Extended Text for use in Journals:

EXPLANATIONS

This Calendar continues the series begun for the IGY years 1957-58, and is issued annually to recommend dates for solar and geophysical observations which cannot be carried out continuously. Thus, the amount of observational data in existence tends to be larger on Calendar days. The recommendations on data reduction and especially the flow of data to World Data Centers (WDCs) in many instances emphasize Calendar days. The Calendar is prepared by the International Ursigram and World Days Service (IUWDS) with the advice of spokesmen for the various scientific disciplines. For some programs, greater detail concerning recommendations appears from time to time published in IAGA News, IUGG Chronicle, URSI Information Bulletin or other scientific journals or newsletters. For on-line information, see http://www.sel.noaa.gov/iuwds/iuwds.html.

The definitions of the designated days remain as described on previous Calendars. Universal Time (UT) is the standard time for all world days. Regular Geophysical Days (RGD) are each Wednesday. Regular World Days (RWD) are three consecutive days each month (always Tuesday, Wednesday and Thursday near the middle of the month). Priority Regular World Days (PRWD) are the RWD which fall on Wednesdays. Quarterly World Days (QWD) are one day each quarter and are the PRWD which fall in the World Geophysical Intervals (WGI). The WGI are fourteen consecutive days in each season, beginning on Monday of the selected month, and normally shift from year to year. In 1996 the WGI will be March, June, September and December.

The Solar Eclipses are:

a.) 17-18 April 1996 (partial) is visible from New Zealand, except for the northern part of its northern island. Its other landfalls are parts of Antarctica--Victoria Land and Marie Byrd Land. The partial eclipse is also visible from much of the South Pacific Ocean east of New Zealand, with a maximum of 88% of the sun's diameter covered. Greatest eclipse occurs at 2237 UT. Tahiti is near the edge of this zone, with the sun barely eclipsed--
3.9% (16% at Christchurch, NZ).

b.) 12 October 1996 (partial) will be visible from extreme northern Maine, northeast Canada (almost all of New Brunswick, northeastern Nova Scotia, Newfoundland, Labrador, northern Quebec, northern Ontario, and eastern Northwest Territories), Greenland, Iceland, Europe (including the British Isles), and North Africa. Maximum eclipse occurs at 1402 UT. At most, 76% of the sun's diameter will be covered (4% at Charlottetown, PEI, Canada, 16% at St. John's, NF, Canada, 63% in Amsterdam, 72% in Helsinki, 61% in London, and 59% in Paris). (Descriptions by Dr. Jay M. Pasachoff, Williams College (jmp@williams.edu)--Hopkins Observatory, Chair of the Working Group on Eclipses of the International Astronomical Union, based on "Fifty-Year Canon of Solar Eclipses: 1986-2035," by Fred Espenak, NASA Goddard Space Flight Center, NASA Reference Publication 1178 Revised.)

Meteor Showers (selected by R. Hawkes, Mount Allison Univ, Canada, rhawkes@mta.ca) include the most prominent regular showers. The dates for Northern Hemisphere meteor showers are: Jan 3-5 (Quadrantid); Apr 21-23 (Lyrid); May 3-6 (Eta-Aquarid); Jun 6-11 (Arietid, Zeta-Perseid); Jun 27-29 (Beta-Taurid); Aug 11-14 (Perseid); Oct 21-23 (Orionid); Nov16-19 (Leonid); Dec 13-15 (Geminid); Dec 22-23, 1996 (Ursid); and Jan 3-5, 1997 (Quadrantid). The dates for Southern Hemisphere meteor showers are: May 3-6 (Eta-Aquarid); Jun 6-11 (Arietid, Zeta-Perseid); Jun 27-29 (Beta-Taurid); Jul 28-31 (S. Delta-Aquarid, Alpha-Aurigid); Oct 21-23 (Orionid); Nov 16-19 (Leonid); and Dec 13-15, 1996 (Geminid). Particular attention is drawn to observations of the Leonid shower as part of the International Leonid Watch which will continue throughout the decade.

The occurrence of unusual solar or geophysical conditions is announced or forecast by the IUWDS through various types of geophysical "Alerts" (which are widely distributed by telegram and radio broadcast on a current schedule). Stratospheric warmings (STRATWARM) are also designated. The meteorological telecommunications network coordinated by WMO carries these worldwide Alerts once daily soon after 0400 UT. For definitions of Alerts see IUWDS "Synoptic Codes for Solar and Geophysical Data", March 1990 and its amendments. Retrospective World Intervals are selected and announced by MONSEE and elsewhere to provide additional analyzed data for particular events studied in the ICSU Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) programs.

RECOMMENDED SCIENTIFIC PROGRAMS

OPERATIONAL EDITION

(The following material was reviewed in 1995 by spokesmen of IAGA, WMO and URSI as suitable for coordinated geophysical programs in 1996.)

Airglow and Aurora Phenomena. Airglow and auroral observatories operate with their full capacity around the New Moon periods. However, for progress in understanding the mechanism of many phenomena, such as low latitude aurora, the coordinated use of all available techniques, optical and radio, from the ground and in space is required. Thus, for the airglow and aurora 7-day periods on the Calendar, ionosonde, incoherent scatter, special satellite or balloon observations, etc., are especially encouraged. Periods of approximately one weeks' duration centered on the New Moon are proposed for high resolution of ionospheric, auroral and magnetospheric observations at high latitudes during northern winter.

Atmospheric Electricity. Non-continuous measurements and data reduction for continuous measurements of atmospheric electric current density, field, conductivities, space charges, ion number densities, ionosphere potentials, condensation nuclei, etc.; both at ground as well as with radiosondes, aircraft, rockets; should be done with first priority on the RGD each

Wednesday, beginning on 3 January 1996 at 0000 UT, 10 January at 0600 UT, 17 January at 1200 UT, 24 January at 1800 UT, etc. (beginning hour shifts six hours each week, but is always on Wednesday). Minimum program is at the same time on PRWD beginning with 17 January at 1200 UT. Data reduction for continuous measurements should be extended, if possible, to cover at least the full RGD including, in addition, at least 6 hours prior to indicated beginning time. Measurements prohibited by bad weather should be done 24 hours later. Results on sferics and ELF are wanted with first priority for the same hours, short-period measurements centered around the minutes 35-50 of the hours indicated. Priority Weeks are the weeks which contain a PRWD; minimum priority weeks are the ones with a QWD. The World Data Centre for Atmospheric Electricity, 7 Karbysheva, St. Petersburg 194018, USSR, is the collection point for data and information on measurements.

Geomagnetic Phenomena. It has always been a leading principle for geomagnetic observatories that operations should be as continuous as possible and the great majority of stations undertake the same program without regard to the Calendar. Stations equipped for making magnetic observations, but which cannot carry out such observations and reductions on a continuous schedule are encouraged to carry out such work at least on RWD (and during times of MAGSTORM Alert).

Ionospheric Phenomena. Special attention is continuing on particular events which cannot be forecast in advance with reasonable certainty. These will be identified by Retrospective World Intervals. The importance of obtaining full observational coverage is therefore stressed even if it is possible to analyze the detailed data only for the chosen events. In the case of vertical incidence sounding, the need to obtain quarter-hourly ionograms at as many stations as possible is particularly stressed and takes priority over recommendation (a) below when both are not practical.

For the vertical incidence (VI) sounding program, the summary recommendations are: (a) All stations should make soundings on the hour and every quarter hour; (b) On RWDs, ionogram soundings should be made at least every quarter hour and preferably every five minutes or more frequently, particularly at high latitudes; (c) All stations are encouraged to make f-plots on RWDs; f-plots should be made for high latitude stations, and for so-called "representative" stations at lower latitudes for all days (i.e., including RWDs and WGIs) (Continuous records of ionospheric parameters are acceptable in place of f-plots at temperate and low latitude stations); (d) Copies of hourly ionograms with appropriate scales for QWDs are to be sent to WDCs; (e) Stations in the eclipse zone and its conjugate area should take continuous observations on solar eclipse days and special observations on adjacent days. See also recommendations under Airglow and Aurora Phenomena.

For the incoherent scatter observation program, every effort should be made to obtain measurements at least on the Incoherent Scatter Coordinated Observation Days, and intensive series should be attempted whenever possible in WGIs, on Dark Moon Geophysical Days (DMGD) or the Airglow and Aurora Periods. The need for collateral VI observations with

not more than quarter-hourly spacing at least during all observation periods is stressed. Special programs include:

CADITS/MLTCS/ABC -- Coupling and Dynamics of the Ionosphere-Thermosphere System/Mesosphere, Lower-Thermosphere Coupling Study -- combined local E and F region measurements, including vector velocities, with 15 minute time resolution. Latitudinal coverage may be sacrificed to meet this goal. The goal of ABC is to look for predictors to equatorial spread-F effects that can be sensed PRIOR to actual onset times, i.e., from the pre-sunset to pre-midnight period;

DATABASE -- Incoherent Scatter Database -- emphasis on broad latitudinal coverage of the F region;

FAST -- Fast Auroral Snapshot -- coordinated FAST satellite observations with GISMOS;

GISMOS -- Global Ionospheric Simultaneous Measurements of Substorms -- wide latitudinal coverage of convection with highest possible time resolution;

JOULE -- coordinated radar/ground-based optics/satellite (MSX) campaign to measure Joule heating and its effects on the atmosphere;

MISETA -- Equatorial Dynamics -- The MISETA-2 campaign has as its goal the study of the onset and evolution of equatorial spread-F effects under Vernal Equinox conditions. Local E and F region measurements will be included;

POLITE -- Plasmaspheric Observations of Light Ions in the Topside Exosphere -- global coordinated measurements of topside light ions. Simultaneous optical observations of neutral hydrogen and helium are highly desirable where possible.;

SUNDIAL -- Weather and climatology of the global ionospheric-thermospheric system. Full 30 day round-the-clock ionosonde coverage of E- and F-region characteristics including intermediate, descending and sequential layers.

Special programs: Dr. J. Holt, M.I.T. Haystack Observatory, Route 40, Westford, MA 01886 U.S.A., URSI Working Group G.5. Phone (617)981-5625, jmh@chaos.haystack.edu.

For the ionospheric drift or wind measurement by the various radio techniques, observations are recommended to be concentrated on the weeks including RWDs.

For traveling ionosphere disturbances, propose special periods for coordinated measurements of gravity waves induced by magnetospheric activity, probably on selected PRWD and RWD.

For the ionospheric absorption program half-hourly observations are made at least on all RWDs and half-hourly tabulations sent to WDCs. Observations should be continuous on solar eclipse days for stations in eclipse zone and in its conjugate area. Special efforts should be made to obtain daily absorption measurements at temperate latitude stations during the period of Absorption Winter Anomaly, particularly on days of abnormally high or abnormally low absorption (approximately October-March, Northern Hemisphere; April-September, Southern Hemisphere).

For back-scatter and forward scatter programs, observations should be made and analyzed on all RWDs at least.

For synoptic observations of mesospheric (D region) electron densities, several groups have agreed on using the RGD for the hours around noon.

For ELF noise measurements involving the earth-ionosphere cavity resonances any special effort should be concentrated during the WGIs.

It is recommended that more intensive observations in all programs be considered on days of unusual meteor activity.

Meteorology. Particular efforts should be made to carry out an intensified program on the RGD -- each Wednesday, UT. A desirable goal would be the scheduling of meteorological rocketsondes, ozone sondes and radiometer sondes on these days, together with maximum-altitude rawinsonde ascents at both 0000 and 1200 UT.

During WGI and STRATWARM Alert Intervals, intensified programs are also desirable, preferably by the implementation of RGD-type programs (see above) on Mondays and Fridays, as well as on Wednesdays.

Global Atmosphere Watch (GAW). The World Meteorological Organizations (WMO) GAW integrates many monitoring and research activities involving measurement of atmospheric composition. Serves as an early warning system to detect further changes in atmospheric concentrations of greenhouse gases, changes in the ozone layer and in the long range transport of pollutants, including acidity and toxicity of rain as well as of atmospheric burden of aerosols (dirt and dust particles). Contact WMO, 41, avenue Giuseppe-Motta, P.O. Box 2300, 1211 Geneva 2, Switzerland.

Solar Phenomena. Observatories making specialized studies of solar phenomena, particularly using new or complex techniques, such that continuous observation or reporting is impractical, are requested to make special efforts to provide to WDCs data for solar eclipse days, RWDs and during PROTON/FLARE ALERTS. The attention of those recording solar noise spectra, solar magnetic fields and doing specialized optical studies is particularly drawn to this recommendation.

FLARES22(FLAre RESearch at the maximum of solar cycle 22). 1990-1997 worldwide Solar-Terrestrial Energy Program (STEP) project. Aimed at understanding basic physical processes of transient solar activity and its coupling with the solar-terrestrial environment, including times of the various solar ALERTS.

Coordinates satellite and ground-based observations. Observational campaigns are driven by specific scientific objectives rather than observations per se. Satellites include SOLAR-A, GRO, CORONAS, WIND, GEOTAIL, ULYSSES, etc. Program will focus on international collaboration of data analyses and theoretical work via electronic mail and workshops. For more information, contact Dr. Mona J. Hagyard, Marshall Space Flight

Center, Code ES52, Huntsville, AL 35812. 205-544-7612; e-mail mhagyard@solar.stanford.edu.

SOLTIP (SOlar connection with Transient Interplanetary Processes). Program within the SCOSTEP STEP (Solar-Terrestrial Energy Program) project: 1990-1997. Its focus is on remote and in situ observations and analyses of solar-generated phenomena and their propagation throughout the heliosphere, including times following the various solar ALERTS. Desired goals include: (1) interplanetary scintillation observation of remote radio galaxies as well as telemetry signals to/from interplanetary spacecraft; (2) coordination of Earth-orbiting spacecraft such as IMP-8 in the solar wind and solar-orbiting spacecraft such as ICE, GIOTTO, SAKIGAKE, VOYAGER 1/2, PIONEER 10/11, ULYSSES, RELICT, WIND, SOHO, Galileo, and ACE. Contact is Dr. M. Dryer, NOAA R/E/SE, 325 Broadway, Boulder, CO 80303 USA. Phone: (303)497-3978; FAX number (303)497-3645; e-mail address mdryer@sel.noaa.gov.

Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy. Experimenters should take into account that observational effort in other disciplines tends to be intensified on the days marked on the Calendar, and schedule balloon and rocket experiments accordingly if there are no other geophysical reasons for choice. In particular it is desirable to make rocket measurements of ionospheric characteristics on the same day at as many locations as possible; where feasible, experimenters should endeavor to launch rockets to monitor at least normal conditions on the Quarterly World Days (QWD) or on RWDs, since these are also days when there will be maximum support from ground observations. Also, special efforts should be made to assure recording of telemetry on QWD and Airglow and Aurora Periods of experiments onsatellites and of experiments on spacecraft in orbit around the Sun.

The International Ursigram and World Days Service (IUWDS) is a permanent scientific service of the International Union of Radio Science (URSI), with the participation of the International Astronomical Union and the International Union Geodesy and Geophysics. IUWDS adheres to the Federation of Astronomical and Geophysical Data Analysis Services (FAGS) of the International Council of Scientific Unions (ICSU). The IUWDS coordinates the international aspects of the world days program and rapid data interchange.

This Calendar for 1996 has been drawn up by H.E. Coffey, of the IUWDS Steering Committee, in association with spokesmen for the various scientific disciplines in SCOSTEP, IAGA and URSI and other ICSU organizations. Similar Calendars are issued annually beginning with the IGY, 1957-58, and are published in various widely available scientific publications.

Published for the International Council of Scientific Unions and with financial assistance of UNESCO.

Additional copies are available upon request to IUWDS Chairman, Dr. R. Thompson, IPS Radio and Space Services, Department of Administrative Services, P.O. Box 5606, West Chatswood, NSW 2057, Australia (FAX number

(61)(2)414 8331; e-mail richard@ips.gov.au), or IUWDS Secretary for World Days, Miss H.E. Coffey, WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder, Colorado 80303, USA (FAX number (303)497-6513; e-mail hcoffey@ngdc.noaa.gov).

This calendar is available on-line at http://www.sel.noaa.gov/iuwds/iuwds.html.