

Topics in Atmospheric Sciences: Cloud Microphysics

Spring Semester 2020

Lecturer

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Assistant (grading)

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Textbooks and References

1. A Short Course in Cloud Physics, 3rd edition, 1989, R. R. Rogers and M. K. Yau, Pergamon Press, 293 pp.
2. An Introduction to Clouds, 2016, U. Lohmann, F. Lüönd, and F. Mahrt, Cambridge University Press, 391 pp.
3. Cloud Dynamics, 2nd edition, 2014, R. A. Houze, Jr., Academic Press, 432 pp.
4. Physics and Chemistry of Clouds, D. Lamb and J. Verlinde, 2011, Cambridge University Press, 584 pp.
5. Microphysics of Clouds and Precipitation, 1997, H. R. Pruppacher and J. D. Klett, Kluwer Academic Publishers, 954 pp.
6. Human Impacts on Weather and Climate, 1995, W. R. Cotton and R. A. Pielke, Cambridge University Press, 288 pp.
7. Papers presented at 11th Symposium on Aerosol-Cloud-Climate Interactions, 2019, American Meteorological Society.
8. Classical and recent journal articles on cloud microphysics schemes

Grading

homework: 50%

presentation: 50%

Lecture/Presentation Contents

Thermodynamics of dry and moist air
Mixing and convection
Observed properties of clouds
Microphysics of warm clouds
Microphysics of cold clouds
Weather radar
Precipitation processes
Weather modification
Cloud modeling: bulk and bin microphysics
Aerosol-cloud- weather (climate) interactions