Advanced Observations for Lower Atmospheric Research

Collecting and applying state-of-the-art observations to research

BLENDED:
MONDAYS 3-4:15PM IN PERSON
ASYNCHRONOUS ONLINE

NWC5302
CANVAS

Instructor Team

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Boundary layer, near- and pre-storm environments, ground-based profiling

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THE ATMOSPHERE IS OUR LABORATORY

No matter the specific focus, atmospheric research nearly always requires the use of meteorological observations. The researcher benefits from understanding the theory and methods behind observation collection and important steps in data processing and application. This course will examine the observation and operation principles behind a variety of research-grade instruments There will be no exams, with focus instead on group instruction, guest lectures, instrument demonstrations, and data-focused exercises and projects. Material presented will focus on modern and state-of-the-art instruments applied to current research problems. Students will use Python for processing, analysis, and visualization of real observed datasets, helping prepare students for research careers.

What's Required?

Undergrads need to have credit METR2213 and METR2613. Grad students need to be enrolled in or have credit for METR5004. If any student (METR or otherwise) is interested in the course, these pre-reqs can be waived with instructor permission!

There is no textbook for the course. Readings will come from scientific literature, and we will cover how to read these articles.

We will work in Python for most homework assignments and for project analysis and recommend the free anaconda distribution. We understand that students may come into this class with diverse coding backgrounds. This should not be a barrier to students, and we aim to meet all students where they are in their coding skills and develop them accordingly.

What are you going to learn?

After completion of this course, students will be familiar with several research-grade observation platforms and have **experience synthesizing observations and information to address a research problem**. Students will have also gained important experiences interrogating and quality assuring observed datasets, which should be transferable beyond the platforms covered and even to other fields. **Students entering research or data analysis careers will be more prepared to work with modern, state-of-the-art observations**.

How will you be graded?

Since there are no exams in this course, students will be graded on homework and a semester project.

A: 90% and up

B: 80% – 89%

C: 70% – 79%

D: 60% – 69%

F: 59% and below

60% of the total grade comes from the homework assignments, which with 4 assignments comes to 15% per homework.

40% of the total grade comes from the final project, which includes a proposal, a progress report, and a final paper.

What will we do?

Most homework assignments and the semester projects will use **real, observed datasets collected by state-of-the-art observation platforms**. The instructor team will use their respective expertise to advise students on using these datasets and completing relevant research tasks. In addition to course sessions, the teaching team plans to **hold optional sessions covering tangential topics of interest such as coding, writing, presenting, and more**.

Please see full syllabus for details, schedule, official policies, and important statements.