

# IAU Working Group on Eclipses Annual Report for the Calendar Year

2022

## Inter-Division C-E WG Solar Eclipses — Functional

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[https://www.iau.org/science/scientific\\_bodies/working\\_groups/93/](https://www.iau.org/science/scientific_bodies/working_groups/93/)

Members: Jay Pasachoff (USA, former Chair, died), Jay Anderson (Canada), Fred Espenak (USA), Beatriz Garcia (Argentina), , Michael Gill (UK), Shadia Habbal (USA), Yoichiro Hanaoka (Japan) , Xavier Jubier (France), Iraida Kim (Russia), William Kramer(USA), Kurokawa Hiroki(Japan) , Andreas Mueller(Germany), Zhongquan Qu (China, Chair), Kevin Reardon(Italy), Patricio Rojo (Chile), Vojtech Rusin (Slovakia), Glenn Schneider (USA), Costantino Sigismondi (Italy), Jagdev Singh (India) , Michael Wheatland (Australia) , Michael Zeiler(USA);

Associates: B. Ralph Chou (Canada), Michael Kentrianakis(USA)

The Working Group on Solar Eclipses has as its task basically the coordination of solar eclipse observational efforts, particularly making liaisons with customs and other officials of countries through which the path of totality passes and providing educational information about the safe observation of eclipses for the wide areas of the Earth in which total or partial eclipses are visible. Otherwise, some of us will try our effort to conduct the amateurs to obtain the scientific class data. Two of our members, Espenak and Anderson, produce widely used Technical Publications with eclipse paths and detailed information, available as hard copies or online, linked through [www.eclipses.info](http://www.eclipses.info) or via <http://EclipseWise.com>, a successor to the "NASA Eclipse Site." Gill runs the Solar Eclipse Mailing List, now at [SEML@groups.io](mailto:SEML@groups.io); daily summaries are available: <https://groups.io/g/SEML>. High-quality mapping is now available from Michael Zeiler, [GreatAmericanEclipse.com](http://GreatAmericanEclipse.com) and [eclipse-maps.com](http://eclipse-maps.com). Anderson at <http://eclipsophile.com> has cloudiness statistics and other weather-related information. Chou, a professor of optometry, is the world's expert on eye safety at eclipses. Jubier produces zoomable, clickable maps customizable for each eclipse; the forthcoming few are linked at our website at <http://eclipses.info>. Kramer at <http://eclipse-chasers-com> kept a log of statistics of individual eclipse observers, which Andreas Mueller has taken over and has added an archive of historical eclipse papers. The site <http://eclipse.aas.org> has advance notice of the 2023 and 2024 eclipse visibility across the United States, now headed by Claire Raftery (U.S. National Solar Observatory), Angela Speck (U. Texas at San Antonio), and Rick Fienberg (American Astronomical Society). Our past former chair Pasachoff was a member of the reconstituted American Astronomical Society Task Group on Eclipses for the 2023 annular eclipse, with partial phases across all of North America, and the 2024 total solar eclipse, with totality from Mazatlán, Mexico across the US

from Texas to Maine and onto the Canadian Maritimes. Among our successes is the distribution of material for tens of thousands of eye-protection filters.

In the past year 2022, only two partial solar eclipses took place. They were respectively partial eclipses on 2022 April 30 with an eclipse magnitude of only 0.6389(according to NASA) and October 25 with an eclipse magnitude of 0.8611(according to NASA). One of our members Costantino Sigismondi organized special events as well at St. Maria degli Angeli meridian line I.C.R.A. Network - Eclissi solare parziale - 25 Ottobre 2022 (icranet.org) and online (for the lunar eclipse, occurred at noon time for Europe). Our member Vojtech Rusin conducted the amateurs to observe in Slovakia, and some beautiful photographs were taken; Dr. Singh, one of our group members, guided their activities at Indian Institute of Astrophysics, Bangalore. Arrangements were made for the public to come and view the event. Groups of astronomers and the news media publicized the event so that the public can take a view of the partial eclipse with safety measures in India. Terry Cuttle has contributed to the service. He worked with the Astronomical Society of Australia to produce an eclipse website to provide comprehensive public information on the 20 April 2023 Australian total solar eclipse, the four more total solar eclipses in Australia in the next 15 years and provide safe viewing advice. He also provided information, evidence and advice to authorities and organizations to assist them to provide the best safe viewing advice to the Australian public and correct misinformation.

According to a statistics, there are more than 40 refereed papers, using data obtained from past solar eclipses, published from January 2022 to March 2023. This demonstrates that the solar eclipses especially total ones are still chances for science, and will continue to be valued. Actually, more techniques are created and new methods are applied for the eclipse observations. More and more amateurs engage in eclipse observations, and some of them are interested in obtaining the scientific class data for further analyses. Among these publications, the papers with authors of the Working Group are listed as examples (according to an incomplete statistics) :

- 1) Qu, Z. Q.; Chang, L.; Dun, G. T.; Xu, Z.; Cheng, X. M.; Deng, L. H.; Zhang, X. Y.; Jin, Y. H., 2022, 'Complexity of the Upper Solar Atmosphere Revealed from Spectropolarimetry during a Solar Eclipse', *ApJ*, 940,150;
- 2) Voulgaris, Aristeidis G.; Mouratidis, C.; Tziotziou, K.; Seiradakis, J. H.; Pasachoff, J. M. , 2022, 'A Diligent Analysis of the Flash and Coronal Spectrum of the Total Solar Eclipse of 20 March 2015', *Sol. Phys.*, 297,49;
- 3) Pasachoff, Jay M.; Rušin, Vojtech, 2022, 'White-Light Coronal Imaging at the 21 August 2017 Total Solar Eclipse', *Sol. Phys.*,297, 28;
- 4) Liang, Yu; Qu, Zhongquan; Hao, Lei; Xu, Zhi; Zhong, Yue, 2023, 'Imaging-polarimetric properties of the white-light inner corona during the 2017 total solar eclipse', *MNRAS*,518,1776;

- 5) Costantino Sigismondi, 2022, 'Eclissi parziale di Sole del 25 ottobre 2022 e frequenze', GERBERTVS, vol. 18, 31.

As part of Network for Astronomy School Education (NASA), the Key Initiatives in Education, Outreach and Development Working Group:

[https://www.iau.org/science/scientific\\_bodies/working\\_groups/334/](https://www.iau.org/science/scientific_bodies/working_groups/334/)

For observations of the 2023 total solar eclipse from Learmonth, Western Australia:

[http://xjubier.free.fr/en/site\\_pages/solar\\_eclipses/HSE\\_2023\\_GoogleMapFull.html?Lat=-22.21921&Lng=114.10302&Zoom=16&LC=1](http://xjubier.free.fr/en/site_pages/solar_eclipses/HSE_2023_GoogleMapFull.html?Lat=-22.21921&Lng=114.10302&Zoom=16&LC=1)

Anderson's [eclipsophile.com](http://eclipsophile.com) shows that the cloudiness statistics are favorable for Australia but unfavorable for observations from East Timor. For a full map, see

[http://xjubier.free.fr/en/site\\_pages/solar\\_eclipses/xSE\\_GoogleMap3.php?Ecl=+20230420&Mag=1&Max=1&Map=ROADMAP](http://xjubier.free.fr/en/site_pages/solar_eclipses/xSE_GoogleMap3.php?Ecl=+20230420&Mag=1&Max=1&Map=ROADMAP)

For the 2023 annular solar eclipse that crosses northeastern South America and then North America, including Mexico and the United States, on 14 October 2023

[http://xjubier.free.fr/en/site\\_pages/solar\\_eclipses/xSE\\_GoogleMap3.php?Ecl=+20231014&Acc=2&Umb=1&Lmt=1&Mag=1&Max=1&Map=ROADMAP](http://xjubier.free.fr/en/site_pages/solar_eclipses/xSE_GoogleMap3.php?Ecl=+20231014&Acc=2&Umb=1&Lmt=1&Mag=1&Max=1&Map=ROADMAP)

For the 2024 total solar eclipse, see

[http://xjubier.free.fr/en/site\\_pages/solar\\_eclipses/xSE\\_GoogleMap3.php?Ecl=+20240408&Mag=1&Max=1&Map=ROADMAP](http://xjubier.free.fr/en/site_pages/solar_eclipses/xSE_GoogleMap3.php?Ecl=+20240408&Mag=1&Max=1&Map=ROADMAP)

For maps of eclipses in 2025-2026-2027 visible from Spain, see

[www.eclipse262728.com](http://www.eclipse262728.com)

Each year, we provide "Eclipses" for the International Geophysical Calendar (International Space Environmental Service),

<http://www.spaceweather.org/ISES/info/geocal/geocal.html>