

ASEN 6519 Data Assimilation and Inverse Methods for Earth and Geospace Observations

Lecture: T/TH 12:30-1:45pm, ECCR 150

Zoom meeting ID: 682-295-278

Office Hour: T/TH 1:45-2:45pm or by appointment

Webpage: Canvas (<https://canvas.colorado.edu>)

Instructor: Prof. Tomoko Matsuo

Office: ECOT 614

E-mail: tomoko.matsuo@colorado.edu

(Note that the Canvas Conversations communication tool is not used)

Texts

All the reading material required for this course will be provided through the Canvas course webpage. Suggested (not required) text books on the topics covered in this course include:

- < Statistical methods in the atmospheric sciences, Daniel Wilks (2005) - *eBook at CU library*
- < Inverse methods for atmospheric sounding: theory and practice, Clive D. Rodgers (2000) - *eBook at CU library*
- < Atmospheric modeling, data assimilation and prediction, Eugenia Kalnay (2003) - *on reserve in CU library*
- < Atmospheric data analysis, Roger Daley (2007) - *on reserve in CU library*
- < Data assimilation: the ensemble Kalman filter, Arne Eide and Ingeborg Isaksen, (2007, 2009) - *eBook at CU library*
- < Inverse problem theory and methods for geophysical parameter estimation, Albert Tarantola (2004) - *eBook at CU library*

You can access these books as eBook from the Canvas course webpage or from the CU Gemmill Library of Engineering, Math and Physics.

Community Data Assimilation Software

Some of the most commonly used Community Data Assimilation Software (CDA) for researchers in the Earth and Space Sciences can be found at:

- < NCAR DART, <http://www.dart.ccar.edu/DAReS/DART/>
- < DTC GSI, <http://www.dtcenter.org/com-GSI/users/>
- < DTC EnKF, <http://www.dtcenter.org/EnKF/users/index.php>

Class Format

The course will involve weekly lectures and group discussion on the course content outlined above. Distance learning students are asked to participate in discussion via Canvas discussions, Zoom chat, and/or e-mails. Homework assignments will provide opportunities to apply the statistical principles to realistic examples. Brief feedback about your learning experience and self-assessment will be requested weekly, and will be discussed in the following class. A midterm take-home exam will be given to assess students' understanding on the fundamentals and to apply their knowledge to solve an assigned problem as a small group. A final individual project will be required. Final oral and written reports of each project will be evaluated in terms of the soundness of the problem formulation, the quality and effort of research and analysis, and the

This course requires the use of the Zoom conferencing tool, which is currently not accessible to users using assistive technology. **If you use assistive technology to access the course material, please contact me immediately to discuss.** For more information on Zoom, please visit <http://www.colorado.edu/oit/services/conferencing-services/web-conferencing-zoom>

Disabilities

