

IAU Commission E2 (Solar Activity)

2022 Annual Report

Commission Officers

- President: Manolis K. Georgoulis, Greece
- Vice President: R. T. James McAteer, USA
- Advisor: Paul S. Cally, Australia

Organizing Committee

- Ayumi Asai, Japan
- D. Shaun Bloomfield, UK
- Rebecca Centeno, USA
- Shravan M. Hanasoge, India
- Hui Li, China
- Hannah J. Schunker, Australia

Main Actions

- A1: Contribution to Division E toward identifying potential invited speakers for the 2022 IAU General Assembly in Busan, S. Korea.
- A2: Full-OC contribution to the evaluation of candidacies for the Division's 2021 PhD Prize.
- A3: Participation in the selection of non-General Assembly IAU Symposia for 2023.
- A4: Participation in the discussion and debate for the formation of an Inter-Division Working Group.
- A5: Participation in the organization of the Division Meeting Workshop: Heliophysics in the 21st Century, during the 2022 XXXI IAU General Assembly.
- A6: Discussion and comments on the representation of several facilities with solar physics interest in the social media ecosystem.
- A7: Support of two (2) letters of intent for Symposia during the 2024 XXXII IAU General Assembly in South Africa.
- A8: Participation in the discussion for the relocation of IAUS 365 from Russia
- A9: Support of a motion to increase the time allotted for solar physics observations at the ALMA radio telescope.

Brief information on some of the Main Actions

- A2: All E2 OC members are invited to rank the candidates and provide rationales for their ranking. The overall ranking is provided by the average on equal weights of all participating.
- A4: The Working Group aims to support the Office for Young Astronomers to gain access to astronomy related textbooks in different languages. Several suggestions on books

and repositories were offered. This spurred a vibrant discussion on open-access textbooks and available platforms, with several identified. Among the most prominent suggestions was that of a regularly updated online resource webpage. Whether this materialized is unclear.

- A5: The Workshop was organized on two days, August 5 and 8, 2022 and was very successful, with a long list of renowned speakers and important talks. The agenda can be found here: https://www.iauga2022.org/program/program_05_5.asp?sMenu=abo5
- A6: Facebook and Twitter, in particular, were discussed. Numerous teams, Journals and facilities have accounts on both venues.
- A7: One of them is entitled ‘4π view of the Sun; advances in solar observations and in space weather understanding’, while the other is entitled ‘Community Engagement and Open Science in the Virtual Observatory’. Both were strongly supported and are expected to be implemented during the 2024 XXXII IAU General Assembly.
- A8: IAUS 365 on ‘Dynamics of Solar and Stellar Convection Zones and Atmospheres’ was originally approved to take place in Moscow, Russia, in 2022. The war between Russia and Ukraine scrapped these plans and there was pondering over the venue and time of this event. The current, final date and place is August 21 – 25, 2023 in Yerevan, Armenia (<http://iaus365.sinp.msu.ru/>). This is planned to be an in-person event.
- A9: There is a motion by the community effectively protesting the apparent imbalance between solar and astronomical observational time commitments. This came to the attention of the Division and the Commissions under it and we strongly supported the petition of solar radio astronomers for a more balanced treatment.

Outlook for 2023

- We look forward to contributing to all the tasks of the overarching Division E and the Union as a whole, aiming to be constructive and offering educated opinions and feedback.
- We are processing lessons learned by the successful 2022 XXXI IAU General Assembly in Busan, S. Korea. The Assembly was primarily in person with a limited remote participation, along the lines of other recent Assemblies of similar size. Whether this imbalanced (mainly in-person) hybrid model will continue and proliferate is yet to be clearly seen, although in 2022 a largely expected shift toward traveling again for in-person participations has been witnessed.
- Major disruptions in international scientific collaboration because of the recent tragic events in Eastern Europe, as well as due to continuing post-pandemic adverse economic conditions in several parts of the world. We pledge to continue working to safeguard the quality of research and experimentation, keeping it as immune as feasible from geopolitical impediments, at the same time contributing to the Division’s and the Union’s efforts to respond to the new challenges. Encouragement and Union support of meeting organization and collaboration with communities located at less privileged parts of the world must continue and be enhanced.

Observing Facilities

Overall, a plethora of facilities and spacecraft, as shown below:

- **Ground-based:**

Numerous facilities of various sizes, either in operation or in planning. Excellent Wikipedia page aiming to list them here: https://en.wikipedia.org/wiki/List_of_solar_telescopes but missing some, such as multi-purpose LOFAR and ALMA. Planned facilities are currently implemented in China, Europe, India and the USA. A flagship such facility is the European Solar Telescope (EST) in Canary Islands, following the successful DKIST implementation in Hawaii. A small but ambitious, very recent solar telescope hosting a site of the Solar Activity Monitor (SAM) Network has been the Gyula Solar Observatory (GSO) in Hungary, under the auspices of the Hungarian Solar Physics Foundation (HSPF).

- **Space-based:**

On top of the existing, flagship SOHO/LASCO, SDO and STEREO, Solar Orbiter (ESA) and Parker Solar Probe (NASA) are extremely prolific, providing pristine data to the community. Workshops and large groups are analyzing the data, producing important results that clearly warrant further investigation and scrutiny. Other important missions, such as ASO-S (China) are about to release their data to the community. Missions in planning are SOLAR-C (Japan), Aditya-L1 (India), PUNCH, MUSE (USA), and PROBA-3 (Europe). A notable trend is the implementation or proposal of missions devoted to space weather monitoring and forecasting, such as ASO-S, Vigil (Former Carrington; ESA) and the FIREFLY Constellation mission concept (NASA) that, along with the Solar Polar Orbit Observatory (SPO; China), aim toward the important goal of stereoscopic, 4π solar observations. Parts of the community are further engaged in supporting the space weather forecasting needs of the NASA ARTEMIS Program and its imminent ARTEMIS 2 Phase.