

Report on the work of Commission C1 WG
Astronomy Competitions for Secondary School Students
during 2019

Introduction

The IAU EC approved the creation of the *WG Astronomy Competitions for Secondary School Students* in May 2019. Over the period June-July 2019 the proposed WG members were again contacted and the final membership list¹ was confirmed. A first meeting was scheduled to take place during the 13th International Olympiad on Astronomy & Astrophysics (IOAA) in Heviz, Hungary from 2-10 August, however time constraints during the event ultimately prevented this, and the meeting was postponed until after the IOAA (see summary of meetings below).

OAE and NAECs in relation to the WG

In parallel with the establishment and early work of the WG, the IAU evaluated proposals for the Office for Astronomy Education (OAE), announcing the selection of the Haus der Astronomie on 28 November 2019 and subsequently put out a call for National Astronomy Education Coordinators (NAECs) to interface between OAE and educators in individual countries.

At the time of writing this report the selection of NAECs is ongoing, with some countries still in this process or waiting for the results of proposals to establish local OAE sub-centres (e.g. India). Since there is a natural overlap between astronomy educators and astronomical competition organisers, it is expected that the NAECs will become significant contacts also for the WG; indeed some members of the WG have already reported that they will be among the NAECs for their countries (e.g. Poland, India). Once the selection process is complete the WG plans to reach out to these persons in continuation of its mission.

WG Meetings and Survey

The first general meeting of the WG was held via Google hangouts on 27 August 2019. As a result of the meeting, two committees were established, the first to formulate a survey to gather detailed information about astronomy competitions and other “nurture programs” in the target age groups (the WG decided that at this stage a slightly wider view was necessary, including the educational environment in which competitions are or could be held). The second committee was to begin collecting international contacts to persons

1 https://iau.org/science/scientific_bodies/working_groups/318/members/

involved in astronomy competitions, particularly those outside the existing IAU and IOAA communities. A second meeting was scheduled for 24 September 2019.

This second meeting on 24 September was held via Zoom. Draft versions of the survey questions and contact letters to astronomy competition organisers were presented and discussed and corrections suggested. A final version of the survey was prepared for general release by the end of September 2019. As well as questions on topics covered, participation numbers, stages and benefits (prizes, scholarships) it also includes questions about budget, organisation, and obstacles/difficulties faced by the organisers. The survey is available at: <https://getfoureyes.com/s/0a4qF/>.

Unfortunately, so far only four countries provided sufficiently detailed responses (S. Korea, Greece, UK, China). (We are aware that there were some initial technical difficulties with the survey platform which may have put off some respondents.) Nonetheless initial results show that some common features include: a range of levels targeted at age groups from 13 upwards; at least one online component (usually the first stage), national scope, both problem-solving and practical (observational components) and endorsement and support by national-level societies. Difficulties primarily involved publicity and reaching potential participants.

It was originally planned that this version of the survey would be revised in the light of the comments received and sent out again at the beginning of 2020 to the wider group of contacts established in the meantime, leading to a more detailed report. It was planned to do this in the first months of 2020, however the sudden realignment of local priorities in view of the COVID-19 pandemic has meant a delay in the work of WG members; a new version of the survey should be ready in May, when we can also use the newly appointed NAECs to achieve better coverage. It is also likely that some of the responses (e.g. relating to online vs physical participation) will be affected by the pandemic.

National and regional competitions and information

In addition to the survey, WG members have been active both in gathering information about local competitions and interested persons and in organising events. Some examples (WG member sources in parentheses) include:

- The 13th IOAA was successfully held in Hungary in August with many WG members in attendance. 45 countries sent one or more teams. Several countries participated for the first time, in particular Turkey and Moldova deserve special mention as the teams were grass-roots efforts organised by students rather than national societies. Subsequently it was reported at the KOLOS 2019 conference in Slovakia that the competition had a significant impact on all branches of the astronomical and teaching communities in Hungary. Professional and amateur

astronomers who were brought together to manage and organise the olympiad expressed satisfaction and were interested in future cooperation beyond the competition. Many teachers and pupils also 'noticed' astronomy due to the publicity surrounding the event and there was a twofold increase in the number of entries for the next round of the national olympiad. The 80+ 15cm EQ Newtonian telescopes acquired for the olympiad will be distributed to schools and societies and used for teaching purposes. [T. Hegedus]

- In the UK, an online 'fun' competition was created (2x30 questions) aimed at year 10 (age 14). Approximately two thousand entries were received and due to the popularity a second competition will be held in the autumn to also include year 11 (age 15). Outreach via the Federation of Amateur Astronomical Societies is also aimed at identifying young persons interested in astronomy who may not be supported through their school and involving them through these competitions. [C. Barclay]
- In Poland a panel of five NAECs was convened including one representative of the olympiad and one person involved in non-olympiad competitions [G. Stachowski]
- In Indonesia the national science olympiad has been moved under the aegis of the new Center of National Achievement (Pusat Prestasi Nasional). A 4-day workshop for teachers who are coaching students for national science olympiad participation in astronomy and earth sciences has been organised (also in conjunction with IAU NASE). [H. Malasan]
- In Slovenia approximately 40% of schools are involved in the National Astronomy Olympiad (elementary and secondary levels) and in the St. Petersburg Astronomy Olympiad (also both elementary and secondary levels). Training courses and camps for teachers and astronomy students are organised annually by the Society of Mathematicians, Physicists and Astronomers (DMFA Slovenije). A presentation on astronomy competitions and olympiads and their relevance in motivating and teaching students was given at the annual DMFA meeting in September. [A. Gustin]
- Armenia was successful in holding all stages of their National Astronomy Olympiad. [M. Gyulzadyan]
- In Greece the first two rounds of the annual competition on astronomy were completed. Presentations on astronomy competitions were made at the 11th Panhellenic Conference of Amateur Astronomy. [L. Zachilas]
- In S. Korea in 2019 the Korean astronomy olympiad (KAO) made available on-line resources (lectures, books) to school teachers (previously these were available only to KAO participants) in order to promote astronomy in secondary schools. Lectures and discussions were held at a summer teacher training camp and for teachers accompanying students to the national observational astronomy tournament

(November), again aiming to improve communication with and provide resources for teachers. Students also attended an annual winter training camp including remote observation with a 1m telescope. [Y. Kim]

- In Thailand the secondary school competitions are administered by the Promotion of Academic Olympiad and Development of Science Education Foundation (POSN) supported by 10 schools and universities as regional nodes. 35 students from each regional node advance to the 1st Astronomy Training Camp, from which 20 from each node are selected for an advanced training camp and finally 5 from each node go on to the National Astronomy Olympiad in May and June. [B. Soonthornthum]
- Institutions in other SE Asian countries involved in astronomy competitions for secondary school students include: the Institute Teknologi of Bandung and LAPAN (Indonesia), ANGASA (Malaysia Space Agency), PAGASA (Philippines), and the National University of Singapore. [B. Soonthornthum]

Conclusion

The WG has begun the process of collecting and collating data on existing astronomy competitions and related programmes and their impact on students and teachers. An initial survey was prepared and received some interesting responses, a revised version will be sent out in May 2020 to achieve better coverage. In the meantime information has been gathered by traditional means which shows continued interest in astronomy competitions from teachers and students and increasing participation numbers. There has been an increase in the availability of online resources aimed at teachers and students which derives from the competitions but which has wider application in teaching astronomy.

– collated by G. Stachowski from contributions by WG members.