

International Geophysical Calendar 2010 (FINAL)

(See information on use of this Calendar)

	S	M	T	W	T	F	S		S	M	T	W	T	F	S	
JANUARY							1	2					1	2	3	JULY
	3	4	5	6	7	8	9		4	5	6 ⁺	7 ⁺	8	9	10	
	10	11	12	13	14	15 ^N	16		11 ^N	12	13 [*]	14 [*]	15	16	17	
	17	18	19 [*]	20 [*]	21	22	23		18	19	20	21	22	23	24	
	24	25	26	27	28	29	30 ^F		25	26 ^F	27	28	29	30	31	
	31	1	2	3	4	5	6		1	2	3	4	5	6	7	AUGUST
FEBRUARY	7	8	9	10	11	12	13		8	9	10 ^{N+}	11 [*]	12	13	14	
	14 ^N	15	16 [*]	17	18	19	20		15	16	17	18 ⁺	19	20	21	
	21	22	23	24	25	26	27		22	23	24 ^F	25	26	27	28	
	28 ^F	1	2	3	4	5	6		29	30	31	1	2	3	4	SEPTEMBER
MARCH	7	8	9 ⁺	10 ⁺	11 ⁺	12	13		5	6	7 ⁺	8 ^{N+}	9 ⁺	10	11	
	14	15 ^N	16 [*]	17 [*]	18	19	20		12	13	14 [*]	15 [*]	16	17	18	
	21	22	23	24	25	26	27		19	20	21	22	23 ^F	24	25	
	28	29	30 ^F	31	1	2	3		26	27	28	29	30	1	2	
APRIL	4	5	6	7	8	9	10		3	4	5 ⁺	6 ⁺	7 ^N	8	9	OCTOBER
	11	12	13 [*]	14 ^{N+}	15	16	17		10	11	12 [*]	13 [*]	14	15	16	
	18	19	20	21	22	23	24		17	18	19	20	21	22	23 ^F	
	25	26	27	28 ^F	29	30	1		24	25	26	27	28	29	30	
MAY	2	3	4	5	6	7	8		31	1	2	3	4	5	6 ^N	NOVEMBER
	9	10 ⁺	11 ⁺	12 [*]	13 [*]	14 ^N	15		7	8 ⁺	9 ⁺	10	11	12	13	
	16	17	18	19	20	21	22		14	15	16 [*]	17 [*]	18	19	20	
	23	24	25	26	27 ^F	28	29		21 ^F	22	23	24	25	26	27	
	30	31	1	2	3	4	5		28	29	30	1	2	3	4	DECEMBER
JUNE	6	7	8	9	10	11	12 ^N		5 ^N	6	7 ⁺	8 ⁺	9 ⁺	10	11	
	13	14	15 ⁺	16 ⁺	17 ⁺	18	19		12	13	14	15	16	17	18	
	20	21	22	23	24	25	26 ^F		19	20	21 ^F	22	23	24	25	
	27	28	29	30					26	27	28	29	30	31	1	
									2	3	4 ^N	5	6	7	8	2011 JANUARY
									9	10	11 [*]	12 [*]	13	14	15	
									16	17	18	19 ^F	20	21	22	
									23	24	25	26	27	28	29	
									30	31						
									S	M	T	W	T	F	S	

① Regular World Day (RWD)

① Priority Regular World Day (PRWD)

② Quarterly World Day (QWD)

also a PRWD and RWD

6 Regular Geophysical Day (RGD)

11 12 World Geophysical Interval (WGI)

⁺ Incoherent Scatter Coordinated Observation Day

N NEW MOON F FULL MOON

15 Days of Solar Eclipse: Jan 15 (annular) & Jul 11 (total)

14 15 Airglow and Aurora Period

19* Dark Moon Geophysical Day (DMGD)

NOTES on other dates and programs of interest:

1. Days with significant meteor shower activity (based on UT in year 2010) — regular meteor showers: Jan 1-6; Apr 16-25; Apr 19-May 28; May 22-Jul 2; May 20-Jul 5; Jun 5-Jul 17; Jul 8-Aug 19; Jul 17-Aug 24; Sep 26-Oct 3; Oct 2-Nov 7; Oct 31-Nov 23; Nov 27-Dec 18; Dec 17-26. These can be studied for their own geophysical effects or may be “geophysical noise” to other experiments. (pjenniskens@mail.arc.nasa.gov)
2. GAW (Global Atmosphere Watch) -- early warning system for changes in greenhouse gases, ozone layer, and long range transport of pollutants -- http://www.wmo.ch/web/arep/gaw/gaw_home.html. (See Explanations.)
3. CAUSES (Climate and Weather of the Sun-Earth System) — SCOSTEP Program 2004-2008+. Theme areas: Solar Influence on Climate; Space Weather: Science and Applications; Atmospheric Coupling Processes; Space Climatology; and Capacity Building and Education. <http://www.bu.edu/causes> (See Explanations.) (S. Avery –susan.avery@colorado.edu)
4. ILWS (International Living With a Star) Program – International effort to stimulate, strengthen, and coordinate space research to understand the governing processes of the connected Sun-Earth System as an integrated entity. See <http://ilws.gsfc.nasa.gov/>.
5. + Incoherent Scatter Coordinated Observations Days (see Explanations) starting at 1300 UT on the first day of the intervals indicated, and ending at 2000 UT on the last day of the intervals (minimum 31 hours observations: Jan 15-31 Alert for Stratospheric warmings; Feb 1-15 – same as January; Mar 9-11 QPTIDs; Apr 13 SolarMin; May 10 SolarMin; Jun 15-16 Topside; Jul 6 SolarMin; Aug 10 SolarMin; Sep 7-8 TopSide; Oct 5 SolarMin; Nov 8 SolarMin; Dec 7-8 Topside).

See <http://e7.eiscat.se/Members/ingemar/skedule/WD2010.htm/view?searchterm=2010%20Incoherent%20Scatter%20Coordinated>

where **SolarMin** = To cover the end of the unique extreme solar minimum (Anthony.vaneyken@sri.com and ingemar@eiscat.se);

Stratospheric Warmings = Dynamics of lower thermosphere during stratospheric warming (L. Goncharenko -- lpg@haystack.mit.edu);

TopSide = Lat and Alt Variability of Topside Ionosphere (frodrigues@astraspace.net and Michael.nicolls@sri.com)

QP TIDs = Quasi-Periodic Traveling Ionospheric Disturbances-extended lat coverage (JDMathews@psu.edu)

AO = Arecibo Obs (<http://www.naic.edu/~isradar/is/ishome.html>) Incoherent Scatter Radar (ISR);

JRO = Jicamarca Radio Obs (http://jro.igp.gob.pe/english/radar/operation/real-time_en.php);

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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 Space Environment Service (ISES)** with the advice of spokesmen for the various scientific disciplines.

The **Solar Eclipses** are:

a.) 15 January 2010, annular eclipse, crosses Africa, Indian Ocean, and Asia. Best observing extreme southern India, northern Sri Lanka, extreme southern Bangladesh, extreme northern Myanmar, and China (up to Qingdao). Partial phases in eastern Europe, Africa except extreme west and Cape Town extreme south, and Asia up to eastern Japan and middle of Java.

b.) 11 July 2010, total solar eclipse, crosses the Pacific, hitting land at Easter Island (Chile), then is low in sky on southern Chilean coast. Seen by boat from southern Pacific islands, especially south of French Polynesia. Small island Tatkoto is near centerline, as well as Kikueru and Tauere in the Tuamotu Islands. Path crosses Pacific Ocean south of Cook Island and crosses Oneroa and Ivirua. Partial phases near sunset reach Peru, Bolivia, Chile, Argentina, Uruguay, Paraguay and southern Brazil.

(Information provided by Jay M. Pasachoff, IAU Working Group on Eclipses, based on maps by Fred Espenak, NASA's Goddard Space Flight Center and from Peterson Field Guide to the Stars and Planets (Pasachoff input). See <http://www.eclipses.info>.

Meteor Showers (selected by P. Jenniskens, SETI Institute, Mountain View, CA, pjenniskens@mail.arc.nasa.gov) include important visual showers and also unusual showers observable mainly by radio and radar techniques. The dates are given in Note 1 under the Calendar. See extended text for more details.

Definitions:

	Time	= Universal Time (UT);
Regular Geophysical Days (RGD)		= each Wednesday;
Regular World Days (RWD)		= Tuesday, Wednesday and Thursday near the middle of the month (see calendar);
Priority Regular World Days (PRWD)		= the Wednesday RWD;
Quarterly World Days (QWD)		= PRWD in the WGI;
World Geophysical Intervals (WGI)		= 14 consecutive days each season (see calendar);
ALERTS		= occurrence of unusual solar or geophysical conditions, broadcast once daily soon after 0400 UT;
STRATWARM		= stratospheric warmings;
Retrospective World Intervals (RWI)		= MONSEE study intervals

For more detailed explanations of the definitions, please visit <http://www.ngdc.noaa.gov/stp/SOLAR/IGCwebpage5.html> or contact H. Coffey or <http://www.ises-spaceweather.org/>.

Priority recommended programs for measurements not made continuously (in addition to unusual ALERT periods):

Aurora and Airglow — Observation periods are New Moon periods, especially the 7 day intervals on the calendar;

Atmospheric Electricity — Observation periods are the RGD each Wednesday, beginning on 6 January 2010 at 0000 UT, 13 January at 0600 UT, 20 January at 1200 UT, 27 January at 1800 UT, etc. Minimum program is PRWDs.

Geomagnetic Phenomena — At the minimum, need observation periods and data reduction on RWDS and during MAGSTORM Alerts.

Ionospheric Phenomena — Quarter-hourly ionograms; more frequently on RWDS, particularly at high latitude sites; f-plots on RWDS; hourly ionogram scaled parameters to WDCs on QWDS; continuous observations for solar eclipse in the eclipse zone. See Airglow and Aurora.

Incoherent Scatter — Observations on Incoherent Scatter Coordinated Days; also intensive series on WGI or Airglow and Aurora periods.

Special programs: Dr. Ingemar Haggstrom, EISCAT, Box 812, SE-98128 Kiruna, Sweden; tel: +46 98079155; Fax: +46 98079159; email ingemar@eiscat.se. URSI Working Group G.5. See

<http://e7.eiscat.se/Members/ingemar/schedule/WD2010.htm/view?searchterm=2010%20Incoherent%20Scatter%20Coordinated>

Ionospheric Drifts — During weeks with RWDS.

Traveling Ionosphere Disturbances — special periods, probably PRWD or RWDS.

Ionospheric Absorption — Half-hourly on RWDS; continuous on solar eclipse days for stations in eclipse zone and conjugate area. Daily measurements during Absorption Winter Anomaly at temperate latitude stations (Oct-Mar Northern Hemisphere; Apr-Sep Southern Hemisphere).

Backscatter and Forward Scatter — RWDS at least.

Mesospheric D region electron densities — RGD around noon.

ELF Noise Measurements of earth-ionosphere cavity resonances — WGI.

All Programs — Appropriate intensive observations during unusual meteor activity.

Meteorology — Especially on RGDs. On WGI and STRATWARM Alert Intervals, please monitor on Mondays and Fridays as well as Wednesdays.

GAW (Global Atmosphere Watch) -- WMO program to integrate monitoring of atmospheric composition. Early warning system of changes in atmospheric concentrations of greenhouse gases, ozone, and pollutants (acid rain and dust particles). WMO, 41 avenue Giuseppe-Motta, P.O. Box 2300, 1211 Geneva 2, Switzerland.

Solar Phenomena — Solar eclipse days, RWDS, and during PROTONFLARE ALERTS.

CAWSES (Climate and Weather of the Sun-Earth System) -- SCOSTEP Program 2004-2008+. Focus on fully utilizing past, present, and future data; and improving space weather forecasting, the design of space- and Earth-based technological systems, and understanding the solar-terrestrial influences on Global Change. Contact is Susan Avery (susan.avery@colorado.edu), Chair of CAWSES Science Steering Group. Program "theme" areas: Solar Influence on Climate; Space Weather: Science and Applications; Atmospheric Coupling Processes; Space Climatology; and Capacity Building and Education. See <http://www.bu.edu/cawses/>.

ILWS (International Living With a Star) — International effort to stimulate, strengthen, and coordinate space research to understand the governing processes of the connected Sun-Earth System as an integrated entity. Contact M. Gukathakurta at madhulika.guhathakurta@nasa.gov -- <http://ilws.gsfc.nasa.gov/>.

Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy — QWDS, RWD, Airglow and Aurora periods.

The **International Space Environment Service (ISES)** is a permanent scientific service of the International Union of Radio Science (URSI), with the participation of the International Astronomical Union (IAU) and the International Union of Geodesy and Geophysics (IUGG). ISES adheres to the Federation of Astronomical and Geophysical Data Analysis Services (FAGS) of the International Council for Science (ICSU). The ISES coordinates the international aspects of the world days program and rapid data interchange.

This Calendar for 2010 has been drawn up by H.E. Coffey, of the ISES Steering Committee, in association with spokesmen for the various scientific disciplines in SCOSTEP, IAGA, 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. PDF versions are available online at ftp://ftp.ngdc.noaa.gov/STP/SOLAR_DATA/IGC_CALENDAR.

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Copies of earlier years' calendars are available upon request to either ISES Director, Dr. David Boteler, Geomagnetic Laboratory, Natural Resources Canada, 7 Observatory Crescent, Ottawa, Ontario, Canada, K1A 0Y3, FAX (613)824-9803, e-mail dboteler@NRCan.gc.ca, or contact ISES Secretary for World Days, Ms. Helen Coffey, e-mail hecoffey799@aol.com. Beginning with the 2008 Calendar, all calendars are available only in digital format.

Calendar information is available on-line at <http://www.ises-spaceweather.org/>. The International Geophysical Calendar and descriptive text is also available online at <http://www.ngdc.noaa.gov/stp/SOLAR/IGCwebpage5.html>.