GODDARD EARTH SCIENCES AND TECHNOLOGY CENTER

GEST DIGEST

VOLUME 4, ISSUE 4 APRIL/JUNE, 2002

Excellent Things Happening at GEST

Celebrating our 2nd Anniversary

GEST celebrated another year in operation on May 11, 2002. We are now *Two Years* Old. Since establishing GEST, more than 120 faculty and support staff members have been hired into the organization.

GEST is a consortium of scientists and engineers, led by the University of Maryland, Baltimore County (UMBC), to conduct scientific research in Earth and information sciences and related technologies in collaboration with the NASA Goddard Space Flight Center (GSFC).

GEST's central mission is the study of Earth's land surface, atmosphere, and oceans, emphasizing scientific excellence, as well as community outreach, education, and information technology. In addition to scientific and academic objectives, an important goal of this collaborative research is to connect Earth science to people's daily lives by studying phenomena that affect us all, such as coastline erosion, air pollution, the impact of development on the quality of water supply, and the depletion of the Earth's ozone layer.

Significant progress has been made in this second year in establishing GEST as a prominent center for research and international collaboration in the Earth and information sciences. The breadth of research interest has also grown, allowing the formation of five Research Group Leaders.

The Goddard Visiting Fellows Program in the Earth Sciences continued into its second year. This program provides the opportunity for selected Ph.D. scientists to pursue independent research in collaboration with scientists in the laboratories within the Earth Sciences Directorate either at the Goddard Space Flight Center or at the Goddard Institute for Space Studies.

During this second year, we added a permanent GEST researcher who is a faculty member at Hampton University, collaborating in oceanographic biology studies at the Wallops flight facility; a researcher on the faculty of Howard University joined GEST to collaborate in study of atmospheric aerosols. here are now several Caelum Research Scientists on the GEST scientific staff, and Caelum continues to provide the administrative support required by the Education and Visiting Scientists programs. Northrop Grumman has provided invaluable advice and support through representation on the GEST Executive Board, and plans to participate in this summer's new Coastal Research Fellowship program through mentoring and instrumentation support.

Robert J. Curran, Ph.D.
Director, GEST

GSSP Seminar Series

Visitors Center Auditorium, NASA Goddard Space Flight Center, Greenbelt, MD

In conjunction with the 2002 Graduate Student Summer Program in Earth System Science, the Goddard Earth Sciences and Technology Center (GEST) and the Earth Sciences Directorate of the Goddard Space Flight Center (GSFC) organized a lecture series held **June 11-14, 2002**.

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THE GEST UMBC OFFICE WILL BE CLOSED ON JULY 4TH AND 5TH

GSSP SEMINAR SERIES—JUNE 10– 14, 2002

GSSP Seminar Series

Climate Change and the Global Water Cycle

Visitors Center Auditorium, NASA Goddard Space Flight Center, Greenbelt, MD

In conjunction with the 2002 Graduate Student Summer Program in Earth System Science, the Goddard Earth Sciences and Technology Center (GEST) and the Earth Sciences Directorate of the Goddard Space Flight Center (GSFC) have organized a lecture series to be held **June 11-14, 2002**. This series intends to promote the understanding of current scientific knowledge about the challenges of global change, and how NASA supports the research underpinning this knowledge.

Tuesday June 11
Global Climate- Change, Past and Future

9:00 am **Welcome Mark Schoeberl, GSFC**

9:10 am Global water and energy cycle: NASA plans to address key uncertainties. **Robert Schiffer, GEST**

10:30 am Water vapor, clouds, and the Earth radiant energy balance. **William Collins, NCAR**

1:30 pm Climate change and expected impacts on the global water cycle. **David Rind, GISS**

2:50 pm Global precipitation: observations, historical records, and trends. **Bob Adler, GSFC**

Wednesday June 12

Water Cycle Predictability and Prediction

9:00 am Welcome **Robert Curran, GEST**

9:10 am Relationships between weather extremes, climate variability and long-term trends. **Wayne Higgins, NOAA**

10:30 am Predictability of seasonal weather and precipitation patterns. **Randy Koster, GSFC**

1:30 pm Severe hydrologic events: predictability and trends projection. **Harry Lins, USGS**

2:50 pm Quantitative precipitation forecasts: prospects and outstanding science challenges. **Chris Kummerow, Colorado State University**

Thursday June 13

Water Cycle Processes and Observations

9:00 am Welcome **Tom Low, GEST**

9:10 am Multi-scale cloud system simulation, dynamics and transport. **Mitchell Moncrieff, NCAR**

10:30 am Ocean-atmosphere fluxes: surface interaction, PBL transport, and the role of moist convection. **Mark Helfand, GSFC**

1:30 pm Land-atmosphere fluxes: evaporation, soil moisture, and run-off: observation and modeling. **Matt Rodell, GSFC**

2:50 pm Land surface and hydrologic observations. **Christa Peters-Lidard, GSFC**

Friday June 14

Water Resources and Hydrologic Applications

9:00 am Welcome **Robert Schiffer, GEST**

9:10 am Hydrologic modeling and prediction systems. **Guido Salvucci, Boston University**

10:30 am Dealing with spatial variability in landscape, soil, and hydrologic variables. **Dennis Lettenmaier, University of Washington**

1:30 pm Evapotranspiration and its estimation with satellite data. **Thomas Schmugge, USDA**

2:50 pm Impacts of water system management and human demand on water resources. **Soroosh Sorooshian, University of Arizona**

SPARC DA Workshop held at UMBC, June 10-12, 2002

GEST hosted this year's SPARC DA Workshop at UMBC Campus from Monday - Wednesday, June 10-12, 2002.

The workshop began with welcoming remarks from Tom Low, GEST Associate Director followed by remarks from Professor Alan O'Neill from the Department of Meteorology, Reading University on the SPARC Data Assimilation Project: rationale and priorities.

Monday's topics included:

Exploitation of ESA Atmospheric EO Measurements through Assimilation Techniques - **Claus Zehner**

Intercomparison of DATA Assimilation Products in the Polar Winter Stratopshere - **Gloria Manney**

Stratospheric Data Assimilation at the Met Office—**Richard Swinbank**

Meteorological analyses in the DAO: operational and reanalysis products

Sensitivity of middle atmospheric analyses to the representation of gravity-wave drag in the DAO's data assimilation system - **Shuhua Li**

On the extended stratospheric version of the 3D-Var/GEM model of the CMC/MRB using a new hybrid vertical coordinate - **Sandrine Edouard**

Recent developments in data assimilation system for the Canadian Middle Atmosphere Model (CMAM) - **Saroja Polavarapu**

On Monday evening a reception was held at The Commons Skylight Room to formerly welcome the participants to UMBC.

Tuesday—June 11th—Topics

Reconstruction of Stratospheric Ozone Fields using Equivalent Latitude Mapping - **Cora Randall**

Global 3-D Ozone Estimation Using TOMS Column Ozone and Equivalent Latitude - **Douglas Allen**

An Overview of the SBUV/2 Operational and Reprocessed Ozone Data - **Shobha Kondragunta**

Use of 3D Global Ozone Fields to Simulate Satellite Data for Testing Data Assimilation and Inversion Algorithms - **John Hornstein**

Assimilation of ozone data in the ECMWF assimilation system - **Antje Dethof**

Ozone Assimilation at the Data Assimilation Office - **Ivanka Stajner**

Ozone assimilation at the Met Office - David Jackson

GOME ozone data assimilation and ozone forecasting at the KNMI - **Henk Eskes**

Ozone assimilation system with coupled GCM and CTM developed at MRI/JMA - **Toru Sasaki**

An ozone assimilation strategy using SBUV radiances - Pawan K. Bhartia

Wednesday—June 12th—Topics

Assimilaiton of /Envisat data at DARC - William Lahoz

4D-var assimilation of satellite data: uniqueness tests and CRISTA data assimilation - **Hendrik Elbern**

Towards operational chemical data assimilation at BIRA-IASB: BASCO - **Dominique Fonteyn**

An Overview of constituent assimilation efforts at NCAR, ACD - **Jean-Francois Lamarque**

Using Data Assimilation for Scientific Assessment of Atmospheric Chemistry - **David Lary**

SOMETHING TO CHEER ABOUT

CONGRATULATIONS

MICHELE MCCOURT

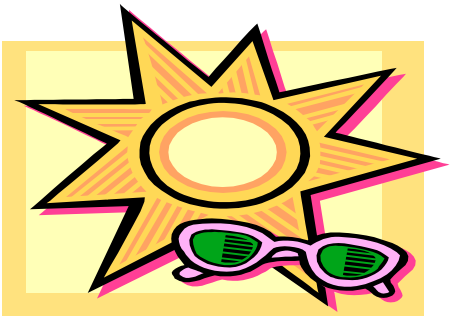
GEST FELLOW
(2001-2002)

Congratulations to Michele McCourt, our first GEST Graduate Fellow in Atmospheric Physics on receiving her Master of Science Degree in May, 2002. She is also the first student granted a degree through UMBC's new Atmospheric Physics Program.

Michele was chosen as UMBC's nominee for the AAPT outstanding teaching assistant for 2000. She had the unique opportunity to be a field technician at Andros Island, Bahamas during CAMEX-4, September 2001 and is planning on being on site at Chesapeake Light as part of BAOVE in the Summer of 2002.

SUMMER SAFETY TIPS

NOW THAT WE ARE INTO THE SUMMER SEASON - REMEMBER TO PRACTICE SAFETY - ALWAYS WEAR SUNSCREEN, DRINK PLENTY OF FLUIDS TO PREVENT OVERHEATING. IT SEEMS THAT THIS SEASON PASSES IN THE BLINK OF AN EYE. IN BETWEEN ALL YOUR ROAD TRIPS AND ROLLER COASTER RIDES, DON'T FORGET TO TAKE TIME TO RELAX AND ENJOY THE SEASON.



GEST FACULTY GUIDEBOOK & ANNUAL REPORTS

Don't forget to pickup your copy of the GEST Faculty Guidebook. Answers to some of your most frequently asked questions are included.

How do I hire personnel?

What is the Request for Travel Form?

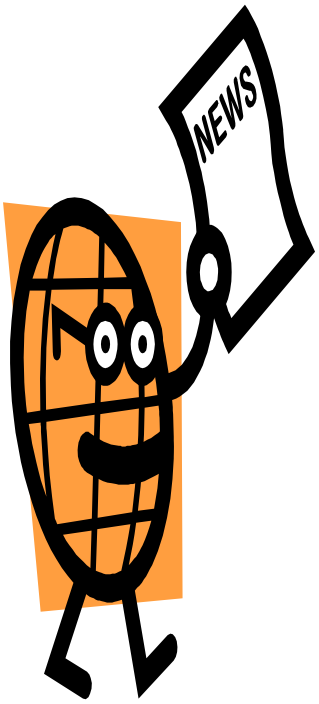
Who's the contact person for my particular question?

What's my annual leave balance?

Pick up your Guidebook at the GEST Office in Building 28.

Those of you who are sponsors can also pick up a copy of the new GEST Sponsors Handbook.

GEST's 2001-2002 Annual Reports are ready for distribution. Look for them in the mail within the next few weeks.



Welcome

to all our new GEST faculty and staff

New Faculty Members

GEST would like to welcome the following new faculty Members.

Dr. Mircea Grecu	Code 912
Dr. Daniel Jacobs	Code 971
Dr. Tom Low	Code 900
Dr. Alexei Lyapustin	Code 920
Dr. Robert Schiffer	Code 900
Dr. Xiping Zeng	Code 912

Administrative Changes (New Staff)

Dr. Tom Low, has been hired as the Associate Director of GEST. Tom comes to us from Caelum Research Corporation where he served as Manager, Applied Sciences. Tom is located at our UMBC South Campus office Room, 3.002, phone, 410-455-8814.

Dr. Robert Schiffer has joined GEST as a Chief Scientist. His background is in Atmospheric Sciences and Climate Research. Dr. Schiffer is located at our UMBE South Campus office Room, 2.048 - phone, 410-455-8810.

Dr. Henry Plotkin is leaving GEST but will not be disconnected from GEST. He's joining our sister company JCET as Chief Scientist.

We will certainly miss Dr. Plotkin but at the same time we extend our gratitude for his expertise while working at GEST.

REMINDERS

GEST INFORMAL FACULTY MEETING

Our next Informal Faculty Meeting is scheduled for July 19th at 10:30 a.m., Bldg. 28 Atrium.

Travel

Please don't forget to complete a Request for Travel form each time you travel. This includes trips that are being funded by outside sources. This is to ensure that as a UMBC employee you are covered for liability insurance should you have an accident on the trip. Having prior travel approval also ensures smoother processing should the need arise to claim Workman's Compensation (another area of protection for you should an accident occur while you're traveling).

Time Sheets

These forms are available electronically by contacting Nancy Flowers at flowers@umbc.edu. At the end of each calendar month you should print out the completed form, sign it, and bring the form to the GEST Office in Building 28, Room W223, or PROMPT MAIL it to the same address, Code 900.1. These forms will be used to track your leave, and ensure that your pay is correct. It is therefore, essential that these be turned in by the fifth working day of the subsequent month.

Expense Reimbursements

The traveler may copy an expense statement to claim reimbursement and forward the completed copy, along with a **blank signed** expense statement to the UMBC GEST office. Contact Nancy Flowers at the UMBC GEST office (410 455-8899) to verify if signed forms are on hand. If travel was for an extended period, i.e., more than 7 days, more than one blank, signed expense statement should be submitted with the original receipts. Blank expense statements may be acquired from the GEST office at Goddard or the UMBC GEST office.

All Travel Requests, Time Sheets and Expense Reimbursements are to be submitted to Nancy Flowers at: flowers@umbc.edu.

OTHER IMPORTANT DATES

5TH of each month

Monthly time sheets due into GEST Office

Jan. W2 received at home by Jan 31

Feb. GEST Annual Report input due to Faculty Group Spokesperson

Mar. UMBC Faculty Annual Report (FAR) due

Apr. Deadline for filing Federal and State tax returns April 15th.

May Faculty Meeting

June UMBC Fiscal year closes June 30th. All expense forms due in by early June

July GEST Annual Research Program Plan distributed (ARPP)

Aug.

Sept. Consulting Report
GEST Faculty Quarterly Meeting Schedule - Sept. 18, 2002 - GSFC

Oct. Faculty Meeting Open enrollment for Health Plans

Nov. Thanksgiving

Dec. All non-US citizens must file new Citizenship Status Form and W4 - **Christmas**
GEST Faculty Quarterly Meeting Schedule Dec. 18, 2002 UMBC

REMINDERS - Policy for Research Proposal Submissions

Research proposal submissions require coordination between GSFC and the Centers on several levels. For scientific content, the proposals should further the goals of the Center and GSFC Earth Sciences Directorate and not range into obscure research areas. The proposals must be coordinated with other submissions from GSFC and, therefore, Sponsor, Branch Head and Laboratory Chief approval are required.

Research budgets need to be evaluated to determine that correct overhead rates are applied within the University, that applicable laboratory and branch taxes are included, and that manpower costs are included where appropriate. For GEST Faculty, this will include appropriate "Offsite Facility Charges." For this reason, all research proposals must be evaluated by the appropriate GSFC Branch business office as well as the Center Business Manager. All research proposals require the approval of the Office of Sponsored Programs at the University.

Multi-university proposals can be complicated by pass-through requirements for funding. All such monetary transfers must be clearly stated in the research proposal. Sign-offs for each university are required from the appropriate university officer.

For research proposals where Center Faculty are Principal Investigators, coordination of the approvals for the research proposal will be ensured by the Center Director and by the Director of Contracts, in the Office of Sponsored Programs. All research proposals will be submitted with the University Routing Form as cover sheet. Please refer to UMBC's website for the Routing Form. For research proposals where Center Faculty are Co-Investigators, budgets need to be examined by the local business office and by Sponsored Programs.

Required signatures are:

Principal Investigator

Center Director

Director, Contracts, Sponsored Programs

Proposal Cover Sheet:

Principal Investigator

Director, Contracts,

Sponsored Programs

Proposal Signatory Page:

Principal Investigator

Co-Investigators (and officials of their agencies)

Center Director

Branch Head (if any civil service personnel are committed to the proposal)

Laboratory Chief (if any civil service personnel are committed to the proposal)

Unfortunately, research proposal writers usually work right up to the submission deadline and it is often not realistic to assume that the final proposal is prepared far enough in advance to get a full review of the finalized proposal by the signatories. ***In principle, proposals should be prepared in sufficient detail including a finalized budget two weeks prior to submission.*** In lieu of a finalized proposal, a draft proposal should be included with the signatory pages above. Final copies of the proposal as submitted to the funding agencies must be submitted to the Center Office as well as to the Branch Head.

Upon review and funding notification from the sponsoring agency, research proposals are often modified from their submitted form. When a proposal has a modification, it must be resubmitted to the signatories above with a letter stating the scientific changes and budget.

PUBLICATIONS & SEMINARS

Publications

Paul Ginoux

Balkanski, Y., M. Schulz, T. Claquin, C. Moulin, and **P. Ginoux**, "Global emissions of mineral aerosol: formulation and validation using satellite imagery", Proceedings of Emissions of Chemical Species and Aerosol into the Atmosphere Workshop, Paris, France, June 19-22 2001, submitted April 2002.

Gregg, W., **P. Ginoux**, P. S. Schopf, and N. W. Casey, Phytoplankton and Iron: Validation of a global three-dimensional ocean biogeochemical model, Deep Sea Res., submitted April 2002.

Ginoux P., Effects of non-sphericity on mineral dust modeling, J. Geophys. Res., submitted May 2002.

Weaver, C., J. Joiner, and **P. Ginoux,** Mineral aerosol contamination of TOVS temperature and moisture retrievals, submitted to J. of Climate, May 2002.

Randall V. Martin 1 , Daniel J. Jacob 1 , Robert M. Yantosca 1 , Mian Chin 2,3 , **Paul Ginoux,** Global and regional decreases in Tropospheric oxidants from photochemical effects of aerosols, submitted to JGR, June 2002.

Gregg, W., M. E. Conkright, M. J. Behrenfeld, **P. Ginoux,** and N. W. Casey, Decadal changes in global ocean annual primary production, submitted to Science, June 2002.

Shuhua Li

Li, S., E. C. Cordero, D. J. Karoly, Transport out of the Antarctic polar vortex from a three-dimensional transport model, J. Geophys. Res., 107(D11), 1029/2001JD000508, 2002.

Judit Pap

SOLAR IRRADIANCE VARIATIONS OVER SOLAR CYCLES 21 TO 23, **J. M. Pap** (Goddard Earth Sciences and Technology Center, UMBC), J. Kuhn (Institute of Astronomy, University of Hawaii), H. Jones (NASA Goddard Space Flight Center, Southwestern Station/NSO), M. Turmon (Jet Propulsion Laboratory), N. Arge (NOAA Space Environment Center), W. Schmutz (World Radiation Center, PMOD), L. Floyd Interferometrics Inc., NRL)

Oreste Reale

Reale, O., and P. Dirmeyer, 2002: Modeling the effect of land-surface variability on precipitation variability. Part I: General response. In press on Journal of Hydrometeorology.

Reale, O., P. Dirmeyer, and A. Schlosser, 2002: Modeling the effect of land-surface variability on precipitation variability. Part II: Time- and space-scale structure. In press on Journal of Hydrometeorology.

Joan Rosenfield

"The impact of increasing carbon dioxide on ozone recovery" by **J. E. Rosenfield**, A. R. Douglass, and D. B. Considine, J. Geophys. Res., Vol. 107 (D6), 10.1029/2001JD000824, 2002.

Chung-Lin Shie

Convective Systems over the South China Sea: Cloud-Resolving Model Simulations W.-K. Tao, **C.-L. Shie,** D. Johnson, J. Simpson, S. Braun, R. H. Johnson and P. E. Ciesielski, (Submitted to *J. Atmos. Sci.)*

(Mesoscale Convective Systems during SCSMEX: Simulations with a Regional Climate Model and a Cloud-Resolving Model W.-K. Tao, Y. Wang, J.-H. Qian, **C.-L. Shie**, W. K.-M. Lau and R. Kakar (Submitted to a *Book published by the INDO-US Climate Research Program)*

Chaojiao Sun

Sun, C., Z. Hao, M. Ghil and J. D. Neelin, 2002: Data Assimilation for a Coupled Ocean-Atmosphere Model. Part I: Sequential State Estimation. *Mon. Wea. Rev.,* **130**,1,073-1,099.

Xiwu Zhan

X Zhan, J Entin, P R Houser, R H Reichle, J P Walker: "Application of Kalman Filtering for Soil Moisture Data Validation in NASA's Land Data Assimilation System", EOS, Trans. AGU, 83(19), Spring Meeting Suppl., Abstract H51D-09, 2002 (page S194).

Seminars

Alexander M. Chekalyuk

A.M. Chekalyuk, F.E. Hoge, R.N. Swift, and J.K. Yungel, Superactive pump-and probe LIDAR technology: Biophysical insight into aquatic remote sensing, OSA International

Tom Eck

Eck, T F., B. N. Holben, M. M. Mukelabai, O. Dubovik, A. Smirnov, J. S. Schafer, and I. Slutsker Seasonal Variability of Aerosol Single Scattering Albedo at Biomass Burning Sites in Southern Africa and Amazonia, AGU Spring Meeting, Washington DC, May 28-31, 2002.

Holben, B. N. , **T. F. Eck**, O. Dubovik, A. Smirnov, I. Slutsker, P. Artaxo, A. Leyva, D. Lu, I. Sano, R. P. Singh, E. Quel, D. Tanre, and G. Zibordi, AERONET - Aerosol Climatology From Megalopolis Aerosol Source Regions, AGU Spring Meeting, Washington DC, May 28-31, 2002.

Charles Gatebe

Gatebe C .K., M. D. King, and G. T. Arnold, Airborne Spectral Measurements of Ocean Anisotropy during CLAMS, Eos. Trans. AGU, 83(19), Spring Meet. Suppl., Abstract A21D-07, 2002.

Gatebe C .K., M. D. King, and G. T. Arnold, Airborne Multispectral Measurements of Bidirectional Reflectance-Distribution Using Cloud Absorption Radiometer, Third International Workshop on Multiangular Measurements and Models, Abstract 15, 2002.

Wenying, S., T. P. Charlock, C. K. Rutledge, and **C. K. Gatebe**, Ocean Reflectance Observed during CLAMS, Eos. Trans. AGU, 83(19), Spring Meet. Suppl., Abstract A21D-08, 2002.

Smith, W. L., T. P. Charlock, T. Zhang, P. V. Hobbs, **C. K. Gatebe**, R. A. Rivers, and V. E. Roback, An overview of the Chesapeake Lighthouse and Aircraft Measurements for Satellites (CLAMS) Experiment, Eos. Trans. AGU, 83(19), Spring Meet. Suppl., Abstract A21D-02, 2002.

Gail Skofronick-Jackson

"Observations of Snowfall over Land by Microwave Radiometry from Space," by G.M. Skofronick-Jackson, J.A. Weinman, and D.-E. Chang.

Judit Pap

200th Assembly of the American Astronomical Society (AAS/SPD) Meeting, Albuquerque, NM, June 2-7, 2002.

Zhaoxia Pu

Pu, Zhaoxia, W.-K. Tao, and W. Olson, 2002: Mesoscale Assimilation of TRMM Data with 4DVAR. 5th Workshop on Application of Adjoint in Meteorology, April 21-26, 2002, Mount Bethel, PA.

Pu, Zhaoxia, Applications of Data Assimilation in Improving Atmospheric Modeling. Rutgers University, April 16, 2002.

Rolf Reichle

Reichle, R.H., R.D. Koster, Land data assimilation with the Ensemble Kalman Filter: Assessing model error parameters using innovations, Invited Presentation at the XIV International Conference on Computational Methods in Water Resources, Delft, Netherlands, June 2002

X Zhan, J Entin, P R Houser, **R H Reichle,** J P Walker: "Application of Kalman Filtering for Soil Moisture Data Assimilation in GSFC's Land Data Assimilation System", Presented at AGU Spring Meeting 2002, Washington, DC.

R H Reichle: "Lessons learned from data assimilation into uncoupled land models", Invited Presentation at the Workshop on Land-atmosphere Coupling Aspects in Land Data Assimilation and SVAT Parameter Estimation, Global Land Atmosphere System Study (GLASS), Apr 2002, DeBilt, Netherlands.

Susan Strahan

American Geophysical Union in Washington

DC, S.E. Strahan, "Influence of Planetary Wave Transport on Arctic Ozone as Observed by POAM III" - May 28, 2002.

NASA/GSFC web site 5/28/02 - "A warm polar winter was easier on Arctic ozone.".

Song Yang

Latent Heating Structure of Hurricanes from TRMM measurements" at the 25th Conference on Hurricane and Tropical Meteorology at San Diego Apr 29-May 3.

2nd International Planning Workshop on Global Precipitation Measurement (GPM) Tokyo during May 20-22 in Tokyo.

GODDARD EARTH SCIENCES AND TECHNOLOGY CENTER

GEST

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HTTP://WWW.UMBC.EDU/GEST/

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