

Department of Atmospheric Sciences

COURSE ANNOUNCEMENT – SEMESTER II – 2003–2004

ATMOS 497: Special Topics in Atmospheric Sciences

Section K: Clouds and Climate

Call number: 00801

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

E-mail: mcfarq@atmos.uiuc.edu

Room and Time: 109 Atmospheric Science Bldg., 3:00-4:15 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) Aerosols and aerosol-cloud interactions
- 2) Direct, indirect, and semi-direct effects of aerosols
- 3) In-situ measurements of clouds
- 4) Properties of liquid and ice clouds
- 5) Precipitation mechanisms and representation in models
- 6) Scattering by cloud particles and model representation
- 7) Remote sensing of cloud properties
- 8) Representation of clouds in climate models

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.

Lynch, D. K., *Cirrus*, Oxford University Press, 2002.