Welcome to the FSU Meteorology Graduate Program Virtual Open House!

Department of Earth, Ocean and Atmospheric Science
December 2, 2023
A introduction to the EOAS Department & Meteorology program at FSU & overview of graduate student life here in Tallahassee

1. Welcome from the EOAS Department Chair – Prof. Bob Hart

2. EOAS Department and Meteorology Graduate Program Overview – Prof. Allison Wing
   • Center for Ocean-Atmospheric Prediction Studies (COAPS) - Prof. Mark Bourassa

3. Meteorology Faculty Member Introductions

4. Graduate Student Life: Christopher Grover, Joanna Rodgers, Jarrett Starr

5. Admissions and Assistantships – Prof. Zhaohua Wu

6. Q & A
At EOAS we continuously work to create an inclusive department that fully reflects the diverse community we serve. We seek to accomplish this by recruiting a diverse faculty, staff, and student body and promoting and strengthening under-represented groups within EOAS. Here, we build on an inclusive culture in which difference is welcomed and valued. We embrace the responsibility of providing and nurturing an affirming climate that supports and celebrates individual identities across a broad spectrum while ensuring equitable treatment. We strongly believe that different backgrounds, perspectives and experiences drive creativity and innovation, and deliver better results. At EOAS everyone is welcome!
Areas of research include:
- Synoptic & dynamic meteorology
- Mesoscale meteorology
- Tropical meteorology
- Hurricanes
- Atmospheric chemistry
- Climate variability and change
- Remote sensing
- Air quality
- Air-sea interaction

…and more!

16 Faculty
22 Master’s Students
18 PhD Students
Our graduate students come from backgrounds in
• Meteorology/atmospheric science
• Environmental science
• Physics
• Math
• Civil engineering
• And other fields!

Our graduate students take courses in
• Atmospheric dynamics
• Synoptic meteorology
• Climate
• Atmospheric physics
• Technical electives

And can choose from electives…
• Large-scale atmospheric circulations
• Waves and instabilities
• Linking weather and climate
• Dynamics of large-scale climate variability
• Mesoscale meteorology
• Tropical meteorology
• Marine meteorology
• Regional hydroclimatolology
• Fundamentals of climate and global dynamics
• Extreme weather in a warming climate
• Atmospheric composition, chemistry, and climate
• Paleoclimate data, models, and theory
• Radiative transfer
• Cloud physics
• Satellite remote sensing
• Global biogeochemical cycles and global change
• Atmospheric convection
• Tropical rainfall
• Physics of the air-sea boundary layer
• Applied time series analysis
• Data analysis
• Dynamical weather prediction
Meteorology Graduate Program

Recent seminar topics include:

- “Anthropogenically-driven increases in extreme fire weather conditions and subsequent extreme precipitation events”
- “Exploring explainable machine learning for detecting changes in climate”
- “The mystery of observed and simulated precipitation trends in Southeastern South America since the early 20th century”
- “Extreme weather risks and decisions in society”
- “Understanding Weather Hazards in the Northeast United States Through Analysis of Cyclone Tracks.”
- “How and Why Does Tropical Cyclone Precipitation Respond to Climate Change?”
- “Guiding Principles for Data Visualization for Analysis”
- “Climate consequences of a hydrogen economy: from science to action”

In addition to classes, students

- Conduct research
- Attend meteorology seminars by visiting experts and FSU faculty & students
- Attend EOAS colloquia
- Meet with visiting speakers
- Participate in student activities

2023 Werner A. Baum Lecture

Renowned climate scientist Kerry Emanuel, Ph.D., to speak on climatology of severe thunderstorms

Friday, Dec. 1 | 3-4 p.m.
EOAS Building | Room 1050
Our recent MS graduates have gone on to...
- National Weather Service
- NCEP Environmental Modeling Center
- Meteorologist for Commodities/Energy Trader
- Meteorology engineer/consultant for defense contractor
- Air quality dispersion modeler for environmental consulting company
- Catastrophe/risk modeler
- PhD programs

Our recent PhD graduates have gone on to scientific research positions at...
- NOAA Hurricane Research Division
- Storm Prediction Center
- Naval Research Lab
- Northern Gulf Institute
- Woods Hole Oceanographic Institution
- Other academic institutions
Virtual Building Tour
Department/Campus Resources

MAP ROOM: POWELL WEATHER OBSERVATORY
About COAPS

COAPS is a center of excellence performing interdisciplinary research in ocean-atmosphere-land-ice interactions to increase our understanding of the physical, social, and economic consequences of climate variability.

Established at the Florida State University in 1996 by the Florida Board of Regents.

Core objectives include:

• Producing peer-reviewed scientific research.
• Graduating well-qualified students in meteorology, oceanography, statistics, and the computer and information sciences.
• Providing high-quality data products and services to the public, private, and research communities.
COAPS has 59 people working on research grants with expenditures in excess of $5 M per year. Current personnel include:

- 8 Teaching Faculty (also part of EOAS and Computational Science)
- 18 Research Scientists and Post-Docs
- 18 Graduate Students
- 2 Undergraduate Students
- 4 Administrative Personnel

For people interested in interdisciplinary Earth Systems Science there are a lot of opportunities to draw on diverse expertise (similar to EOAS), but with more full-time researchers to work with.

**Long Term Goals**

- Maintain a Leadership Role in interdisciplinary ocean-atmospheric research
- Educate the next generation of earth system scientists
- Increase our Collaboration with universities, government agencies, and members of the private sector
Faculty Introductions
Alyssa Atwood: Tropical paleoclimate

Graduate Classes:
OCC 5930: Paleoclimate Data, Models, and Theory (grad)
OCC 5930: EOAS Professional Development Seminar (grad)
MET 6155: Fundamentals of Climate & Global Change (grad)

Undergrad Classes:
MET 3103C: Climate Change Science (undergrad)

Research areas:
- Paleoclimate
- Climate dynamics & modeling
- Coral geochemistry

Contact:
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EOAS 4017
850-644-2770
Diamond group: Clouds, aerosols, & climate

Observed “natural experiment” from pollution regulations

High resolution modeling of smoke-cloud interactions

- Cloud water
- Smoke
- Rain water
Dr. Sharon Nicholson

- Tropical meteorology
- African weather and climate
Prof. Allison A. Wing  
Organization of tropical convection: Implications for climate and for hurricane development

And how this clustering affects climate variability by changing the flow of energy through the atmosphere.

We study what controls how tropical clouds clump together...

Interactions between clouds, infrared cooling/heating, and air circulation help the clouds cluster.

...accelerate hurricane development.

We use cloud-resolving models, satellite observations, and hurricane hunter aircraft data to study how these “cloud-radiative feedbacks”...
Zhaohua Wu’s Research Interests

**Searching for Physical Origins of the Annual Cycles of SAT**

**Developing Innovative Data Analysis Methods**

**Finding Laws of Waves Propagation in a Varying Medium**

\[
\frac{\partial A}{\partial x} = \frac{1}{2(c_0 + U)} \frac{\partial U}{\partial x} A
\]

**Unlocking How Rapid Weather Variability Impacts Flu Epidemic**

**Diagnosing Spatiotemporally Local Tropical Waves**

**Building Weather/Climate Model Components**
Faculty Introductions

Dr. Alyssa Atwood
- Tropical climate variability and change
- Paleoclimate data, models & theory
- Isotope geochemistry

Dr. Mark Bourassa
- Air-sea interaction and observing systems
- Remote sensing
- Boundary layer meteorology
- Tropical meteorology

Dr. Ming Cai
- Dynamics of global mass circulation
- Climate change
- Stratosphere-troposphere coupling

Dr. Jeff Chagnon
- Mid-latitude dynamics
- Numerical modeling
Faculty Introductions

Dr. Michael Diamond
- Clouds, aerosol, and precipitation
- Climate Change
- Earth’s albedo
- Marine cloud brightening

Dr. Henry Fuelberg
- Synoptic meteorology
- Meso-meteorology
- Lightning

Dr. Bob Hart
- Synoptic-dynamic meteorology
- Tropical cyclones
- Statistical and numerical weather prediction
- Tropical-extratropical interactions

Dr. Chris Holmes
- Atmospheric chemistry
- Climate change
- Atmosphere-surface interactions
- Air quality
- Fires & smoke
Faculty Introductions

Dr. Guosheng Liu
• Radiative transfer
• Satellite remote sensing and applications to forecasting and climate research

Dr. Vasu Misra
• Climate variability and predictability
• Tropical meteorology
• Monsoons

Dr. Chelsea Nam
• Tropical cyclones
• Radar meteorology
• Mesoscale modeling
• Extreme weather and risk

Dr. Sharon Nicholson
• Tropical meteorology
• African weather and climate
Faculty Introductions

Dr. Rhys Parfitt
- Marine meteorology
- Mid-latitude climate variability
- Socioeconomic impacts of weather

Dr. Philip Sura
- Stochastic-dynamical understanding of extreme climate events

Dr. Allison Wing
- Tropical cyclones
- Tropical convection and climate

Dr. Zhaohua Wu
- Atmospheric and climate dynamics
- Development of mathematical/physical analysis methods
GRADUATE STUDENT SOCIAL LIFE

- Football Games
- Bowling at the Student Union
- Graduate Students in Love Building during Hurricane Michael
- Graduate Students at 5K
- Student Union
CAMPUS ACTIVITIES

STUDENT UNION

FOOTBALL GAMES
Admissions & Assistantships

Graduate Committee Chair
Prof. Zhaohua Wu

Graduate Academic Coordinator
Jimmy Pastrano
Modern Meteorology & Atmospheric Science

- A branch of study for understanding evolving weather and its predictability, climate and global change, the circulation of the atmosphere relating to weather systems and their impact on the Earth, air quality, and other atmospheric processes that affect us.

- The means of study include but are not limited to collecting data, analyzing data, synthesizing findings and proposing theories, and modeling; and therefore involve high levels of mathematical techniques and physical understanding.
Admission Math Requirements

• Three semesters of calculus (Calculus I, II, III)
  • Limits, differential calculus (in one variable)
  • Integral calculus in one variable
  • Multivariate calculus, vector calculus.

• Ordinary differential equations
Admission Phys Requirements

• Two semesters of calculus-based physics (Physics I and II with labs)
  • Mechanics (300+ years old)
  • Electromagnetics (150+ years old)
  • Contemporary physics (mostly about 100 years old)

You see, you don’t NEED an undergrad degree in MET/atmos. Just need the math/phys background
Application Deadline: **January 15**

- Curriculum Vitae/Resume
- Personal Statement
- Official Transcripts
- Reference Letters
- Other Supplementary or Required Materials
  - Research Papers
  - Proof of Level of English (for Non-native speakers)
  - GRE Score (For Ph.D. Student only)
- Finally, fill out the application form and upload the files
What We Value

• **Main evaluation criteria – what we consider**
  
  • Non-Cognitive Competencies
    • Letters of recommendation, statement of interest, and fit within the program
  
  • Research Potential
    • Quantity/quality of prior research, evidence of interest, and fit
  
  • Academic Preparation
    • Taken required courses or ability to take required courses/to learn required skills
  
  • Academic Performance
    • GPA and progression over time

• **Additional evaluation criteria (subtle and subjective)**
  
  • Communication skills, Leadership, Willingness to serve others…
Assistantships

We offer funded assistantships:

• Teaching Assistant: classroom instruction, lab assistance, grading
  • 12-month ½ TA (some): 20 hours/week (fall, spring, summer)
  • 9-month ½ TA (typical): 20 hours/week (fall, spring)
  • 9-month ¼ TA (some): 10 hours/week (fall, spring)

• Research Assistant: working on research project, typically grant-funded
  • Tied to specific professors with funding

*Regardless of type of funding, all students are expected to complete a research project*
M.S. vs. Ph.D.

- With a BS/BA degree
  - Most students enter as MS students.
  - Exceptional candidates can enter Ph.D. program
- With an MS degree in meteorology or a close field
  - Most students enter as Ph.D. students.
- Offer Types
  - MS can get TA or RA offers
  - Ph.D. must have an RA offer from a professor with funding
  - Applying for MS gives more flexibility/a better chance of getting funding
- Switching from MS to PhD
  - Possible, depending on the availability of funding and agreement from a professor
Approximate Timeline

- **Jan 16**: application evaluation starts
- **~Feb 15**: the first round of offers is made by the university
- **April 15**: the decision (accept or decline) deadline
- Depending on whether students accept offers or other funding emerges, we may or may not have additional rounds of offers later in the spring. In these cases, the decision deadline will be modified accordingly
Frequently Asked Questions

- **Q1**: Do you offer an application fee waiver?
  - The application fee is charged by the Admissions Office. They do not offer a waiver.
- **Q2**: Do I need the support of a faculty member before applying?
  - Communication with faculty is encouraged but not required; may help to secure an RA.
- **Q3**: When I apply for admissions, do I need to submit a separate application for department funding?
  - No.
- **Q4**: Does admission look different for domestic vs international applications?
  - No. Admissions will be rigorous for each applicant.
- **Q5**: Is a GRE required?
  - At the MS level, the university has waived the GRE for a limited time. If you took the exam and wish to report it, you may.
  - At the Ph.D. level, the GRE is required. You may apply for a waiver if you meet specific criteria.
Frequently Asked Questions

• **Q6**: Do all the MS programs require a thesis?
  • All MET MS students are expected to complete a research project.
  • The default expectation is that all MS students follow the thesis track, but a comprehensive exam track is also available.

• **Q7**: Do all recommendation letters have to be from instructors?
  • No, but strongly encouraged that these letters are from science instructors or research mentors. Additional letters from supervisors are acceptable.

• **Q8**: Will incomplete files be reviewed?
  • No. All applications must be completed by the deadline. We take the full application into consideration

Graduate Committee Chair: Prof. Zhaohua Wu zwu@fsu.edu
Graduate Academic Coordinator: Jimmy Pastrano jpastrano@fsu.edu
We hope this information session has provided a useful overview of the EOAS department, the Meteorology program, and life as a graduate student here in Tallahassee!

A recording of the presentations will be available at https://www.eoas.fsu.edu

We have time now for questions, but you can always contact us directly as well:

Graduate Committee Chair: Prof. Zhaohua Wu zwu@fsu.edu
Graduate Academic Coordinator: Jimmy Pastrano jpastrano@fsu.edu

- General Questions from Attendees
- Breakout Rooms for more Specific Questions:
  - Individual Faculty
  - Jimmy Pastrano
  - Graduate Students (Christopher Grover, Joanna Rodgers, Jarrett Starr)

Thank you for attending our virtual open house!