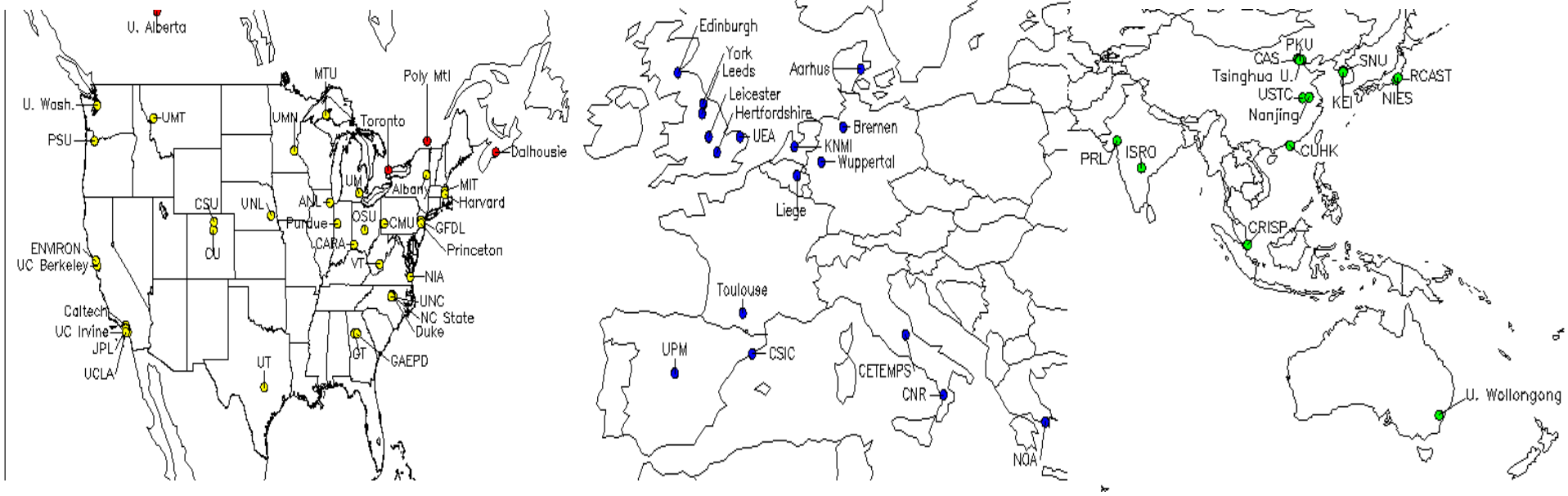
Welcome to the 5th International GEOS-Chem Meeting!

The GEOS-CHEM user community: 72 institutions, 18 countries



Thanks to the following organizations for their financial support of the meeting:

CSA ASC

NASA

National Centre for Atmospheric Science
NATURAL ENVIRONMENT RESEARCH COUNCIL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

NSF

Harvard University Center for the Environment

EPRI ELECTRIC POWER RESEARCH INSTITUTE

VE RI TAS

Thanks to Brenda Mathieu & Jacob group graduate students for logistics

Full Scientific Agenda: 90 Talks, 60 Posters

Day 1: Monday, May 2

- Model Overview
- Aerosol Sources and Chemistry
- Organic Aerosol

- Aerosol Processes and Radiative Forcing
- Tropospheric Ozone
- Photochemistry
- Regional Air Quality (posters and introductions)
- Poster Sessions (12:50 – 1:50, 6:00 onward)

Day 2: Tuesday, May 3

- Sources and Sinks
- Sources and Sinks: Nitrogen Gases

- Carbon Gases
- Climate-Chemistry Interactions
- Mercury and POPs
- Transport and Dynamics (posters and introductions)
- Poster Sessions (12:40 – 1:40, 6:00 onward)

Day 3: Wednesday, May 4

- Transport and Dynamics (oral)
- Regional Air Quality (oral)

Scientific Presentations

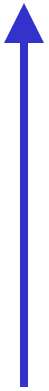
Live video cast organized by Lee Murray

… and GEOS-Chem Users Meeting

Day 3: Wednesday, May 4

Working Group Sessions (discussion, development needs)

- **Aerosol Processes**
- **Carbon Gases and Organics**
- **Sources and Sinks**
- **Oxidants and Chemistry**
- **Chemistry - Climate**
- **Model Adjoint**
- **Regional Modeling**
- **Hg and POPs**



Users Meeting (information sharing, community function, model development)

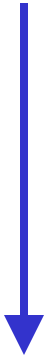
Day 4: Thursday, May 5

Working Group Reports ➔ Blueprint for model development

GEOS-Chem Business Meeting (decide priorities, elections)

Scientific Steering Committee Meeting (open to all)

Clinics for Model (led by Yantosca) and Adjoint (led by Henze)



Some Logistics

Uploading Talks (Thanks to Lee Murray)

http://www.fas.harvard.edu/~geos-chem

Username: GCMeeting

Password: GCUser

Directions on submission page

Presentations must be submitted before the break before your session

If you don't have web access, bring a thumb-drive to a member of the A/V team (Lee Murray, Patrick Kim, Helen Amos or Jenny Fisher) in the front of the room at the beginning of the break

Oral Presentations

Max 7 minutes

Remaining 3 minutes for Q&A + changeover

Posters

Oral introductions: max 1 minute

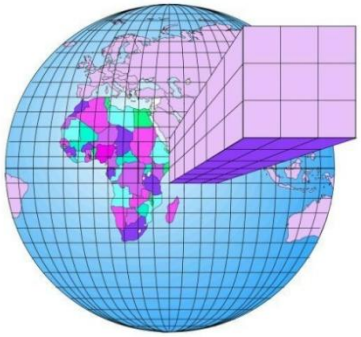
Monday's posters must be taken down before Tuesday morning

GEOS-Chem Chemical Transport Model (CTM)

Input data
- **NASA GEOS meteorological fields**
- **other**

Solve 3-D chemical continuity equations on global Eulerian grid

Modules
- **emissions**
- **transport**
- **chemistry**
- **aerosols**
- **deposition**
- **sub-surface**



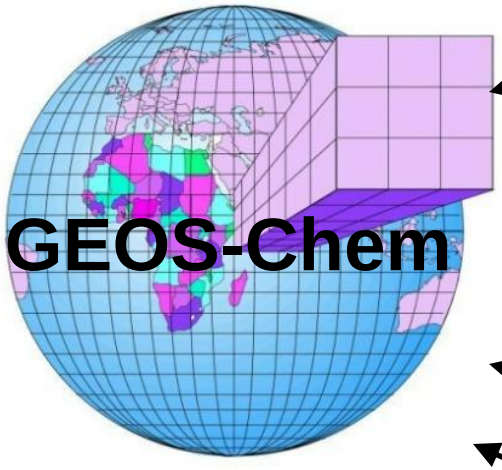
Model adjoint

Applications
- **chemical processes, transport, budgets**
- **inverse analyses**
- **radiative forcing**
- **air quality**
- **biogeochemistry**
- **…**

Capabilities of present standard model:

- **Aerosol chemistry and microphysics, tropospheric ozone-OH-NO_x chemistry, carbon gases, mercury, hydrogen, $^{222}Rn/^{210}Pb/^{7}Be$…**
- **1980-present GEOS meteorological data, future and paleoclimates (GISS GCM)**
- **Horizontal resolution:1/2ºx2/3º (native), 1ºx1º, 2ºx2.5º, 4ºx5º**
- **Adjoint model for inverse/sensitivity analyses**

GEOS-Chem contributes to broader Earth science activities



Aircraft and satellite missions
- forecasting and data analysis
- *a priori* infomation

Chemistry-climate interactions
- Two-way interface with GCMs

Earth system models
- Atmospheric chemistry module

Data assimilation systems
- Chemical data assimilation

Local air quality models
- outer nest

Collaboration with other CTMs
- module exchanges
- intercomparisons

Functioning of the GEOS-Chem community

- **GEOS-Chem is a grass-roots community model**
  - **Code is open-access, extensively documented and supported**
  - **All model development is initiated by users to serve their research needs**
  - **New developments are promptly implemented in the standard model**
  - **Young scientists have opportunity to get involved in model development**
- **Strong model management maintains model unity, traceability, state of science**
  - **GEOS-Chem Support Team (Harvard/Dalhousie) maintains standard model: new developments, benchmarking, version control, user support**
  - **Support Team is funded by NASA (1 FTE) and NSERC (0.5 FTE); strong leverage from community volunteerism is essential**
  - **GEOS-Chem Steering Committee monitors model development, promotes good practices and communication, leads Working Groups**
- **The model is owned by its users, and with ownership comes responsibilities:**
  - **Keep up with the model (newsletters, wiki, working groups, IGC meetings)**
  - **Contribute to the community: help with requests, report bugs…**
  - **Share mature developments for incorporation into standard model**
  - **Update regularly to latest standard version of model**
  - **Be generous in credit to developers**

The success of GEOS-Chem relies on the spirit of its user community!

The GEOS-Chem Steering Committee

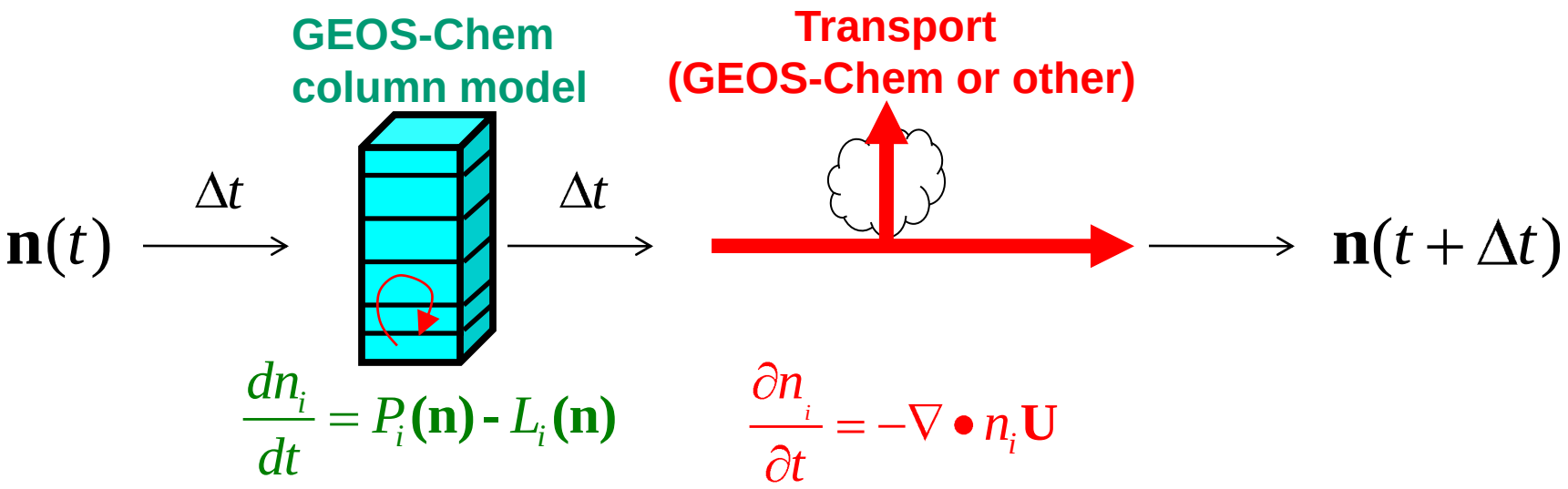
- **Model Scientist/Co-Scientist:** D.Jacob (Harvard), R. Martin (Dalhousie)
- **Adjoint Model Scientist:** D. Henze (U. Colorado)
- **Working Groups (Co-)Chairs**
  - *Aerosols:* C. Heald (Colorado State U.)
  - *Oxidants and Chemistry:* M. Evans (U. Leeds)
  - *Carbon Gases and Organics:* D. Jones (U. Toronto), D. Millet (U. Minnesota)
  - *Mercury and POPs:* L. Jaegle (U. Washington)
  - *Regional Air Quality:* R. Park (Seoul Nat'l U.), Y. Wang (Tsinghua U.)
  - *Adjoint Model and Data Assimilation:* K. Bowman (JPL)
  - *Sources and Sinks:* R. Martin (Dalhousie U.), P. Palmer (U. Edinburgh)
  - *Chemistry-Climate:* H. Liao (Chinese Acad. Sci.), L. Mickley (Harvard)
- **Ex Officio Members**
  - *GMAO liaisons:* P. Kasibhatla (Duke), S. Pawson (GMAO), M. Suarez (GMAO)
  - *Model engineer:* R. Yantosca (Harvard)

Steering Committee members are elected by the GEOS-Chem users to serve for four years with 50% turnover every two years; elections at business meeting onThursday

Major GEOS-Chem developments over the horizon

- **Increased GEOS-5 resolution to 1/4ºx5/8º**
  - **to be implemented in nested model for AQ applications (Y. Wang, Tsinghua)**

- **Column version of GEOS-Chem (Bob Yantosca, Harvard)**



  - **Makes model grid-independent**
  - **Allows flexible coupling to different dynamical cores for data assimilation, climate modeling**
  - **Facilitates massively parallel implementation through MPI**
  - **Will eventually replace the standard model**