



The CEDAR Post

Coupling, Energetics and Dynamics of Atmospheric Regions

Spring 2003

<http://cedarweb.hao.ucar.edu/commun/cedarcom.html>

Volume 47

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From the Editor

When you receive this edition of the CEDAR Post, Dr. Sunanda Basu will have left her administrative position at National Science Foundation to rejoin us as a full-time scientist. A section of this edition has been devoted to expressing thanks for her service to CEDAR and the Aeronomy Program. People with a breadth of talent such as Sunanda are rare. Even though she is changing emphasis, we will continue to enjoy working with her and having her in our midst.

In an attempt to gather together a concise and accurate description of the work done in the third phase of CEDAR, the CEDAR Science Steering Committee has considered several options, but has decided to move forward with a report on the highlights of the program since the 1997 inception of phase 3. This report is now in preparation and headings from it are listed in the abbreviated minutes of the steering committee meeting held last November. I am hoping that a preprint of the full highlights report will be available just before the CEDAR workshop this coming June. It will be prepared in the form of a CEDAR Post edition and will be on the CEDAR website in the form of a pdf file. The contributors to this report were assigned from the membership of the CSSC. I think many of you will have been consulted on the preparation of the brief sketches of individual highlight achievements and hence may have seen parts of the report during its drafting. There will be an opportunity to gather comments and suggestions for the final publication at the CEDAR Workshop.

Much discussion has occurred concerning the location of the CEDAR workshop. After more than ten years of going to Boulder and holding the workshop at NCAR, NIST, NOAA and at CU, we have had two meetings at Longmont. Acceptance of the new Longmont location has not been 100 percent, but the location was appreciated by the majority. Now we are going to move again to hold our meeting in Santa Fe, New Mexico. This is not so much a move away from Longmont as a desire for a completely new locale. Many of you have been to meetings in Santa Fe, for example, the Ionospheric Modification workshops. Barbara Emery and Louise Bierle have thoroughly researched the facilities in Santa Fe and organizational modifications required and have reported very favorably. I believe that Santa Fe can provide very pleasant surroundings with adjacent housing and conference facilities in a historic town with many attractions for us. In addition, it does offer the possibility that we will be able to benefit from the collocation of the GEM meeting in 2005 with opportunities for some sessions, such as ionosphere-magnetosphere coupling, to be attended by both communities.

Roger Smith, CSSC Chair

Ten Years of Excellence: Sunanda Basu Departs NSF Post



After ten years of service as the National Science Foundation's aeronomy program manager, Dr. Sunanda Basu is stepping down.

Dr. Basu joined the NSF Upper Atmosphere team in 1992 and went on to become the organization's longest-serving aeronomy program manager. During this time, Dr. Basu has served the aeronomy community with distinction. Her management style has the hallmarks of always being well prepared, always presenting clear and complete information, and concern for the sensitivities of indi-

viduals. Her consistent positive and supportive approach to CEDAR has nurtured the program through more than half of its life.

Since Dr. Basu is an active scientist who wishes to return to a life with more time devoted to her personal science goals, we are glad to wish her well as she relinquishes the daily tasks of administration on our behalf. Along with those good wishes, we are united in thanking her fully and enthusiastically for the devoted service that she has contributed to CEDAR.

Roger Smith, CSSC Chair

Summary of Minutes of the November 2002 CSSC Meeting

The following is a brief summary of the November 2002 CSSC meeting. During the meeting, we heard from National Science Foundation managers that:

- The National Research Board is considering the idea that NSF should have major research equipment opportunities at the level of mid-size facilities for cases which fall between large facilities and grant lines. This will provide an opportunity for AMISR to be funded with resources available within the GEO Directorate this year. The next National Research Board meeting should resolve this.

- Educational resource creation and the access of society and communities to our research is the foremost change in the culture of doing science in our lifetime.

- NSF is expecting a 10-15 percent increase in its budget this next financial year and CEDAR, CISM and the ionospheric part of NCAR are expected to benefit.

Continued



Serious discussion continues through the break at the November 2002 CEDAR Science Steering Committee meeting, held at the National Corporation for Atmospheric Research (NCAR) facility in Boulder, Colorado. From left are Art Richmond (NCAR), Kile Baker (National Science Foundation), and Sunanda Basu (National Science Foundation).

Summary of CSSC Meeting Minutes *continued*

- On the retirement of Sunanda from NSF, there is an urgent need for a new aeronomy program director. Expect a rotator position.

- The ionospheric part of the CISM is at NCAR, administered from Upper Atmosphere Facilities.

- It appears that the Upper Atmosphere Section did fine with the recent internal review. We had good support from science highlights thanks to the submissions of our scientists. Keep it coming.

- There is a new faculty program under consideration at NSF. The goal is to increase number of faculty positions in the community. For aeronomy the aim is get two new tenured positions established through a joint commitment by NSF and the participating university.

- We were reminded that it is important to get proposal reviews in a timely way. Also, we heard that awards may be longer and for larger sums, although unfortunately there will also be fewer in number.

- Several upgrades have been done for CEDAR facilities. Working klystrons were rescued during the dismantling of the older radar at Clear, Alaska. Sondrestrom Radar upgrades have enabled klystron replacement at reasonable cost. A Sousy radar is now at Jicamarca. Millstone was key to midlatitude storm effects definition with LWS.

- The Madrigal system now has Kharkov and Irkutsk data which is

useful for those working on TIMED investigations.

- NSF will move to convene a community planning group for LIDAR.

- Discussion on Living with a Star: The committee considered the possibility that CEDAR should act collectively in a role for the International Living with a Star ground-based component. It was agreed that CSSC should be represented at LWS meetings and form an opinion on this for a later meeting. It is expected that any participation would be funded through NSF.

- For LWS, NASA will not be as generous compared to ISTP. Only place for ground-based is in the targeted research and technology (TR&T) \$18M/annum total.

- Data analysis with ground-based support is OK but not to support radars to take data. In ISTP all data was collected centrally. NASA is considering distributed archive virtual observatory approach. Data formats are a problem with ground-based. Perhaps a centralized NASA ground-based facility would work. Software and technology for a virtual observatory are not trivial concerns.

- Discussion on the CCMC/ Database: Barbara Emery presented a CEDAR database report indicating increasing use in most categories. Hemispheric power and equatorward auroral boundary data holdings are now being updated.

- Update on the CCMC: The multi-agency Community Coordinated Modeling Center (CCMC) at GSFC takes models from the community and transitions them to operational status. Models are run and tested and compared with metrics. Objective seamless end-to-end operations are provided. Runs are made on request. Documents are available at the website on concepts of operations. Data provision would benefit from a virtual observatory. <http://ccmc.gsfc.nasa.gov>

- Update on CISM: CISM is a Science and Technology Center of excellence based at Boston University, headed by Jeff Hughes. CISM will develop a seamless global geospace circulation model and associated educational and public outreach activities. It was selected in 2002 and receives NSF funding of \$4M/yr. The strategic plan is in development now.

- Update on CEDAR Postdoc: Last year there were four applicants, two or which were funded at 80k per proposal.

The CEDAR Science Steering Committee recommends continuation of the program as a means of providing career-building opportunities to selected young CEDAR scientists. Small changes were recommended in procedures so that the announcement is made in mid-January, mail-in reviews be preferred over panel review and the result be available for appointments in the fall semester.

2002 Workshop Report: Daytime/Twilighttime Optical Aeronomy From Ground and Space

Conveners: D. Pallamraju and M. Conde

Ground-based investigation of atmospheric phenomena during the day is the least explored area of research in space physics. In recent times new techniques have been developed and new ideas have emerged for making daytime optical measurements from both ground and space. Considering the great potential in this frontier area of research and to provide a platform to discuss the successes, difficulties of various research efforts, this workshop was proposed. The response was overwhelming with more than 36 scientists participating in the proceedings. There were 11 presentations covering ground-based measurements of mesospheric and thermospheric emissions using spectrographs, interferometers, photometers and lidars, space based measurements of mesospheric and thermospheric emissions and a discussion on the status of dayglow models.

After a brief introduction on the potential of this area of research by D. Pallamraju (Boston Univ.), J. Meriwether (Clemson Univ.) presented the potential of a new multi-etalon Fabry-Perot interferometer (SOFDI) that is being built at Michigan Aerospace Corporation. It is similar in concept as the HRDI that was flown onboard UARS satellite. It is planned that this instrument would be deployed at Huancayo in Peru in mid 2003 to investigate the low-latitude neutral dynamics. Next S. Solomon (Colorado State Univ.) gave a brief overview on the status of various dayglow models and mentioned that more measurements are needed for bringing out improvements in the existing models.

L. Paxton (John Hopkins Univ.) presented data from the GUVI instrument onboard TIMED which is performing as expected and elucidated the various modes and wavelength regions of observations. He encouraged the community to use this data that is available through their website. Next A. Taori (Utah State Univ.) discussed the mesospheric emission measurements that were made in India and showed that the neutral temperatures derived from them compared well with the measurements obtained on board UARS. J. She (Colorado State Univ.) presented the daytime Sodium lidar measurements and the mesospheric neutral temperatures derived from them. He reported that these temperatures showed a seasonal variability. Continuing on with the topic of lidar measurements, R. Collins (Univ. Alaska) spoke about the efforts initiated at high-latitudes to measure daytime Na lidar measurements. He showed that in contrast to the mid-latitude measurements the temperatures over high-latitudes do not show any seasonal variability. E. Mierkiewicz (Univ. Wisconsin) shared with the community the proposed OH measurements on board Space Shuttle using SHIMMER, a heterodyne system being built at their university. He stated that for UV region this heterodyne technique is ideal. E. Llewellyn (Univ. Saskatchewan) presented OH measurements from OSIRIS instrument onboard ODIN satellite and shared with the community the intriguing nature of these measurements and care needed to interpret such data. He advised exercising caution in using line of sight integrals while using tomographic inversions for obtaining structures in emissions, especially in

limb scans. R. Kerr (Sci. Solutions Inc.) proposed a possible way to use liquid crystal etalons for daytime measurements. They can be tuned electronically for scanning in wavelength. This concept he said would be less expensive than conventional Fabry-Perot interferometers, but the down side of these is that they would not be suitable for nighttime studies. Then, M. Conde (Univ. Alaska) presented some of the measurements they obtained using multiple Fabry-Perot etalons on the red line daytime aurora. By jointly scanning the etalons spatial imaging has been achieved. Finally, D. Pallamraju (Boston Univ.) presented salient features of the HIRISE, a slit spectrograph with imaging capability developed at Boston University. Presently it is capable of making daytime measurements on oxygen red line column emission rates and has been used from low-, mid- and high-latitudes to obtain dayglow and daytime auroral emissions. He presented discussed the future possibilities, both from the point of view of observational campaigns and further developments to the spectrograph.

From the entire cross section of participants it was felt that this was an engrossing and interesting workshop. It was five years ago that such workshop was held in the past. With many new developments in techniques and renewed interest in the community in this area of research it was felt that such a workshop be held periodically.

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CNOFS Equatorial Ionosphere, Bubbles and Scintillation

Conveners: O. de La Beaujardière, Vincent Eccles, S. Basu, K. Groves and Michael Kelley

Two workshops on the CNOFS (Communication and Navigation Outage Forecasting System) Mission were organized to discuss the scientific studies on the ambient equatorial ionosphere, plasma bubbles and radio wave scintillation to be performed during the mission. In the first session held on June 18, 2002, Odile de la Beaujardiere provided an outline of the CNOFS mission. CNOFS is the first equatorial satellite that is dedicated solely to forecasting ionospheric irregularities and ionospheric scintillation. The satellite will be launched in November 2003, in a 13-degree inclination, 700x400-km orbit. Its suite of instruments includes sensors that provide the electric and magnetic fields, the neutral wind and the in situ plasma density. The payload will also include a GPS occultation receiver and a multi-frequency radio beacon. The presence of Richard Behnke of NSF indicated the importance of NSF ground facilities, especially the Jicamarca radar facility, in the CNOFS mission for calibration and validation of satellite sensors. Vince Eccles discussed the technique of data assimilation in ionospheric models from the standpoint of forecasting. Cheryl Huang showed that a good correlation exists between the incidence of plasma bubbles detected by DMSP satellites and ground based VHF scintillation observations near the magnetic equator. John Retterer showed that his model can forecast the onset of equatorial spread-F by using the Jicamarca radar data of electron density profiles and eastward electric fields. Shin-Yi

Su of the National Central University discussed multi-spectral regimes of equatorial irregularities and scintillation modeling from high-resolution (sampling frequency of 1 kHz) plasma density fluctuation data from Taiwan's ROCSAT-1 satellite. The satellite has an inclination of 35 degrees and is in a near circular orbit at 600 km altitude.

The second session, held on June 20, was focused on plasma bubbles and scintillation. Mary Mellott of NASA spoke about the intersections of CNOFS and the NASA missions. Mark Hairston described the neutral wind sensor on CNOFS that has been funded by NASA and Larry Paxton discussed the TIMED satellite data on plasma bubbles that will be complementary to CNOFS. Michael Kelley and his student Jonathan Makela used all-sky imager and GPS scintillation data from Maui to establish the electrodynamic link between the ionosphere over the magnetic equator and the outer fringes of the equatorial anomaly. Mike Keskinen described his recent work on the evolution of equatorial spread-F in three dimensions. Keith Groves used scintillation data from two stations separated in latitude to show that in a majority of cases the delay in the onset of scintillation at the magnetic equator and higher magnetic latitudes becomes apparent only at latitudes higher than 12 degrees. The absence of any delay at lower latitudes raised questions on the upwelling speed of irregularity structures at the magnetic equator and the neutral wind shear. Bela Fejer illustrated the variability of the pre-reversal enhancement of the zonal electric field that critically controls the formation of irregularities. Dave Anderson showed that his pre-

dictive scheme of scintillation onset is working. This is based on digisonde observations of ionospheric height increase in the post-sunset period. Santi Basu listed the crucial parameters that control the growth rate of the Rayleigh-Taylor instability and the space and ground based sensors that can measure these parameters. With the suite of sensors on CNOFS, the deployment of a couple of appropriate digisondes and the existing incoherent scatter radar near the equator, it is expected that the crucial parameters will be tracked for validation of theory and modeling. The audience participated in the discussions and young students were encouraged to speak. Fernanda Sabbas, a graduate student from Brazil at the University of Alaska showed that the CNOFS mission can be supported by an array of observing sites in Brazil that perform airglow, digisonde and GPS scintillation measurements. Fernanda mentioned that CNOFS may also obtain support from the proposed Brazilian low inclination Equatorial Atmosphere Research Satellite (EQUARS) which will have complementary sensors.

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2003 CEDAR Workshop: Approaching Deadlines

1. April 18 for CEDAR workshop convenors to request workshops and send plans, estimates, titles, convenors, and initial ascii (or .htmlt) descriptions to Delores Knipp at delores.knipp@usafa.af.mil. Please send a copy of the titles, convenors and initial descriptions to Barbara Emery at emery@ucar.edu.

2. April 25 for ALL students to send in their registration form and application for funds with biographical information for publication at the workshop to Barbara Emery or via the web (preferred method). Also deadline for advisors to send e-mail certification to emery@ucar.edu that their students are working in an area of CEDAR or WACCM related work. (NOTE: NCAR will not be making any air flight arrangements.)

3. April 25 for students and other interested parties to apply for roommate matching in rooms for 2 or 3 in the Radisson (Raintree Plaza) Hotel. Dorm rooms will not be offered this year since the CSSC felt that students in the dorm were too removed from the conference. CEDAR students in hotel doubles get the difference between that and a hotel triple removed from their air fare reimbursement. The preferred method is via the web

form. (Roommates will be matched by sex and smoking preference, and by check-in and check-out dates.) NCAR will pay for a triple room at the Conference hotel. Non-students can room with students (friends or spouses), but the room can either be paid by NCAR if the form is used, or by the individuals if they call and make their own arrangements. If NCAR pays, then non-students will have to fill in a travel voucher like students in order to pay NCAR for their part of the room. If the individuals pay (including tax), then NCAR will reimburse students \$31/night (excluding tax) after the conference.

4. May 16 for submission of abstracts. An abstract is requested for all invited tutorials and talks, and required for all contributed reports (posters). Abstracts are NOT required for talks in individual afternoon CEDAR Workshops, but are welcome. The preferred method is via the web form.

5. May 15-17 for hotel reservations of reserved CEDAR blocks. (Students should submit the web lodging form due April 25.)

6. By May 23 or 30, all students should have their airline tickets to get good prices with purchase 21 or 14 days in advance of the Workshop for

most non-refundable tickets (unless they can get good fares through other arrangements with their university). NOTE: All students must get their own air fares, either on their own or through their university, which will be refunded to them as soon as possible after the meeting. NCAR will need a photocopy of the official plane ticket receipt, and will ask for it at the workshop in order to expedite travel refunds. Receipts must be requested WHEN ORDERING electronic tickets. Photocopies made BEFORE the meeting and brought with the students will be much appreciated.

7. May 23 registration AND PAYMENT received for the 2003 CEDAR Workshop, after which a late fee of \$50 (\$20 for students) is imposed. (VISA or Mastercard ONLY are accepted credit cards by NCAR.)

8. May 26 for CEDAR workshop presenters to get a final description of their workshop to Barbara Emery emery@ucar.edu. These will replace the initial descriptions on the web and will be printed out for the workshop attendees.

9. May 26 for publication on the web site of the schedule of accepted posters derived from the submitted abstracts.

CEDAR Prize Lecture

The Prize Lecture is the principal means by which the CEDAR community acknowledges outstanding achievement in research. The award honors a colleague whose ideas or results have marked a turning point, initiated a paradigm shift, or have

otherwise significantly contributed to the CEDAR program.

Nominations for the Prize Lecture are solicited yearly from the CEDAR community and should be based on work presented in a peer-reviewed publication. Preference should be

given to work appearing within the previous four years, but earlier work may also be considered. For instance, the Prize Lecture may serve to honor a colleague who has conducted influential research prior to the inception of CEDAR.

2003 PARS Summer School Fairbanks and Gakona, Alaska



Aerial view of the High-Frequency Active Auroral Research Project (HAARP) site in Gakona, Alaska.

The Geophysical Institute of the University of Alaska, Fairbanks will hold a Polar Aeronomy and Radio Science (PARS) Summer School in August 2003, which will provide instruction and hands-on experimental experience for students and their graduate supervisors. This school is supported by the Ionospheric Physics Branch of the Air Force Research Laboratory, the office of Naval Research, and the Upper Atmosphere Program of the National Science Foundation. It will take place partly in the Fairbanks and partly in the Gakona districts of Alaska beginning July 28 and ending August 7. Instructional activities will extend throughout the period with opportunities for hands-on observational experiments at Poker Flat Research Range and at the Gakona Observatory.

The motivation for this summer school is to provide an opportunity for

students to study the upper atmosphere and ionosphere at polar latitudes with practical experience built into the learning process. There is a need for more trained scientists and engineers with knowledge of the special effects that occur in the ionosphere at high latitudes. This summer school is provided to attract students with exceptional talent to become more familiar with this exciting area of study. The theme of the school in 2003 will be ionospheric physics. Instruction will consist of a general introduction to the physics of the ionosphere.

Students are invited to apply for enrollment by submission of a proposal for a project that could be undertaken either at Poker Flat Research Range or Gakona Observatory. The maximum number of students to be accommodated is 20. The application deadline is May 2. Applicants should

use the online application form available here at <http://www.gi.alaska.edu/PARS>. Applications will be ranked according to merit of the proposals submitted. Credit will be given for investigations with a well-defined question to be answered and a plan that offers a good chance of substantial results using the observations to be made during the school. Successful applicants will have their tuition, fees, travel, and living expenses paid for the duration of the school.

The Gakona Observatory is home to a 960 kW High-Frequency radio transmitter and a suite of optical and radio diagnostic instruments. This facility can be used to interact with the local ionosphere to produce small-scale plasma cavities and coherent modulation of the natural electrojet current. Also at Gakona, there is an ionosonde, a riometer, VLF and ELF receivers, a VHF radar, and optical imagers and photometers. Two of the panels that will be used to construct the NSF AMISR is planned to be located at Gakona during the school. At Poker Flat, a mesospheric lidar will be available. In addition, the SuperDARN radar at Kodiak, Alaska, will be available for experiments.

During August, 2000, 2001, and 2002, similar schools were held in Fairbanks and Gakona. The images posted on the website show the students and faculty at work (and play) during the school. The schedule for the school includes class time and experiment time, but provides opportunity for the participants to enjoy some of the recreational activities available in Alaska.

Bill Bristow, GI-UAF

2002 CEDAR Workshop Pictorial Part 2



Participants of the 2002 CEDAR Workshop in Longmont, Colorado enjoyed a healthy mix of presentation, discussion, social activities and outdoor recreation. This year's workshop (June 15-20) will once again take place at the Radisson (formerly Raintree) Hotel in Longmont. Among the scheduled events are a student social on Sunday and optional attendance at one of two theater productions in nearby Fort Collins.



Clockwise from top: TIMED Project Manager Sam Yee presents; Joe Salah and Shengpan Zhang of Millstone Hill chat with Steve Smith of Boston University and Ron Clark of the University of New Hampshire; Art Richmond of the National Center for Atmospheric Research chats with a group of students near the volleyball pit; the winning "blue" volleyball team from the student social on Sunday. From left are Jeff Martin (University of Miami), Martin Rodgers (University of Miami/Arecibo Observatory), Kristina Thomas (University of Southern Utah), Rob Siegel (Pennsylvania State University) and Dan Kao (Pennsylvania State University).



Photos by Barbara Emery

CEDAR Highlights Selected by the Steering Committee

Highlight title
Measurement of momentum and energy flux into the mesosphere
Ionospheric tomography
Topside ionosphere (plasma temperature), light ion distribution, geocoronal hydrogen variation
He imaging and midlatitude storm effects - penetration of E fields from inner magnetosphere
Temporal/spatial behavior of irregularities in equatorial region
New understanding of perpendicular temperatures in ISR
Daytime airglow studies of ionospheric structures
MI coupling - connection between ionospheric conductance and auroral precipitation
Recognition of small scale structures in E fields on Joule heating
3-D instability modeling of evolution of high latitude patches
Development of coupled models eg. CTIP and TIME-GCM and WACCM and Polar Wind models
Effect of meteor impact on ionospheric structures, winds, composition
Sprites and jets
Advances made by high speed imagers
Tidal/planetary waves and non-migrating tides
Mesospheric inversion layers - gravity wave tidal interaction
Direct driving of ionosphere by solar wind E field variation
Midlatitude Es - new progress and midlatitude rocket campaign
Thermospheric wind structures in horizontal and vertical components
Anomalies and creation of equatorial spread F
Simulation of weather creates new challenges for modelers
Data assimilation creates large scale data views with improving temporal and spatial resolution
Daytime lidar studies

CEDAR Meetings Calendar 2002-2004

CONFERENCE	DATE	LOCATION	ORGANIZATION	CONTACT INFO
EGS/AGU Joint Assembly	April 6-11, 2003	Nice, France	EUG	http://www.copernicus.org/egsagueug/index.html
International Workshop on Technical and Scientific Aspects (MST-10)	May 13-20, 2003	Piura, Peru		http://jro.igp.gob.pe/mst10
Space Weather Week 2003	May 19-22, 2003	Boulder, Colorado	NOAA/SEC	http://www.sec.noaa.gov/sww
2003 CEDAR Workshop	June 15-20, 2003	Longmont, Colorado	CEDAR NSF	http://cedarweb.hao.ucar.edu/wkshp/
2003 GEM Workshop	June 22-27, 2003	Snowmass, Colorado	GEM NSF	http://spacesun.rice.edu/~gem/
ISCS Symposium 2003: Solar Variability as an Input to the Earth's Environment	June 23-28, 2003	Tatranska, Lomnica Slovak Republic	ISCS	http://www.astro.sk/iscs2003
IUGG Assembly	June 30-July 11 2003	Sapporo, Japan	IUGG	http://www.jamstec.go.jp/jamstec-e/iugg/
2003 SHINE Workshop	July 6-11, 2003	Maui, Hawaii	SHINE NSF	http://www.shinegroup.org
International Incoherent Scatter School and Workshop	August 22-29, 2003	Menlo Park, California	EISCAT	http://isr.sri.com/eiscat2003/
URSI/COSPAR International Reference Ionosphere Workshop	October 6-10, 2003	Grahamstown, South Africa	URSI	http://phlinus.ru.ac.za/hoai/IRI2003
Conference of the Latin American Association of Space Geophysics	October, 2003	Cuzco, Peru	ALAGE	NA
AGU Fall Meeting	December 11-15, 2003	San Francisco, California USA	AGU	http://www.agu.org
EGS XXIX General Assembly	April 26-30, 2004	undetermined	EGS	http://www.copernicus.org/EGS
XXVIII SCAR Assembly	July ??, 2004	Bremerhaven, Germany	ICSU/SCAR	http://www.scar.org

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News on CEDAR Workshop Location for 2004

The 2004 CEDAR Workshop will be held in Santa Fe, New Mexico, at the El Dorado Hotel (<http://www.eldoradohotel.com>) from Sunday to Friday, June 27 to July 2. We also anticipate holding a joint CEDAR-GEM workshop in Santa Fe between June 26 and July 1 in 2005.

Santa Fe's First four-star, four-diamond hotel.

Located next to the historic Santa Fe Plaza.



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Fairbanks, Alaska
Permit No. 8

The CEDAR Post is published three times a year and is mailed to more than 1200 scientists worldwide.

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