

# International Geophysical Calendar 2013 (FINAL)

(See information to follow on the use of this Calendar)

	S	M	T	W	T	F	S		S	M	T	W	T	F	S	
JANUARY			1	2	3	4	5			1	2	3	4	5	6	JULY
	6	7	8	9	10	11 <sup>N</sup>	12		7	8 <sup>N</sup>	9 <sup>+</sup>	10 <sup>+</sup>	11 <sup>+</sup>	12 <sup>+</sup>	13	AUGUST
	13	14	15*	16*	17 <sup>+</sup>	18 <sup>+</sup>	19 <sup>+</sup>		14	15	16	17	18	19	20	
	20 <sup>+</sup>	21 <sup>+</sup>	22 <sup>+</sup>	23 <sup>+</sup>	24 <sup>+</sup>	25 <sup>+</sup>	26 <sup>+</sup>		21	22 <sup>F</sup>	23	24	25	26	27	
FEBRUARY	27 <sup>F</sup>	28 <sup>+</sup>	29 <sup>+</sup>	30 <sup>+</sup>	31 <sup>+</sup>	1 <sup>+</sup>	2 <sup>+</sup>		28	29	30	31	1	2	3	
	3 <sup>+</sup>	4 <sup>+</sup>	5 <sup>+</sup>	6 <sup>+</sup>	7 <sup>+</sup>	8 <sup>+</sup>	9 <sup>+</sup>		4	5	6 <sup>N*</sup>	7 <sup>*</sup>	8	9	10	
	10 <sup>N</sup>	11 <sup>+</sup>	12*	13*	14 <sup>+</sup>	15 <sup>+</sup>	16 <sup>+</sup>		11	12	13	14	15	16	17	
	17	18	19	20	21	22	23		18	19	20	21 <sup>F</sup>	22	23	24	
	24	25 <sup>F</sup>	26	27	28	1	2		25	26	27	28	29	30	31	
MARCH	3	4	5	6	7	8	9		1	2	3	4 <sup>*</sup>	5 <sup>N</sup>	6	7	SEPTEMBER
	10	11 <sup>N</sup>	12*	13*	14	15	16		8	9	10	11	12	13	14	
	17	18	19	20	21	22	23		15	16	17	18	19 <sup>F</sup>	20	21	
	24	25	26	27 <sup>F</sup>	28	29	30		22	23	24	25	26	27	28	
	31	1	2	3	4	5	6		29	30	1	2	3	4	5 <sup>N</sup>	OCTOBER
APRIL	7	8	9	10 <sup>N</sup>	11*	12	13		6	7	8*	9*	10	11	12	
	14	15	16 <sup>+</sup>	17 <sup>+</sup>	18 <sup>+</sup>	19 <sup>+</sup>	20		13	14	15	16	17	18 <sup>F</sup>	19	
	21	22	23	24	25 <sup>F</sup>	26	27		20	21	22	23	24	25	26	
	28	29	30	1	2	3	4		27	28	29	30	31	1	2	
MAY	5	6	7	8*	9*	10 <sup>N</sup>	11		3 <sup>N</sup>	4 <sup>+</sup>	5 <sup>+</sup>	6 <sup>+</sup>	7 <sup>+</sup>	8	9	NOVEMBER
	12	13	14	15	16	17	18		10	11	12	13	14	15	16	
	19	20	21	22	23	24	25 <sup>F</sup>		17 <sup>F</sup>	18	19	20	21	22	23	
	26	27	28	29	30	31	1		24	25	26	27	28	29	30	
	2	3	4	5	6	7	8 <sup>N</sup>		1	2	3 <sup>N*</sup>	4*	5	6	7	DECEMBER
JUNE	9	10	11*	12*	13	14	15		8	9	10	11	12	13	14	
	16	17	18	19	20	21	22		15	16	17 <sup>F</sup>	18	19	20	21	
	23 <sup>F</sup>	24	25	26	27	28	29		22	23	24	25	26	27	28	
	30								29	30	31	1 <sup>N</sup>	2	3	4	2014 JANUARY
	S	M	T	W	T	F	S		5	6	7	8	9	10	11	
									12	13	14	15	16 <sup>F</sup>	17	18	
									19	20	21	22	23	24	25	
									26	27	28	29*	30 <sup>N*</sup>	31		
									S	M	T	W	T	F	S	

15 Regular World Day (RWD)

16 Priority Regular World Day (PRWD)

13 Quarterly World Day (QWD)  
also a PRWD and RWD

2 Regular Geophysical Day (RGD)

11 12 World Geophysical Interval (WGI)

+ Incoherent Scatter Coordinated Observation Day  
(The period Jan 15-Feb 16 is a StratWarm Alert interval with a fallback interval of Feb 7-12.)

10 Days of Solar Eclipse: May 10 annular & Nov 3 hybrid

10 11 Airglow and Aurora Period

15\* Dark Moon Geophysical Day (DMGD)

N NEW MOON F FULL MOON

NOTES on other dates and programs of interest:

1. Days with significant meteor shower activity (based on UT in year 2013) — regular meteor showers: Dec 28-Jan 12; Apr 16-25; Apr 19-May 28; May 22-Jul 02; May 20-Jul 05; Jun 05-Jul 17; Jul 12-Aug 23; Jul 17-Aug 24; Sep 09-Oct 09; Oct 02-Nov 07; Nov 06-Nov 30; Dec 07-Dec 17; Dec 17-26. These can be studied for their own geophysical effects or may be “geophysical noise” to other experiments.  
([website to be announced](#))
2. GAW (Global Atmosphere Watch) -- early warning system for changes in greenhouse gases, ozone layer, and long range transport of pollutants.  
[http://www.wmo.int/pages/prog/arep/gaw/gaw\\_home\\_en.html](http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html)
3. CAWSES II (Climate and Weather of the Sun-Earth System) – SCOSTEP Program 2009-2013. Program theme groups: Task1 - What is the solar influence on climate?; Task2 - How will geospace respond to a changing climate?; Task3 - How does short-term solar variability affect the geospace environment?; Task 4 - What is the geospace response to variable inputs from the lower atmosphere?; Capacity building; Informatics and eScience.  
Contact: Prof. Marianna Shepherd - mshepher@yorku.ca.  
<http://www.cawses.org/CAWSES/Home.html>  
[http://www.yorku.ca/scostep/?page\\_id=947](http://www.yorku.ca/scostep/?page_id=947)
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.  
Contact: info@ilwsonline.org.  
<http://ilwsonline.org/>.
5. + Incoherent Scatter Coordinated Observations Days – 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): January 15-31 Alert for StratWarm; February 1-16 Alert StratWarm; April 16-19 Synoptic; July 8-12 E-region E field; November 4-7 Synoptic.  
<http://www.isr.sri.com/wd2013.html>

**StratWarm** = Sudden Stratospheric Warming (StratWarm): Dynamics, electrodynamics, temperature and electron density in the lower and upper thermosphere and ionosphere during a sudden stratospheric warming event (L. P. Goncharenko, lpg@haystack.mit.edu)

**E-region E field** = Latitude variation of the vertical electric field in the E region (Q. Zhou, zhouq@muohio.edu)

**Synoptic** = Synoptic experiments and intended to emphasize wide coverage of the F region, with some augmented coverage of the topside or E region to fill in areas of the data bases that have relatively little data (J. Sojka, janjsjka@usu.edu; M. McCready, mary.mccready@sri.com)

## 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 **ICSU World Data System (WDS)** 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.) 10 May 2013, annular solar eclipse**, magnitude 0.954, maximum duration 06m03s, in Australia (Western Australia, Northern Territory, northern Queensland), Papua New Guinea's eastern tip, Solomon Islands, Pacific Ocean, Kiribati (5m44s of annularity); partial phases visible throughout Australia, in the northern island of New Zealand and the western half of its South Island, in most of Indonesia, southern Philippines, Papua New Guinea, in Fiji, Tuvalu, American Samoa, Cook Islands, French Polynesia, U.S. (Hawaii; 44% in Honolulu)

**b.) 3 November 2012, total solar eclipse with annularity at its beginning**, magnitude 1.016, maximum duration 01m40s, eclipse visible in the Atlantic Ocean, with partial phases visible at sunrise throughout eastern North America (U.S. east of Ohio to Georgia; Canada from Quebec to the east); Bermuda, South America (southern Columbia, eastern Venezuela, Guyana, Suriname, northeastern Brazil), Europe (Spain, Portugal, Greece), all of Africa except Cape Town region; and at sunset in the middle-East (western Turkey, Syria, Iraq, Saudi Arabia, Israel, Yemen, Gulf States). (Totality: Atlantic Ocean through Gabon, Congo, Democratic Republic of the Congo, Uganda, Kenya); annularity: Ethiopia, ending at sunset in western Somalia)

Information from Jay M. Pasachoff, Williams College (Williamstown, MA), Chair, International Astronomical Union's WG on Eclipses (<http://www.eclipses.info>) based on work by Fred Espenak, NASA GSFC and provided as a Google Map by Xavier Jubier.

**Meteor Showers** Dates selected from the International Meteor Organization Shower Calendar 2013. Peak times provided by A. McBeath. Includes important visual showers and unusual showers observable mainly by radio and radar techniques. The dates are given in Note 1 on the previous page.

### Definitions:

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

For more detailed explanations of the definitions, please visit [ftp://ftp.ngdc.noaa.gov/STP/publications/igc\\_calendars/](ftp://ftp.ngdc.noaa.gov/STP/publications/igc_calendars/) or <http://www.ises-spaceweather.org/>.

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

**Airglow and Aurora** — 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 2 Jan 2013 at 0000 UT, 9 Jan at 0600 UT, 16 Jan at 1200 UT, 23 Jan 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**s or **Airglow and Aurora** periods.

**Special programs:** Mary McCready, Center for Geospace Studies, SRI International, 333 Ravenswood Avenue, Menlo Park, CA 94025, USA; tel:+1-650-859-5084; Fax:+1-650-322-2318; email: [mary.mccready@sri.com](mailto:mary.mccready@sri.com), chair of URSI ISWG Commission G. See <http://www.isr.sri.com/wd2013.html>

**Ionospheric Drifts** — During weeks with **RWDs**.

**Travelling Ionospheric Disturbances (TIDs)** — special periods, probably **PRWDs** 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** — **RGDs** around noon.

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

**All Programs** — Appropriate intensive observations during unusual meteor activity.

**Meteorology** — Especially on **RGDs**. On **WGI**s 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, 7 bis avenue de la Paix, P.O. Box 2300, CH-1211 Geneva 2, Switzerland. [http://www.wmo.int/pages/prog/arep/gaw/gaw\\_home\\_en.html](http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html).

**Solar Phenomena** — Solar eclipse days, **RWDs**, and during **PROTON/FLARE ALERTS**.

**CAWSES II (Climate and Weather of the Sun-Earth System)** — SCOSTEP Program 2009-2013. Aim is to significantly enhance our understanding of the space environment and its impacts on life and society. The main functions of CAWSES are to help coordinate international activities in observations, modeling, and applications crucial to achieving this understanding, to involve scientists in both developed and developing countries, and to provide educational opportunities for students of all levels. Contact is Prof. Marianna Shepherd ([mshpherd@yorku.ca](mailto:mshpherd@yorku.ca)), SCOSTEP Scientific Secretary. Task Groups: Task1: What is the solar influence on climate?; Task2: How will geospace respond to a changing climate?; Task3: How does short-term solar variability affect the geospace environment?; Task 4: What is the geospace response to variable inputs from the lower atmosphere?; Capacity building; Informatics and eScience. See <http://www.cawses.org/CAWSES/Home.html>, <http://www.yorku.ca/scostep/>, and [http://www.yorku.ca/scostep/?page\\_id=947](http://www.yorku.ca/scostep/?page_id=947).

**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 [info@ilwsonline.org](mailto:info@ilwsonline.org). See <http://ilwsonline.org/>.

**Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy** — **QWDs**, **RWDs**, **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), now a part of the new World Data System (WDS), 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 2013 has been drawn up by R. A. D. Fiori and 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.

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

**Copies of earlier years' calendars are available upon request to either ISES Director, Dr. Terry Onsager, NOAA Space Weather Prediction Center, 325 Broadway, Boulder, CO, 80305, USA, telephone +1-303-497-5713, FAX +1-303-497-3645, e-mail Terry.Onsager@noaa.gov, or contact ISES Secretary for World Days, Dr. Robyn Fiori, telephone +1-613-837-5137, FAX +1-613-824-9803, e-mail rfiori@NRC.gc.ca. Beginning with the 2008 Calendar, all calendars are available only in digital format.**

The website for the International Geophysical Calendar, including recent versions, can be found at <http://www.ises-spaceweather.org/>. Archived calendars from 1957 to present are available at [ftp://ftp.ngdc.noaa.gov/STP/publications/igc\\_calendars/](ftp://ftp.ngdc.noaa.gov/STP/publications/igc_calendars/).