

Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER I – 2002–03

ATMOS 497: Special Topics in Atmospheric Sciences

Section K: Clouds and Climate

Call number: 00945

Instructor: Prof. Greg McFarquhar, 211 Atmospheric Science Bldg., 265-5458

E-mail: mcfarq@atmos.uiuc.edu

Room and Time: 109 Atmospheric Science Bldg., 1:00-2:15 p.m. Tu Th

Credit: 4 hours or 1 unit

Prerequisites: *ATMOS 301 or permission of instructor*

Course Content:

Clouds play a vital role in the Earth's climate by regulating the amount of incoming and outgoing energy, yet the role of clouds is one of the largest uncertainties in our understanding of climate and climate change. This course provides students with an understanding of our current understanding of the role of clouds in the climate system using readings from both textbooks and recent research papers. Topics to be covered include:

- 1) Microphysical and macrophysical properties of clouds
- 2) Aerosol-cloud interactions
- 3) Precipitation mechanisms
- 4) Radiative transfer in clouds
- 5) Remote sensing of cloud microphysics
- 6) Representations of aerosols, clouds, and radiative transfer in large-scale models
- 7) Special topics in current research

Text:

No required text. Chapters from the following books, in addition to current research papers, will be covered:

Liou, K.N., *Radiation and Cloud Processes in the Atmosphere*, Oxford University Press, 1992.

Hobbs, P.V., *Aerosol-Cloud-Climate Interactions*, Academic Press, 1993.

Rogers, R.R., and M.K. Yau, *A Short Course in Cloud Physics*, 3rd Edition, Butterworth-Heinemann, 1996.