

# Physical Processes

## Goals:

- ❑ Better understand SGS processes (small clouds, turbulence, microphysics, radiation) in CRMs or MMF.
- ❑ Improve SGS physics in MMF.

Team Meeting, Fort Collins, July 2009

# Talks

1. Sonia Kreigenweis:  
“Prediction and impacts of global ice nuclei distributions”
2. Anning Cheng:  
“A Unified Mass Flux and Higher-order Turbulence Closure for Boundary-layer and Deep Convective Clouds”
3. Peter Bogenschutz:  
“PDF-based SGS parameterizations for MMF”
4. Chin-Hoh Moeng:  
“Giga-LES: Evaluation of SGS schemes in CRMs”
5. Eric Tromeur:  
“Cloud organization associated with frontal convection in midlatitude cyclones”
6. Tom Cram:  
“An evaluation of the radiation and turbulence parameterizations in the Vector Vorticity Model”
7. Wei-Kao Tao:  
“Three improvements of microphysics in GSFC-MMF”

# Short-term plans (next year or two)

- Diurnal cycle run of Giga-LES over land?
- Implementing a new ice nuclei scheme in SAM, then in MMF once aerosols are included (DeMott/Kreigenweis).
- Improving the PBL scheme in SAM (Moeng).
- Improving radiation/turbulence schemes in VVM (Cram).
- Testing IPHOC in MMF & coupling IPHOC with 2-moment microphysics (Cheng).
- Developing a PDF-based scheme for SAM (Bogenschutz).

# Long-term plans for renewal

- Develop a unified scheme of mass flux and IPHOC for clouds and test it in CRM and MMF (Cheng).
- Develop process coupled schemes, e.g.,  
PBL-low clouds,  
PBL-land surface,  
PBL-deep convection.