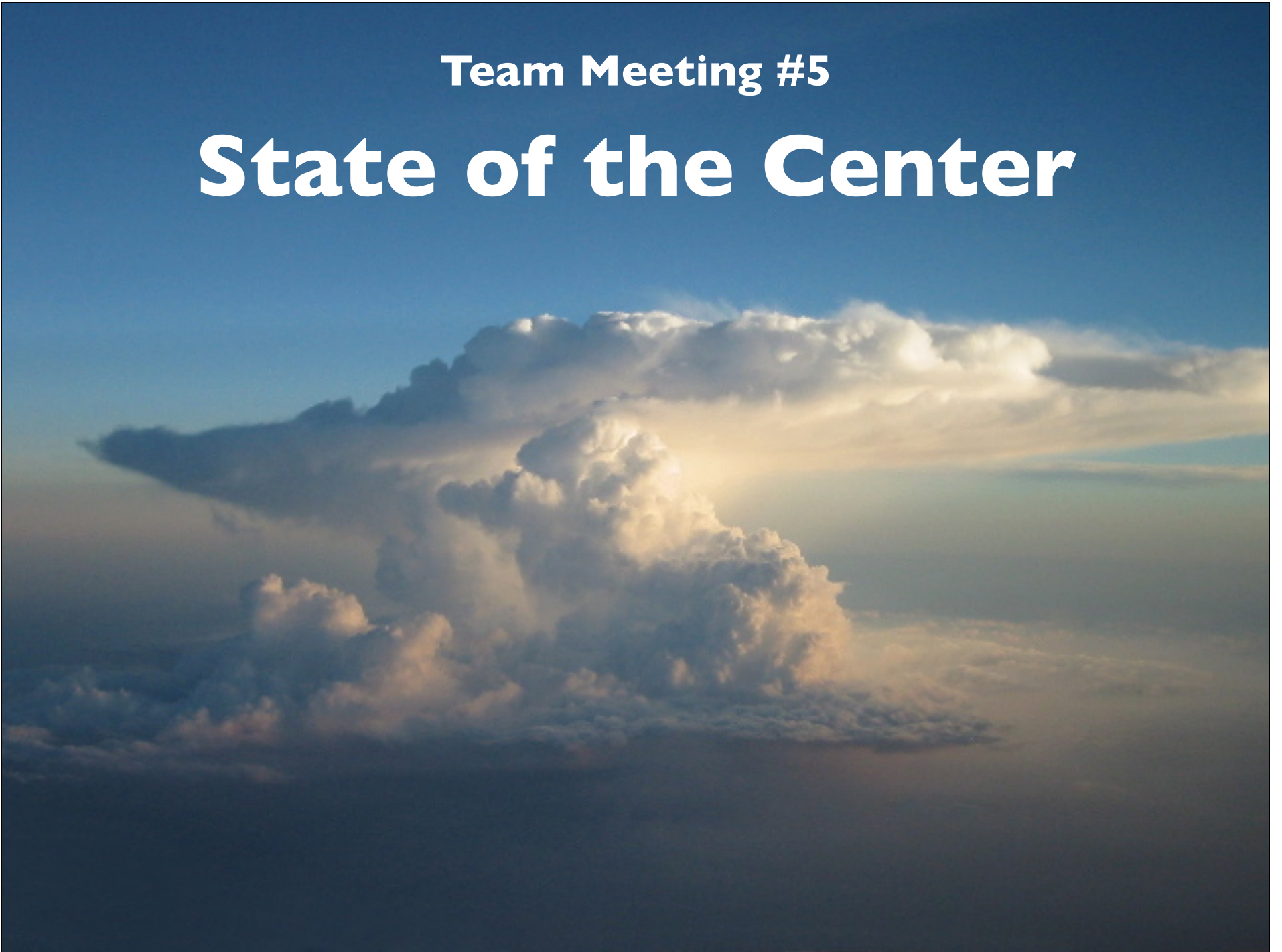


A high-angle view of Earth from space, showing the curvature of the planet, a bright sun on the horizon, and a lens flare in the upper right. The word "Welcome" is overlaid in white text.

**Welcome**

**Team Meeting #5**

# **State of the Center**



**CMMAP is two years old.**



**Have we changed the world yet?**

# Research Accomplishments

- ◆ **Q3D MMF is running in a test mode.**
- ◆ **GCRM is nearing completion.**
- ◆ **Prototype MMF is producing lots of results.**
  - ▲ **MJO**
  - ▲ **Low-cloud feedback**
- ◆ **New parameterizations are being tested in both SAM and the VVM.**
- ◆ **New work on conventional parameterizations**
  - ▲ **Statistical parameterizations**
  - ▲ **Turbulence parameterizations**

# K-12 Programs

- **Proposed:**

- **Locally-developed K-12 programs in weather and climate to be disseminated nationally**

- **Accomplished:**

- **Reached 50,000 K-12 students and hundreds of teachers through LSOP; millions via Windows to the Universe; presented at AGU, AMS, and APA**

# Teacher Training

- **Proposed:**

- **Survey of K-12 teacher to determine needs**
- **Classroom material to be developed and tested with LSOP, disseminated through UCAR**
- **One-week summer course for college credit in weather and climate for 40 K-12 science teachers**

- **Accomplished:**

- **As proposed, two years so far**

# Undergraduate

- **Proposed:**

- **Partnership with Colorado College:**

- **Summer Internships & Recruiting;**

- **Two courses: Air & Climate Change**

- **Accomplished:**

- **6 summer interns from CC, one admitted to CSU, one planning to apply**

- **Two undergrad courses as proposed**

- **ChangingClimates curriculum infusion initiative**

# Graduate Education

- **Proposed:**

- **Support climate science grad students**
- **Professional development in pedagogy and other aspects of research careers**
- **Partnership with SOARS**
  - **Mentor undergraduate proteges**
  - **CMMAP scientists give SOARS colloquia**
  - **Support SOARS graduate Fellows**

- **Accomplished:**

- **As proposed (22 students @ 5 institutions; summer grad institute; 5 SOARS Proteges, 2 Fellows)**



# Diversity

- **Proposed:**

- **Support graduate students from under-represented groups;**
- **Studies of (1) the science career pipeline; (2) media images of science; and (3) McNair Mentoring Program**

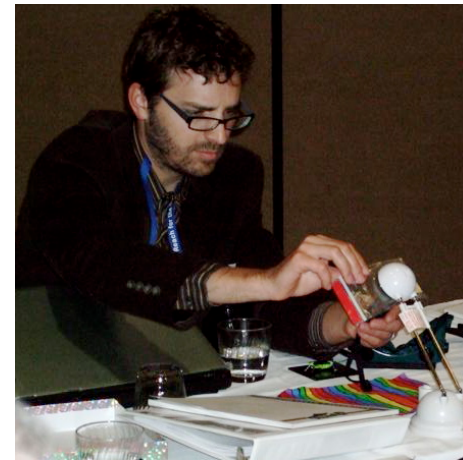
- **Accomplished:**

- **CMMAP grad students are 50% women; 10% African-American, 5% Latino; active recruiting**
- **Studies of career pipeline & media presented, to be published in year 3**

# **NSF site review was held in May.**



**Fred Semazzi Chaired.**



**Chris Weaver  
experienced Little Shop.**



**Lance Haworth, the  
new Director of  
OIA, attended**

# Issues raised by 2008 Site Visit Team

- ◆ **At present there seem to be too many research objectives (eight), and the relationships among these objectives have not been as clearly articulated as they need to be.**
- ◆ **Research is not sufficiently integrated into the diversity programs**
- ◆ **To effectively use “Giga-LES” model datasets to build improved parameterizations will require ... additional cases with different dynamical regimes.**

# Research Objectives from the Strategic Plan

Objective	Team Leader	Goal Supported	Research Theme Supported
1. Extensions, evaluations and applications of the prototype MMF	Khairoutdinov	A	MJO Low-cloud feedback
2. Development of a second-generation MMF	Randall /Arakawa	A	Future Tools
3. Develop and test improved microphysics parameterizations for MMFs and GCRMs	Krueger/Kreidenweis	A	Conv and Turb Future Tools
4. Develop improved parameterizations of boundary-layer clouds and turbulence for use in MMFs and GCRMs	Bretherton/Moeng	A	Conv and Turb Future Tools
5. Test sensitivity of CSRMs to more detailed radiation calculations	Barker	A	Future Tools
6. Innovative analysis, evaluation and interpretation of MMF results using emerging datasets	Rossow	B	MJO Conv and Turb
7. Accelerating improvement of conventional parameterizations	Stevens	A & C	MJO Low-cloud feedback Conv and Turb
8. Optimal use of computational and data storage resources	Helly	A	All

# Action items in response

- ◆ **Combine objectives 3-5**

  - ▲ **Turbulence, radiation, and microphysics now merged**

  - ▲ **Close correspondence with “Physical Processes” Theme**

- ◆ **Explicitly identify Objectives 2 & 7 as the primary research thrusts**


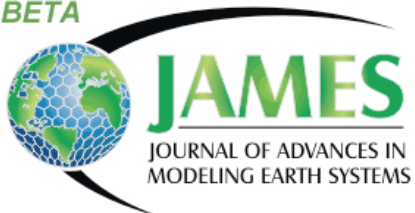


  - ▲ **2 is “Q3D MMF & GCRM”**

  - ▲ **7 is “Improved Conventional Parameterizations”**

- ◆ **Re-think Objective 6 (Obs)**

- ◆ **Create an organized planning activity for future Giga-LES runs**

# KT Accomplishments

<p><b>A contract has been signed.</b></p>	 The logo for Cambridge University Press, featuring a shield with four lions and the text "CAMBRIDGE UNIVERSITY PRESS" in white on a blue background.
<p><b>Submissions are being received.</b></p>	 The logo for BETA JAMES, featuring a globe with a blue and green grid, the word "BETA" in green, and "JAMES" in large green letters, with "JOURNAL OF ADVANCES IN MODELING EARTH SYSTEMS" below it.
<p><b>We are working with NCEP and ECMWF.</b></p>	 The logos for NCEP (National Centers for Environmental Prediction) and NOAA (National Oceanic and Atmospheric Administration). NCEP is a blue stylized 'C' with a white horizontal bar. NOAA is a circular logo with a white bird and the text "NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE".
<p><b>We are working with CCSM's Atmospheric Model Working Group.</b></p>	 The logo for NCAR (National Center for Atmospheric Research), featuring a blue stylized 'C' shape and the text "NCAR" below it.

# Building construction began in April.



**Year 3 funding arrived at CSU  
a few days ago.**







**Have we changed the world yet?**

# Research Objectives from the Strategic Plan

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# Research Goals

- 1. Create a radically new class of models that take advantage of petascale computers to produce dramatically improved simulations of the interactions of clouds with the global circulation of the atmosphere.**
- 2. Identify, analyze, and understand the strengths and weaknesses of the new models using a variety of state-of-the-art observational datasets, derived from in situ observing systems, as well as both ground-based and satellite-borne remote sensors.**
- 3. Apply the new models to develop an improved understanding of the role of clouds in the Earth system.**

# Research Vision

**To understand and predict the effects of clouds on a wide range of Earth-system processes.**

**We have accomplished a lot of our objectives already, but our goals and our vision will take a bit longer.**

# Fall AGU

**Multiple sessions of relevance to CMMAP, including one organized by Steve Krueger and Marat Khairoutdinov.**

# Introductions



**Glenn Shutts**



**Judith Berner**



**Bill Skamarock**



**Melissa Burt**

**Debbie Belvedere**



**Bill Skamarock**



**Bill Rossow**



# Jay Fein



**Fifth CMMAP Team Meeting, July 29 - 31, 2008**

<b>Tuesday, July 29, 2008</b>		
<b>8:30</b>	<b>David Randall, Jay Fein Cindy Carrick</b>	<b>Opening remarks/Agenda/Logistics</b>
<b>8:45</b>	<b>David Randall</b>	<b>Updates</b>
<b>9:15</b>	<b>Marat Khairoutdinov</b>	<b>Giga-LES</b>
<b>9:45</b>	<b>Raj Pandya</b>	<b>Diversity in the atmospheric sciences: Why is it so bad, and what can we do about it?</b>
<b>10:15</b>		<b>Break</b>
<b>10:30</b>	<b>Wayne Schubert</b>	<b>Introducing JAMES</b>
<b>11:00</b>	<b>Scott Denning et al.</b>	<b>Porting and packaging CMMAP Education &amp; Outreach</b>
<b>11:30</b>		<b>Lunch on your own</b>
<b>1:00</b>	<b>Glenn Shutts</b>	<b>Tropical waves, stochastic parameterization, and computer games</b>
<b>1:45</b>	<b>David Randall &amp; Scott Denning</b>	<b>Breakout Orientation</b>
<b>2:00</b>		<b>Breakout Session #1</b>
<b>3:00</b>		<b>Break</b>
<b>3:15</b>		<b>Breakout Session #1 Continues</b>
<b>4:15</b>	<b>David Randall</b>	<b>The CMMAP Modeling Landscape</b>
<b>4:45</b>	<b>Cindy Carrick</b>	<b>A year in the life of CMMAP</b>
<b>5:00</b>		<b>Adjourn for the day</b>
<b>6:30</b>		<b>Team Dinner at Wayne Schubert's house</b>

**Fifth CMMAP Team Meeting, July 29 - 31, 2008**

<b>Wednesday, July 30, 2008</b>		
<b>8:30</b>	<b>William Rossow</b>	<b>Testing the realism of the MMF (or any other GCM) Representation of the MJO</b>
<b>9:15</b>		<b>Breakout Session #2</b>
<b>10:15</b>		<b>Break</b>
<b>10:30</b>		<b>Breakout Session #2 continues</b>
<b>11:30</b>		<b>Lunch on your own</b>
<b>1:00</b>		<b>Breakout Session #3</b>
<b>3:00</b>		<b>Break</b>
<b>3:15</b>	<b>SueEllen Campbell &amp; John Calderazzo &amp; other CSU Faculty</b>	<b>Changing Climates and Focus the Nation</b>
<b>4:00</b>	<b>Mike Toy &amp; Kate Musgrave and others</b>	<b>What is an atmosphere model?</b>
<b>4:45</b>	<b>William Skamarock</b>	<b>Towards a Next Generation Weather and Climate Modeling System</b>
<b>5:15</b>		<b>Adjourn</b>
<b>5:30</b>		<b>Ask Dr. Science, Poster Session, JAMES booth, &amp; Reception</b>

**Fifth CMMAP Team Meeting, July 29 - 31, 2008**

<b>Thursday, July 31, 2008</b>		
<b>8:30</b>	<b>Connie Uliasz</b>	<b>Ethics Case Study and Discussion</b>
<b>9:30</b>		<b>Breakout Session #4</b>
<b>10:30</b>		<b>Break</b>
<b>10:45</b>		<b>Breakout Session #4 Continued</b>
<b>11:45</b>		<b>Lunch on your own</b>
<b>1:15</b>		<b>Reports from Breakout Sessions (10 mins each)</b>
<b>2:35</b>	<b>David Randall</b>	<b>Wrap-up</b>
<b>3:00</b>		<b>End of meeting</b>

Fifth CMMAP Team Meeting, July 29 - 31, 2008

## List of Breakout Sessions:

Where	Breakout Session #1 Tuesday PM	Breakout Session #2 Wednesday AM	Breakout Session #3 Wednesday PM	Breakout Session #4 Thursday AM
Main Meeting Room	<b>MJO</b> <i>Khairoutdinov and Moncrieff</i>	<b>Understanding Diversity in Climate Science Panel</b> <i>Pandya</i>	<b>Low-cloud feedbacks</b> <i>Stevens and Bretherton</i>	<b>E&amp;D Partnerships in CMMAP</b> <i>Foster</i>
Breakout room	<b>KT to NWP and Climate Centers</b> <i>Collins</i>	<b>Physical Processes</b> <i>Moeng and Krueger</i>	<b>Dynamical Framework</b> <i>Randall and Arakawa</i>	<b>CyberInfrastructure Working Group</b> <i>Helly</i>