophysical Boundary Layer & Turbulence Research Group

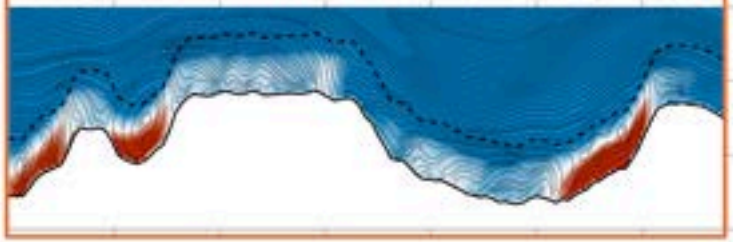
- Theory & numerical simulations of turbulent flows in the ocean and the atmosphere
- **Atmospheric applications**: winds over forest on complex topography, dust transport, arctic boundary layers
- **Ocean applications**: turbulence in coastal oceans, transport of oil & microplastics, hydrodynamics of kelp farms
- Lots and lots of theory, mathematics and programming!
- Contact: Prof. Marcelo Chamecki (chamecki@ucla.edu)

Kelvin-Helmholtz instability under a kelp farm



Stratified turbulence in the Saharan Air Layer

Wind flow in the Amazon forest (real topography)

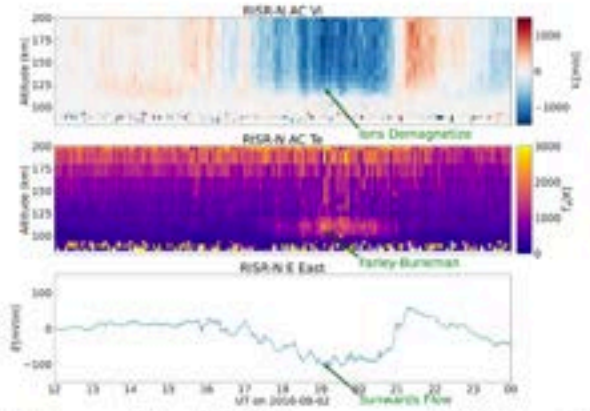


Prof. Roger Varney

Geospace Research Group

Research Interests:

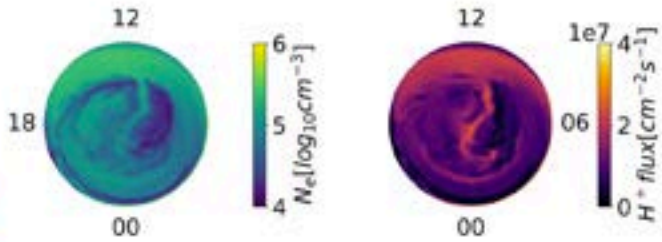
- Ionospheric structure and dynamics
- Magnetosphere-ionosphere-atmosphere coupling
- Space weather modeling
- Radar and radio propagation



Radar data showing plasma instabilities

Types of Research Projects:

- Analysis of ionospheric radar data
- Analysis of outputs from space weather models
- Analysis of other ground-based or space-based data sets



High-resolution ionospheric model

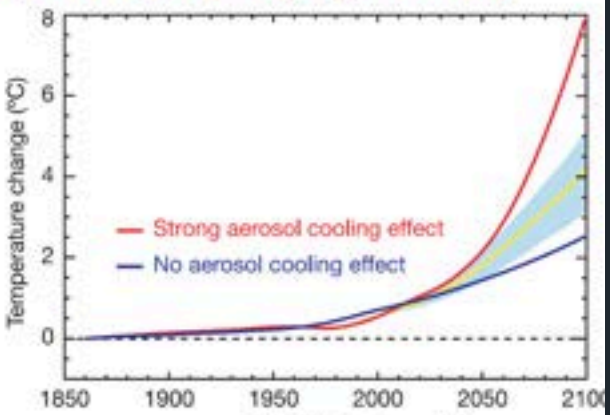
For More Information:

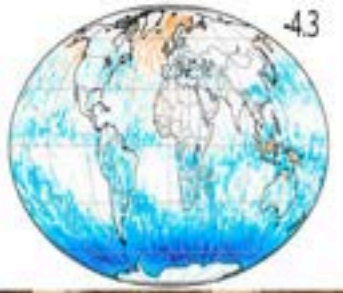
- Contact: Roger Varney rvarney@atmos.ucla.edu
- Drop by MS-7979
- Visit www.rogervarney.com

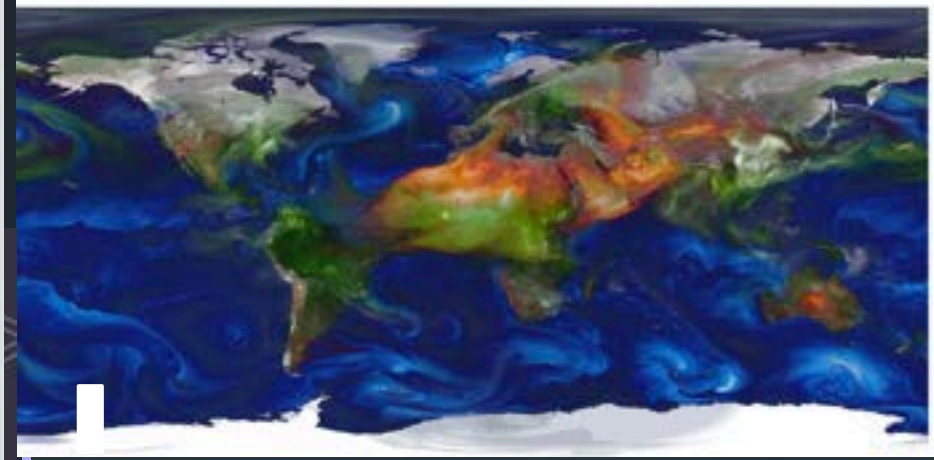
Prof. Jasper Kok

Aerosol-Climate Interactions group (my group)

- Quantifying **impacts of aerosols and clouds on climate** to:
  - Better **predict future climate changes**
  - Inform whether societally should temporarily cool planet using aerosols if/when we exceed 2° C warming (**climate intervention**)
- Undergraduate projects involve:
  - Physics & math
  - Programming
  - Analysis of data from measurements, satellites, and climate models
  - More info on http://jasperfkok.com







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Prof. Janine Baijnath-Rodino

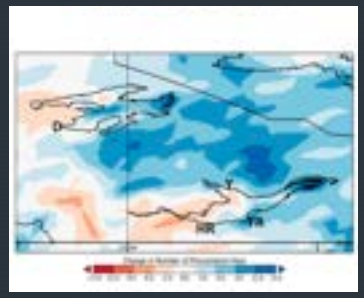
On the Intersection of Climate and Meteorology:
Local, Regional, & Global Perspectives on Severe Weather & Extreme Conditions

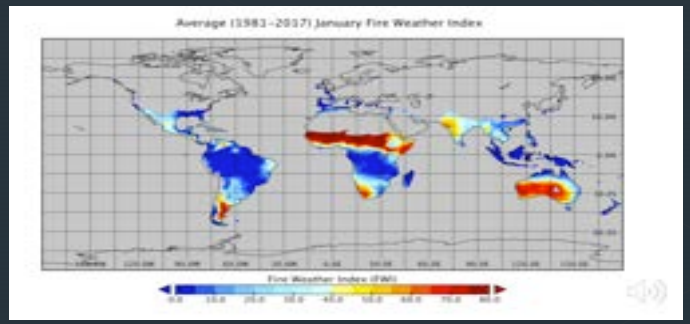
Dr. Janine A. Baijnath-Rodino
Director of Meteorology
&
Adjunct Assistant Professor
Office: MS - 7236
janinebr@g.ucla.edu

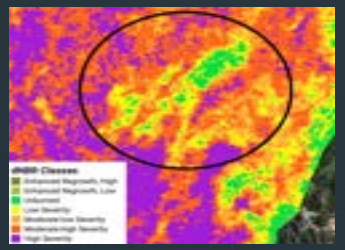
SCAN ME

Website:
https://janineannb.wixsite.com/jabr

1. Identifying the roles of surface-atmospheric hydrometeorological processes in extreme weather
2. Quantifying risk and livelihood vulnerability from natural hazards
3. Determining effective solutions and mitigation strategies for wildland fires
4. Science Communication







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Prof. Gang Chen

Atmospheric and Climate Dynamics Group

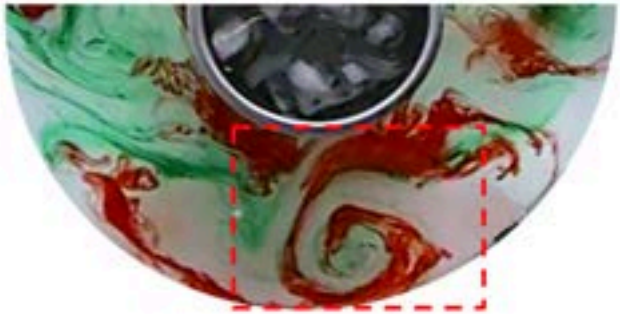
Lead: Prof Gang Chen

Email: gchenpu@ucla.edu

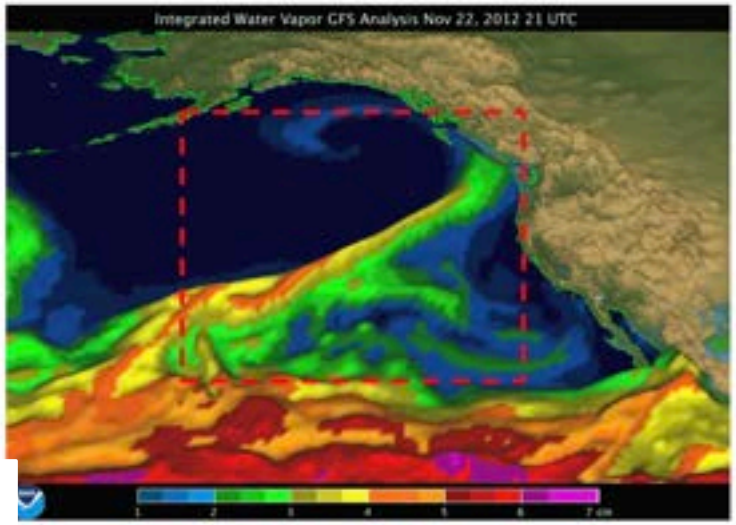
Office: Math Sciences 7149

Project: weather and climate extremes

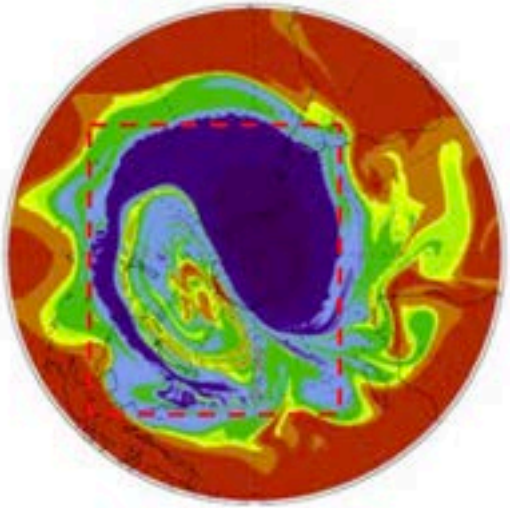
Rotating tank



Atmospheric rivers



Polar vortex



Prof. Karen Mckinnon

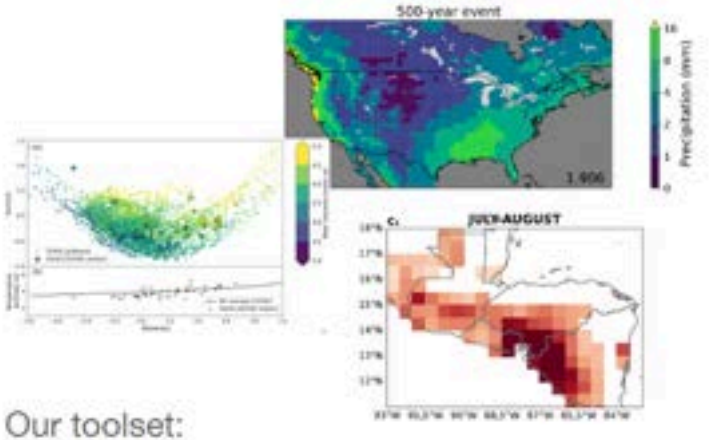
CLIMATE VARIABILITY, CLIMATE CHANGE

THE MCKINNON GROUP

STATISTICS, ATMOSPHERIC AND OCEANIC SCIENCES, INSTITUTE OF THE ENVIRONMENT

UNIVERSITY OF CALIFORNIA, LOS ANGELES

- What is the regional structure of climate change? And can we reduce uncertainty in future projections?
- How does climate manifest for temperature, precipitation, and humidity extremes?
- How can we separate internal variability from human-caused climate change in the observations?
- How do land/atmosphere interactions influence the near-surface climate over land, and the converse?



Our toolset:
- Code (typically Python)
- Climate models
- Physics, math, and conceptual models
- Data across scales, from in situ to satellite

kmckinnon@ucla.edu
Math Sci 8967 (one floor up!)
https://karenamckinnon.github.io/

Prof. Yue Dong

Large-scale coupled climate dynamics Group

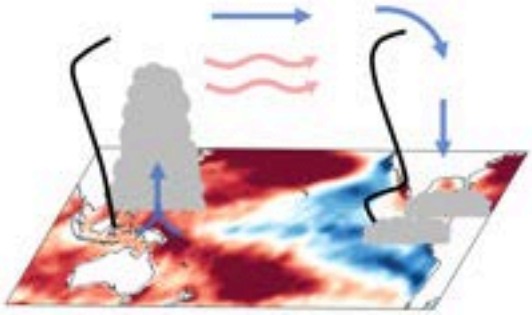
Prof. Yue Dong
Email: ydong@atmos.ucla.edu
https://sites.google.com/view/yuedong-atmos

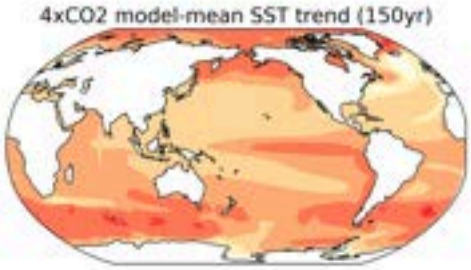
We use climate models and observations to build theories for understanding how the climate system works and how it changes

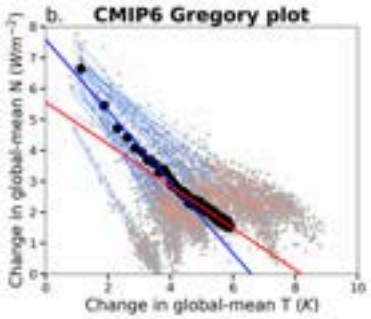
How the **atmosphere** is coupled with **oceans** & **cryosphere**

How the **tropical climate** interacts with the **polar climate**

How the coupled dynamics modulate **climate feedbacks** & **climate sensitivity**







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Prof. Michael Ghil
Theoretical Climate Dynamics Group

LORA: a snapshot of the randomly driven Lorenz (1963) convection model's "random attractor"

Key Questions:

- How do time-dependent forcings, anthropogenic & natural, affect the functioning of the climate system?
- How does this functioning affect socio-economic processes?

Current Research Interests: Atmospheric & Oceanic Sciences, Boolean Delay Equations on Networks, Celestial Mechanics, Climate Dynamics, Data Assimilation, Dynamical & Complex Systems Theory, Estimation Theory, Extreme Events & Prediction, Geophysical Fluid Dynamics, Macroeconomics, Numerical & Statistical Methods, Remote Sensing & Applications, Solid Earth Dynamics

Contact
E-mail: ghil@atmos.ucla.edu, ghil@lmd.ipsl.fr
Website: https://dept.atmos.ucla.edu/tcd/people/michael-ghil, https://en.wikipedia.org/wiki/Michael_Ghil

James C. McWilliams
Slichter Professor of Earth Sciences
jcm@atmos.ucla.edu

Geophysical fluid dynamics

Turbulence

Oceanic circulation and biogeochemistry

Climate variability

Computational simulation

Prof. Jacob Bortnik

Understanding the physics of space weather using data, numerical modeling, lab experiments and machine learning techniques

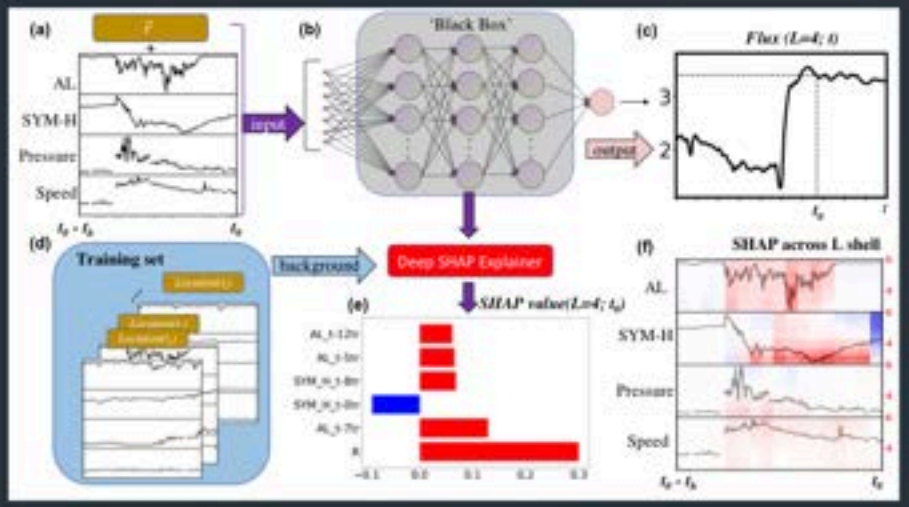
Prof. Jacob Bortnik
Professor
Department Chair
Faculty director of the UCLA SPACE Institute

Drop by: MS 7228
Email:
jbortnik@atmos.ucla.edu

Web:
https://atmos.ucla.edu/space/

We aim to:

1. To understand and predict the complex physical processes that control the space environment, where spacecraft and astronauts often face hazardous radiation conditions (aka. Space weather)
2. We use a variety of 'traditional' approaches (often in combination), including analyzing data from current and past spacecraft missions, we run fundamental plasma physics experiments at UCLA's Large Plasma Device, and we perform large-scale computational simulations.
3. We use and explore novel approach such as Machine Learning and Artificial Intelligence to predict, probe, and understand physical systems, often inventing new approaches along the way to aid in insight discovery.



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