Participation guide for the Climate Dynamics group at UC Santa Cruz

Overview

Purpose of this guide
This document outlines general expectations and guidelines for participating in the Climate Dynamics group. This guide is a living document that will be shaped by feedback from all group members. We also hope this document will provide useful insight to prospective group members as they weigh their options.

Mission Statement
Our group seeks seek to understand how atmospheric circulations, ocean interactions, radiative transfer, and land surface processes control regional and global climate. To carry out our investigations, we use a combination of hierarchical numerical modeling, theory, and observational analyses. Theories addressed at understanding large-scale climate dynamics help us interpret changes in past, present, and future climates. A core part of our mission is to recruit and train early career scientists. We support members who aspire to apply their skills in various realms, including academic research, education, science communication, and public policy.

Commitment to a respectful, inclusive, and harassment-free work environment
This group is committed to providing a supportive and inclusive work environment where all members can thrive and realize their full potential. All members are expected to be familiar with the values and expectations outlined in the Earth and Planetary Sciences Principles of Community (https://eps.ucsc.edu/about/diversity/principles-of-community.html). In pursuit of these ideals, we will employ several proactive measures, including training sessions, dedicated group discussions, and the implementation of clear communication channels for providing feedback and reporting problematic behavior.

University resources
EPS Graduate Handbook - https://eps.ucsc.edu/graduate/grad-handbook.html
Academic Calendar - https://registrar.ucsc.edu/calendar/academiccalendar.html
Graduate student and postdoc salary table - https://apo.ucsc.edu/compensation/salary-scales/index.html

Expectations and responsibilities

Below is a brief overview of what is expected from each group member. This non-exhaustive summary establishes a baseline for individual conduct and responsibilities.

Everyone
- Cultivate an inclusive and supportive work environment
- Produce transparent and reproducible research
- Be receptive to feedback and criticism

Faculty advisor (i.e., Nicole)
- Define the scope and direction of the group's research
- Secure resources to conduct research
- Allot time to meet with each group member regularly
- Provide timely feedback on research progress
- Guide graduate students through their matriculation process
- Organize group meetings and activities
- Provide access to professional network
- Provide letters of reference

As a faculty member, Nicole is also expected to
- Teach and develop courses
- Serve the university and the broader scientific community

Graduate students
- Understand degree requirements and maintain good academic standing
- Work with faculty advisor to develop a research plan
- Prioritize research and thesis work
- Be organized and develop a sustainable time management system
- Be in regular communication with faculty advisor
- Be proactive in seeking advice and guidance
- Take initiative and develop independence as a scientist
- Participate in group meetings
- Attend departmental seminars
- Apply for external funding
- Prepare and submit manuscripts for publication
- Present research at conferences

Postdocs
- Continue to develop independence as a scientist
- Conduct research and publish papers
- Prioritize collaborative research with faculty advisor
- Be in regular communication with the group and faculty advisor
- Participate in group meetings
- Lend research expertise to the group
- Provide mentorship to more junior group members
- Be proactive in seeking advice and guidance

Undergraduate students
- Be eager to learn
- Ask lots of questions
- Prioritize coursework and degree requirements

PhD program timeline and milestones

The EPS Grad Handbook is a valuable resource for all students in the department. Below is a description of norms within our group.

Year 1
Coursework[1]; select research topic and conduct exploratory research (read lots of papers with an eye for interesting research questions); apply for graduate fellowships[2].

Year 2
Coursework; complete first research project; write manuscript draft.

Year 3
Submit manuscript to a peer-reviewed journal; select a qualifying exam committee; begin second research project; write qualifying exam proposal[3]; present research at a scientific conference; take qualifying exam.

Year 4
Continue second research project; present research at a conference; write manuscript and submit to a peer-reviewed journal; begin third research project.

Year 5
Continue third research project; present research at a conference; write manuscript and submit to a peer-reviewed journal; write dissertation[4]; defend dissertation.

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[1] Graduate school represents a transition to research-based work and away from the course-based work typical of undergraduate education. Therefore, course selection should complement individual research and career goals. A meeting will occur in advance of fall quarter in which the student will discuss their course plan with Nicole and the graduate program advisors.

[2] While PhD students are admitted with guaranteed funding for 5 years, there are a number of advantages to applying for fellowships. External funding leverages group resources and gives the awardee a greater degree of intellectual autonomy. Grant writing is also an important professional skill for an academic career and helps refine research ideas and plans.

[3] The qualifying exam proposal is comprised of five chapters: an introduction describing the overall goals and objectives of the dissertation research, a complete manuscript of the first research project, a proposal of the second research project including preliminary results, a proposal of the third research project, and a summary including a timeline and deliverables. A draft of the proposal must be submitted to your primary advisor one month before the qualifying exam, and a revised draft of your proposal should be submitted to your committee two weeks before the qualifying exam.

[4] The PhD dissertation is a scholarly contribution to knowledge, which embodies the results of original and creative effort ty the student. It is comprised of approximately 5 chapters: an introduction, at least three chapters each representing a distinct research project, and a conclusion.

Further guidance

These additional guidance are intended for graduate students and postdocs who are primarily affiliated with our group.

Individual meetings

At the beginning of each quarter, Nicole will schedule weekly meetings with each group member. These are opportunities to discuss research progress, course selection, professional development, and anything pertinent to your experience at UC Santa Cruz. Group members are welcome to schedule additional meetings as needed.

Group meetings

We currently have group meetings weekly. These are intended to be informal, low-stakes opportunities for everyone to share and receive feedback on their work and to discuss the literature. Everyone is expected to share a brief update on their work and participate in the discussion.

Additional modes of communication

Slack is the preferred medium for informal discussions. Official correspondence (e.g., regarding travel reimbursements and scheduling of annual reviews) should be sent via email.

Presence on campus

All group members are encouraged to have a regular presence on campus. Working in the company of others can be a catalyst for generating great ideas and generally makes doing research more enjoyable. Each group member is free to create a work schedule that fits with their obligations. Showing up to campus for a few hours each day or every other day is fine; being absent for a week or more without notice is unacceptable (see note below on taking vacations). Remote work may be accommodated on a limited basis, provided these plans are discussed with Nicole in advance. Since UC Santa Cruz has strict policies governing remote work, there is no guarantee every request will be approved.

Breaks and vacations

Conducting research can be a mentally exhausting and emotionally draining experience. While it is essential to work hard and push your limits, it is equally important to allot time to relax and rejuvenate. Without timely breaks for recovery, it is difficult (arguably impossible) to sustain a productive and rewarding career in our field. Everyone should allocate breaks into their schedule and take full advantage of university holidays.

University holidays occur on a handful of days throughout the year (e.g., Labor Day, Veterans Day, Thanksgiving Holidays), and they are *not* synonymous with breaks from instruction. Group members are expected to work during instructional breaks, excepting university holidays, unless they have made prior arrangements to take vacation.

Group members are encouraged to take several weeks of vacation each year and should ideally inform Nicole at least two weeks in advance. However, we understand that the need to do this may arise unexpectedly, in which case a courtesy notification will suffice.

Conference travel

Scientific conferences are valuable opportunities to share our work, hone our communication skills, and network with colleagues outside of UC Santa Cruz. Group members will receive support to attend at least one conference per year if presenting; this support will cover expenses directly related to the trip (e.g., flights, transportation, lodging, food, and registration fees). Expenses are reimbursed post travel and all receipts must be presented.

The major meetings for our field include the annual AGU Fall meeting, the AMS Conference on Atmospheric and Oceanic Fluid Dynamics, and the CFMIP Meeting on Clouds, Circulation, Precipitation,

and Climate Sensitivity. Please keep an eye out for smaller conferences, workshops, and ad hoc meetings that often provide more worthwhile experiences. Anyone wishing to travel a conference should review the university's travel and reimbursement policies at https://financial.ucsc.edu/pages/travel_process.aspx.

Laptops and workstations
In general, group members are not expected to pay for any resource that is essential to the fulfillment of their work. Graduate students and postdocs are entitled to a laptop or desktop workstation, and related accessories. Any equipment purchased using the group's research funds is owned by university and should be treated as such. Each desk in the lab comes equipped with an ergonomic Office Master task chair (model YS88). The following video demonstrates the available adjustments https://youtu.be/h__HSoNCnNU.

Computational resources
Our group has access to lux, an NSF-funded High Performance Computing (HPC) system at UC Santa Cruz. We also maintain a small Linux server, maddox, for exclusive use by our group. The maddox system features 2x 18-core Intel XEON E5-2697V4 CPUs, 256GB RAM, and 2x 200GB SSD drives. It also features a 16x 6TB RAID storage system configured for 58TB of usable space. In general, personal computers should be used for routine work that is not computationally demanding. Computationally intensive tasks should be handled on lux (or NCAR or DOE systems). Moderately intensive tasks may be handled on maddox. Accessing HPC systems requires the campus VPN (https://its.ucsc.edu/vpn/index.html).

The official lux documentation is available at https://lux-ucsc.readthedocs.io/. The documentation provides valuable information for using the system, including the Slurm workload manager. Particular attention should be paid to the policies for login node use: https://lux-ucsc.readthedocs.io/en/latest/policies.html#login-node-usage.

Outreach and service
Our group supports and encourages participation in any service activity that advances the interests of our scientific community. Such activities may include scientific outreach, serving as a student-rep on a department committee, and contributing to groups that advance equity and inclusion. We believe participation in these activities is essential to maintaining a healthy scientific enterprise, and we aim recognize individuals who make the effort to do so. As with any voluntary commitment, group members should use discretion when allocating time for these activities and ensure that their involvement does not adversely affect their other academic obligations.

Publications and authorship
When it is time to publish the results of a project, the individual who conducted the majority of the research is expected to be the lead author. The lead author is responsible for drafting the manuscript and guiding it through the peer-review process. All manuscripts should be prepared in LaTeX; the University offers free software licenses for Overleaf (https://www.overleaf.com/). As the faculty advisor, Nicole will oversee this process and generally cover the publication expenses.

Our policy is that anyone who substantially contributes to the conceptualization, design, or execution of the project should be invited to be a coauthor. Further, any individual who may offer significant intellectual input on the analysis, interpretation, and presentation of the results may be invited to be a coauthor. These criteria are only starting starting points for these discussions, and there are many nuances to consider. We recommend broaching these conversations with the relevant parties as early as possible.

Since coauthorship implies an endorsement of the substance and quality of the manuscript, each coauthor is expected to review and provide feedback on the manuscript. In turn, the lead author must carefully consider and address their suggestions. As with any collaborative project, there will be disagreements and lively debates; learning how to navigate these interpersonal disagreements is part of the educational

process. Nicole is available to provide counsel, mediate conflict, and run interference if another senior scientist is involved.

Group members are supported in their involvement in additional collaborations, however, graduate students should always prioritize their thesis work and postdocs should prioritize their research with the faculty advisor.

Documenting research
A core mission of our group is to conduct impactful scientific research that is transparent and reproducible. Any research paper published by our group should include sufficient detail that an informed reader may follow the methodology and recreate the paper's findings. Ideally, all relevant numerical code and processed data should be uploaded to publicly accessible repository. Additionally, everyone is encouraged to maintain a regular log of their research progress, the frequency and level of detail to which this is done is left to individual discretion.

Since much of our work is numerical and involves writing many lines of code, it is essential to keep these files organized and well-documented. We should avoid relying on a messy code that "works" but is impossible to decipher or debug.

Letters of reference
Nicole is available to provide a letter of reference for any group member. If you are requesting a letter for the first time, please provide one month of notice—the earlier the better. If Nicole has already written a letter for you, then a one week notice should suffice.

Reporting problematic behavior
All group members must abide by our commitment to creating an inclusive and harassment-free work environment. This involves being aware of how our actions may impact others and being vigilant when these values are not upheld. Anyone who witnesses or experiences harmful behavior is encouraged to report the incident to Nicole, the Department Chair, or the Graduate Advisor. Please note that, as a faculty member, Nicole must report all incidents involving sexual harassment, misconduct, or assault to the University's Title IX Office. Reporting options are described in more detail at https://eps.ucsc.edu/about/diversity/reporting-options.html.