



# A CPT for Cloud Parameterization and Aerosol Indirect Effects

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# Cloud “macrophysics” and its application to aerosol indirect effects

- Goal: Improve (low) clouds in GCMs.
- Focus on the effects of aerosols on clouds
  - Can we activate aerosols correctly,
  - Covariability of microphysics and dynamics
- Test GCMs versus LES, aircraft observations, and satellite observations

# CAM Development Efforts

- Implement a new cloud macro-physical parameterization based on multivariate PDFs in CAM (and GFDL's AM) .
  - Cloud Layers Unified By Bi-normals (CLUBB: Larson & Golaz
  - Joint PDFs for vertical velocity, liquid potential temperature, and total water mixing ratio
- Generalize in CAM to work as a sub-column layer
  - Integrate with other CAM efforts: Sub-Columns, Statistical Cloud Schemes
  - SP-CAM
- Evaluate against Observations (e.g. VOCALS) & LES

# Team Members

- U. Wisc Milwaukee (Cloud parameterization): V. Larson
- GFDL (GCM simulations): L. Donner, J.-C. Golaz, Y. Ming
- NCAR (GCM simulations): A. Gettelman, H. Morrison
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- NOAA ESRL (LES modeling): G. Feingold