

Report from the 2023 Review of the IAU Office for Astronomy Outreach: April 2020 – March 2023

Panel Members:

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1 Executive summary

This review is an external evaluation of the performance of the International Astronomical Union (IAU) Office for Astronomy Outreach (OAO) in light of the objectives described in the Agreement between the IAU and the National Astronomical Observatory of Japan (NAOJ) signed on 7 April 2021. The terms of Reference (ToR) for this review specify the issues that are addressed by this Review Panel. The focus of the review is on the OAO performance in the period from April 2020 to the end of March 2023. The review looks in addition at how well the OAO team is prepared for further development of program activities as foreseen in the IAU Strategic Plan 2020-2030.

The Review Panel received comprehensive documentation with information on OAO's relation to the IAU and its host the NAOJ, as well as the OAO's overall policy and program activity. Video interviews and Email communication with a range of OAO Stakeholders provided insightful and most important information for this review. Personal meetings with the OAO staff and the NAOJ Supervising Director provided additional, most helpful information on how the small, very motivated team dealt with its challenging outreach program.

The review discussed the current organisation and operation of the OAO, its program activities and mutually important interactions with various Stakeholders. The Review Panel concludes that the OAO team has been very well-qualified for the operation of its outreach program and has coordinated well with its Stakeholders. The key recommendations from the previous (2020) OAO review have been implemented, and the OAO, in principle, is well-positioned to develop its activity program further in accordance with the IAU Strategic Plan 2020-2030. However, we note that at the time of the visit of this Review committee to NAOJ, three members (Director and International Outreach Officer of OAO, as well as OAO NAOJ Public Outreach staff) have departed OAO and therefore the activities are considerably affected.

2 Background to the review

The purpose of this independent review is to assess the performance of the OAO against the objectives established in the IAU-NAOJ Agreement of 1st April 2020 and the IAU Strategic Plan 2020-2030 Goal 4. The issues to be addressed in this review are specified in the Terms of Reference (ToR) copied below. In addition, improvements and changes that were recommended in the 2020 Review of the OAO are evaluated.

The IAU-NAOJ Agreement was updated in 2021 on the background of the OAO's gradually expanding program and related workload. OAO is integrated in a well-functioning Public Relations Center (PRC) at NAOJ that enables the small team to focus on the objectives described in the Agreements. The third period of the Agreement has involved notable involvement in events such as the IAU100 celebration, taking over responsibilities of the Communicating Astronomy with the Public (CAP) Journal, CAP Conferences and Outreach Visitor Program. Steadily expanding activities involve interaction with the other IAU Offices and through the National Outreach Coordinator (NOC) network.

The various IAU Offices have overlapping interests related to outreach and education. A meaningful, successful cooperation implies avoiding double work and transferring tasks to the best qualified groups.

At the time of the review, the COVID-19 pandemic was seriously affecting the current and near-future planning and operation of central programs of the OAO and its collaborating organisations. The current situation is noted in §4 of our report, and the pandemic and its aftermath will inevitably imply further readjustments that are beyond the scope of this review.

3 Terms of reference

The focus of the review will be retrospective, covering the period from the beginning of April 2020 to the end of March 2023. The review will also cover the proposed future development of the OAO, in accordance with the IAU Strategic Plan 2020-2030.

The purpose of the review will be to assess the performance of the OAO against its objectives established in the Agreement:

- • assess the management of the OAO in terms of leadership, staffing, location and funding;
- • examine whether comments and recommendations in the previous review report were properly reflected and implemented in the subsequent term in question;
- • assess the maintenance and coordination of the IAU network of National Outreach Coordinators (NOCs), in the promotion of public awareness of the IAU activities, and coordination and management of the IAU international outreach campaigns;
- • assess OAO performance as the central information hub for disseminating IAU related public outreach activities around the world, as a facilitator for best practices, providing guidance and delivering regular information about ongoing activities in astronomy communication (e.g. CAP journal, CAP conferences, newsletter);
- • assess OAO practices in building a dialogue with the public through email and social media, to foster communication between the IAU and the public (e.g. channels used, and content promoted);
- • assess the interface between OAO and the IAU Scientific Bodies (e.g. Commission C2) and the other IAU offices;
- • assess OAO support and benefits to the NAOJ and NAOJ international activities;
- • examine the IAU/NAOJ Agreement with a view to its possible enhancement should it be renewed, taking into account the new IAU Strategic Plan 2020-2030, and make recommendations/suggestions to optimise the future development of the OAO.

4 Key findings

4.1 Current organisation and operation of the OAO

The Office for Astronomy Outreach (OAO) is located at the National Astronomical Observatory of Japan (NAOJ) in Mitaka, Tokyo, Japan. IAU and NAOJ share the responsibility and cost of operation of the OAO. As OAO host, the NAOJ provides relevant facilities, services and staff salaries. IAU is responsible for funding and coordination of OAO program activities with other IAU Offices, Divisions, Commissions and Working Groups.

OAO Team members (as of March 2023)

- Hidehiko Agata: Supervising Director (0.5 FTE, until March 2024) - NAOJ staff
- Lina Canas: Director** (1 FTE, until July 2023) - OAO staff
- Kelly Blumenthal: Deputy Director* (1 FTE, since March 2022) - OAO staff
- Suzana F. Martins: International Outreach Officer (1 FTE, November 2021 – August 2023) - OAO staff
- Miho Matsumoto: OAO NAOJ Public Outreach Staff (0.6 FTE, April 2022 – June 2023) - NAOJ staff
- Makiko Aoki: OAO NAOJ Collaborator (0.2 FTE) - NAOJ staff

During the period considered, this small staff appeared well integrated in an administrative and technically supporting PRC of NAOJ, under the leadership of Lina Canas, Director, and Hidehiko Agata, NAOJ Supervising Director, who work closely with other OAO team members.

The supporting facilities provided by the NAOJ enable the OAO staff to focus on their interactions with other IAU Offices, astronomy-related groups and individuals that are involved in outreach activities.

4.1.1 Governance

The Agreement between the International Astronomical Union (IAU) and the National Astronomical Observatory of Japan (NAOJ) plays a pivotal role in guiding the operations of the Office for Astronomy Outreach (OAO). This collaborative effort between IAU's Executive Committee (EC) and OAO was facilitated through the OAO Advisory Committee with the IAU Assistant General Secretary (AGS), OAO Supervising Director, and Commission C2 President until March 2021

In April 2021, OAO underwent significant changes in its oversight and reporting structure to align more closely with its sister offices within the IAU framework under the Agreement between IAU and NAOJ. To oversee OAO's activities and ensure alignment with its mission, a Steering Committee (SC) was established, comprising key members:

- Kazuhiro Sekiguchi (Chair, NAOJ)
- Diana Worrall (IAU, ex-officio Assistant General Secretary)
- John Hearnshaw (IAU)

* Upon the Agreement between IAU and NAOJ in April 2021, the International Outreach Coordinator (IOC) and Assistant Outreach Coordinator (AOC) job titles were changed to Director and Deputy Director, respectively.

- Masaaki Hiramatsu (NAOJ)

Since late 2021, OAO has held approximately three annual meetings with the Steering Committee. This engagement allows for continuous monitoring and collaboration. OAO follows a structured reporting process, where it submits an Annual Plan (refer to FY 2022-23 and FY 2023-24) and an Annual Report (refer to FY 2021-22, FY 2022-23) at the commencement and conclusion of each NAOJ fiscal year, covering the period from April to March, as outlined in the 2021 IAU-NAOJ Agreement. Through the independent interviews for Sekiguchi and Hiramatsu, Worrall, and Hearnshaw, the Review panel confirmed that all the SC members have coherent evaluations and recommendations and the SC works well for the OAO operation.

Furthermore, OAO maintains regular communication with stakeholders by providing news and updates. The Director communicates with stakeholders approximately once every three to four months, ensuring that all pertinent information is disseminated efficiently.

These developments demonstrate OAO's commitment to transparency, effective oversight, and collaborative engagement with the IAU and NAOJ to advance the field of astronomy outreach.

4.1.2 Day-to-day operation

Being a small team, the Director (former IOC), Deputy Director (former AOC), and International Outreach Officer (IOO) of OAO have to concentrate on their responsibilities for interaction and communication with stakeholders, which are done via e-mail correspondence, Basecamp, and Zoom calls. Administrative and technical duties are handled by the host institute NAOJ. The various urgent tasks must be prioritised and shared between the OAO team members and the interacting IAU Offices, groups and individuals. For example, they focus on preparing and implementing the virtual CAP Conference 2021, the hybrid CAP Conference 2022, and the NameExoWorlds 2022 contest. In parallel with these special events, they also continuously spend efforts to strengthen the NOCs network and publish CAP journals.

4.1.3 Well-being of staff

The Review panel observed a highly motivated and enthusiastic workforce within OAO. The dedication of the staff was evident in their active involvement in outreach-related activities, showcasing their optimism, eagerness, and conscientious work for IAU. The stakeholders the panel interviewed consistently praised OAO's activities, particularly highlighting the efficiency of initiatives such as the NOCs networking. Additionally, the CAP conference was noted as indispensable for networking among science communicators in the astronomy field.

Our interactions revealed a sense of integration within the broader IAU outreach community, where OAO staff were widely respected and appreciated by the EC. We found a positive atmosphere of cooperation, particularly among some NAOJ clerical staff, enhancing the overall collaborative environment.

However, challenges were noted concerning the alignment of working hours and patterns based on NAOJ's regulations with the demands of international business. This mismatch posed obstacles to efficient work styles, hindering the potential for streamlined operations.

Additionally, language and cultural barriers sometimes caused miscommunication. This challenge emerged as a necessary area for improvement.

In summary, the OAO staff's passion and dedication are commendable, fostering a vibrant atmosphere within the organisation. Addressing the discrepancies in work patterns and enhancing communication strategies, particularly considering language differences, could further optimise the working environment, ensuring the well-being of the OAO team and enhancing their contributions to the IAU's outreach endeavours.

4.1.4 Implementation of recommendations from the 2020 OAO review

According to the IAU Office for Astronomy Outreach Self-Evaluation Report in FYs 2020-2023, Page 7 which was written on July 1, 2023:

- **Recommendation 1.** We recommend that the currently vacant position of an IOO in the small OAO team be filled as soon as possible.
 - **Self-Assessment by OAO:** This has been implemented.
 - Review panel agreed with the OAO assessment.
- **Recommendation 2.** The IAU should form a small OAO Scientific Advisory Committee (SAC) of 4-5 professional astronomers to strengthen links with the astronomy research community. As suggested by the IAU President in her feedback to the panel, such a committee could “brain storm” with the OAO team a few times per year to discuss ideas for (global) projects as well as helping to provide additional astronomy content for the OAO.
 - **Self-Assessment by OAO:** With the establishment of the OAO Steering Committee (SC), this has been deemed unnecessary by the new OAO SC
 - Review panel agreed with the OAO assessment.
- **Recommendation 3.** The current OAO advisory committee (of IAU AGS, OAO Supervising Director and Commission C2 President) provides valuable guidance to the OAO. This group may be further strengthened by modification to a structure similar to the Steering Committees of other IAU Offices.
 - **Self-Assessment by OAO:** This has been implemented.
 - Review panel agreed with the OAO assessment.
- **Recommendation 4.** We endorse the recommendation of the IAU Strategic Plan 2020-2030 for an increase and restructure to ensure the effectiveness of the NOC network, and note that a well-functioning NOC network implies a balance between astronomers who are active in research and members of the astronomy outreach community.
 - **Self-Assessment by OAO:** We have been implementing this since 2020 with an emphasis on expanding the representation, with not one NOC but a NOC group that includes diverse members of the astronomy community. This is being monitored by establishing the profile of our NOCs.
 - Review panel agreed with the OAO assessment. See the Review panel recommendation section.
- **Recommendation 5.** We encourage the NOC network to interact with OAE’s Multilingual Astronomy Glossary through its new NAECs network.
 - **Self-Assessment by OAO:** We estimate that this is being carried by at least 30% of our NOCs network. This recommendation has been implemented in two ways: led by the efforts of the OAO Supervising Director and organically, as many NOCs are also NAECs, and this is a natural extension of their competencies as NAECs.

- **Note from Review panel:** We, the Review panel, endorse that the Astronomy Glossary activities be led by OAE and NAECs. The Glossary activities have already been led by the OAE.
- **Recommendation 6.** We endorse the recommendation of the 2016 OAO Review for a longer (4-5 year) renewal period for the IAU-NAOJ Agreement on OAO.
 - **Self-Assessment by OAO:** Not implemented.
 - **Note from Review panel:** The next IAU-NAOJ Agreement starting from FY2024 should be created for six years.

4.2 OAO program of activities

The OAO's program of activities is guided by the current IAU Strategic Plan, and the OAO uses this plan to set its priorities.

4.2.1 National Outreach Coordinators (NOCs) network

"IAU National Outreach Coordinators (NOCs)" is a network of persons serving as national-level representatives for the OAO. They act as a point of contact for astronomy outreach in their respective countries or territories and support the implementation of OAO projects at the national level. NOCs also help to disseminate astronomy news and events within their countries, thereby connecting local communities with the global network of the IAU. Through their participation in the NOC network, coordinators receive support from the OAO, including access to the NOCs Funding Scheme and outreach resources to help promote astronomy to a broader audience. The overall goal of the NOC programme is to strengthen astronomy outreach globally and promote equal opportunities to access astronomy. At the end of FY 2022-2023, the IAU NOCs network had a total of 136 members (Africa: 33; Americas: 24; Asia: 40; Europe: 37; Oceania: 2).

4.2.1 (a) Annual and special NOCs Global Projects

The following first four projects are implemented annually. In 2022, the third NameExoWorlds contest was held in addition to the annual projects.

Women and Girls in Astronomy

"Women and Girls in Astronomy" is a programme that promotes events that acknowledge the contributions of women in advancing science and encourages individuals of all gender identities to consider careers in astronomy. The IAU advocates for ongoing activities throughout the year, emphasising two United Nations-adopted International Days: the International Day of Women and Girls in Science on 11 February and International Women's Day on 8 March.

Telescopes for All

"Telescopes for All" is a programme in collaboration with partners Stars Shine for Everyone (SSVI) and the University of Leiden. The programme aims to promote equal access to astronomy and spark interest in science among children, parents and educators. The programme collaborates with partners, including national and regional astronomy societies, educational institutions, and local communities, to identify the areas where telescopes are most needed. In addition, the programme provides equipment and training to ensure communities have the knowledge and skills to use the telescopes effectively.

Dark and Quiet Skies Awareness

“Dark and Quiet Skies Awareness” is a programme to increase awareness about preserving dark and quiet skies. The programme aims to educate people about how dark skies are essential for human culture, heritage and health and their crucial role in conducting astronomy research.

100 Hours of Astronomy

“100 Hours of Astronomy” is a programme that aims to promote astronomy outreach events worldwide, encouraging individuals and organisations to host or participate in events during a 100-hour period. The programme aims to provide a platform for people of all ages to engage with the sky and develop a fundamental understanding of astronomy. Participants can choose from various creative activities, including organising a "Meet the IAU Astronomers!" meet-up or participating in an outreach event as part of NameExoWorlds 2022.

NameExoWorlds 2022

“NameExoWorlds 2022”, a programme organised by the IAU that allows people to suggest and vote for names for a selection of exoplanets and their host stars. The programme aims to raise awareness of the existence of exoplanets and the work done in exoplanetary research. The winning names will be officially recognized by the IAU and used in scientific publications. NameExoWorlds2022 is the project’s third edition, following the success of NameExoWorlds 2015 and 2019. The programme involves numerous outreach events worldwide, allowing the public to participate in astronomy.

4.2.1 (b) Other NOCs-related programs

‘Meet the IAU astronomers!’:

The programme provides amateur astronomers and educators a platform to connect with IAU member astronomers for virtual or in- person events. The programme aims to educate the public, including children, adults and undergraduate students, on astronomy research topics, the significance of astronomy for society, and career options in astronomy. It also offers undergraduate-level lectures to colleges and universities without astronomy programmes. The programme aims to enable anyone worldwide to meet professional astronomers and discover the Universe’s wonders.

NOCs Funding Scheme

The NOCs Funding Scheme is a dedicated grant system to support worthy outreach initiatives led by NOCs. Since 2020, OAO has called for applications annually and provides funding (a maximum of 5000 EUR per proposal) to projects presented as a joint activity between countries to bolster international cooperation. Since 2021, the SKA Observatory (SKAO) has funded projects dedicated to radio astronomy.

NOCs Activity Reports booklet

The first NOC Activity Report (2021-2023) booklet was created by OAO, including 60 NOCs and Co-NOCs from 55 countries and regions (Africa: 6; Americas: 12; Asia-Pacific: 17; Europe: 20), including about 50% of the NOCs.

4.2.1 (c) NOCs summary

The Review panel learnt that the number of NOC representatives has grown, and various OAO-driven global projects keep engaging NOCs. Active NOCs started interacting with each other through the NOCs funding scheme and other activities. The OAO's careful communication through online meetings and the Basecamp platform enabled the expansion of the NOCs network. The first booklet made NOCs' activities visible. Initiating and continuing the annual NOCs funding scheme to seed a new project is worthy of special mention. As the next step, direct communication and networking between NOCs and establishing NOCs regional offices are natural.

On the other hand, a certain number of inactive NOCs seem to exist. In addition, the evaluation process and NOC selection criteria are unclear. The OAO started re-coordinating the NOC members and their networks; a more sophisticated structure should be desirable.

4.2.2 Communicating Astronomy with the Public

“Communicating Astronomy with the Public” is a programme aimed to promote the professional development of astronomy communicators through various initiatives. The International Astronomical Union's Commission C2, Communicating Astronomy with the Public, is a significant partner of the CAP programmes, providing guidance and support to ensure effective and accurate astronomy communication to the public.

CAP Journal

The CAP Journal stands as a vital online, peer-reviewed publication, enabling astronomy communicators to share their work globally. Five issues were published over the review period (April 2020 - March 2023), showcasing diverse astronomical outreach efforts.

In 2022, significant changes were introduced to the editorial policy and submission process to elevate the journal's professionalism. However, these alterations brought challenges. The Steering Committee, a critical stakeholder, was not adequately informed about the policy shifts. Interviews with stakeholders indicated that these changes were not widely recognized, creating a disconnect in understanding among contributors and reviewers.

The impact of these policy modifications remains ambiguous. Notably, types of non-peer-reviewed submissions have been eliminated, yet the overall consequences of this shift remain unclear.

CAP Conference

The CAP Conference is a biennial event that brings together professionals and enthusiasts in astronomy communication to share best practices, knowledge and new developments in the field.

The CAP Conference faced unprecedented challenges due to the Covid-19 pandemic. The scheduled CAP Conference in 2020 had to be postponed to ensure participant safety during these uncertain times. In response to the pandemic, the CAP Conference swiftly adapted. In 2021, a Virtual CAP Conference was organised, attracting a remarkable attendance of over 800 participants. The decision to waive the registration fee likely contributed to this exceptional turnout. The CAP Conference 2022 marked a milestone as it embraced a hybrid format for the first time, accommodating both in-person and remote attendees. More than 200 participants actively engaged in discussions and networking

activities, fostering a vibrant atmosphere of knowledge exchange. Both the Virtual and Hybrid CAP Conferences were resounding successes. Participants expressed shared excitement about exchanging outreach experiences, unveiling new findings, and building connections. The diverse range of outreach activities showcased at the conferences sparked mutual inspiration among attendees.

While the CAP Conference 2022 opted for a unique approach, publishing a special issue in the CAP Journal instead of traditional proceedings, the output was limited. Only five articles were included in the special issue, a modest representation considering the breadth of presentations delivered.

CAP Training programme

The CAP Training programme started as a collaborative initiative between the IAU and the Kavli Foundation in 2022. The programme aims to elevate the standards of science communication and outreach within the IAU community and emphasises both strategy development and skill enhancement in the realm of public engagement.

Initiated in 2022, the CAP Training program conducted six events throughout the year. The CAP Training program is set to continue its efforts into 2023, focusing on the NOCs Funding Scheme 2024. The program, delivered through web meeting platforms and archived on YouTube, ensures accessibility and broader reach among the IAU community. Despite the program's promising start, challenges surfaced. Notably, the most viewed video addressing the JWST's First Image garnered approximately 350 views, indicating a relatively modest response. The panel, however, encountered difficulty in pinpointing the precise reasons behind this limited popularity. As the CAP Training program is in its nascent stage, assessing its reputation and understanding the specific needs of the target audience emerge as crucial steps.

4.2.3 Other activities

IAU Astronomy Outreach Newsletter

The IAU OAO Newsletter is a vibrant digital platform fostering community engagement and collaboration. Released monthly, it compiles diverse content, encompassing news from the IAU, updates from the broader astronomy communication community, and a plethora of opportunities and resources sourced directly from the community itself. Over the period spanning FY 2020-2023, the OAO consistently produced an average of two Newsletters each month. This regularity ensured a steady flow of information to the subscribers, contributing to a sense of community within the astronomy outreach field. Recognizing the global reach of astronomy enthusiasts, the Newsletter is published in English and subsequently translated into eight languages. This multilingual approach enhances accessibility, catering to a diverse, international readership.

Evaluation of engagement metrics revealed a notable open rate of 30 percent, surpassing the industry average for the "general segment" of users. However, it is pertinent to note that this open rate represents an average value among highly engaged users, indicating a strong resonance with the content among the most active readers.

Social Media, Public Enquiries, and Other Communication Channels

The OAO operates through different communication channels, using Social Media (Twitter & Facebook), public enquiries via email, Frequently Asked Questions (FAQs) and IAU Themes on iau.org to support the IAU relation with the public.

- **IAU and OAO Social Media:** the OAO maintains both IAU and OAO social media; The IAU social media channel (Facebook and Twitter) serves the IAU community of professional astronomers, informing them of upcoming events, activities, and the recent news from the Divisions, Commissions, and Working Groups of the IAU. The OAO social media accounts (Facebook and Twitter) serve to disseminate information about our activities and to promote the work of the NOCs, other IAU Offices, and relevant content from our partners. The OAO's followers on Facebook and Twitter have been steadily increasing, aggregating more than 2000 additional followers for both platforms over three years.
- **Frequently Asked Questions (FAQs) and Public Enquiries:** The OAO updates and maintains the IAU FAQs (<https://www.iau.org/public/faq/>) according to new information that becomes available and new questions that are repeatedly asked by the general public in our Public Enquiries.
- **IAU Themes:** The IAU Themes (<https://www.iau.org/public/themes/>) are articles on topics that are frequently asked by the public and require a longer response than the FAQs and Public Enquiries allow. At the end of FY 2022-23, it was agreed that the Themes would fall under the purview of the OAO, allowing for more freedom in the production and dissemination of these articles.
- **Catalyst:** The OAO supports the IAU General Secretary and IAU President with the editorial process and publication of this IAU publication.
- **IAU Press Office:** The OAO works with the IAU Secretariat to quickly highlight important news from the IAU Head Administration to the IAU community and the wider public. In addition, the OAO oversees the expenditures of the IAU Press Office and flags any potential issues.

The Astronomy Translation Network (ATN)

The ATN is a global networking framework that identifies high-quality astronomy resources that need translation from English into other languages and matches these with volunteer translators. This project was initiated and coordinated by a PRC/NAOJ staff member deeply involved in the OAO. There have been substantial delays in the management of the ATN due to the lack of Human Resources after the project manager left NAOJ.

4.3 Interactions with IAU and key stakeholders

- **Interaction with Office of Astronomy for Development (OAD)**
- **Interaction with Office of Astronomy for Education (OAE)**
- **Interactions with the IAU Executive Committee (EC)**
- **Interaction with IAU Centre for the Protection of the Dark and Quiet Sky from Satellite Constellation Interference (CPS)**
- **Interactions with IAU WGs**
 - Commission C2 WG
 - Exoplanetary System Nomenclature
 - Dark and Quiet Sky Protection
 - Professional-Amateur Relations in Astronomy

- Women in Astronomy
- Astronomy for Equity and Inclusion

As an IAU office, the OAO has close communications with other sister offices: the Office of Astronomy for Development (OAD) in South Africa and the Office of Astronomy for Education (OAE) in Germany. The three offices have similar structures; NOCs for OAO are the NAECs for OAE, and Regional offices (ROADs) and Language Expertise Centres (LOADs) for OAD. With interviews of OAD, OAE, some NOCs, and some NAECs, the Review panel learned that NOCs, NAECs, and ROADs/LOADs started collaboration in some regions and languages, which is a natural and desirable style between the three offices. On the other hand, the OAO is responsible for the Outreach of the IAU through the IAU social media, publishing Catalyst and IAU press releases, causing an asymmetry between the OAO and its sister offices.

The OAO also works with IAU WGs like the CPS and the Dark and Quiet Sky Protection WG for the Dark and Quiet Sky Awareness project, the Exoplanetary System Nomenclature WG for the NameExoWorlds contest, and the Women in Astronomy WG for the Women and Girls in Astronomy project. All WG representatives interviewed by the review panel expressed their appreciation and kudos for the work of the OAO. However, the panel was concerned some WG representatives expected more than OAO's roles in their projects.

4.4 Interactions with NAOJ

NAOJ provides facilities and services that are essential for the effective functioning of the small OAO team in accordance with the 2020 agreement between IAU and NAOJ. The OAO staff contracts are with NAOJ, while IAU shares with NAOJ the cost of the salaries (OAO Operations budget), besides financing the new NOC's projects and sponsoring the CAP Conference. Being integrated as one among eight PRC offices of the NAOJ notably reduces the administration workloads of the OAO. 20% of OAO's work involves PRC-related tasks such as the Asia-Pacific Regional IAU Meeting (APRIM) work and contribution to raising the NAOJ institutional profile internationally. However, finding significant and sustainable collaboration between the OAO and other PRC offices was challenging, and the Review panel identified the language and cultural barriers between them.

5 Conclusions

This Committee agrees with previous assessments that OAO is an essential asset to the IAU and the NAOJ for promotion of public awareness of astronomy. During the 2021-2023 interval OAO has carried out an outstanding performance in successfully promoting astronomy education and outreach worldwide. The overall program is complex and requires considerable coordination with NAOJ as well as with a wide set of other IAU offices. The full time team members of this small group (Lina Canas, Kelly Blumenthal and Suzana F. Martins) and the additional collaborators have worked well together, with well distributed tasks and effective leadership.

Our evaluations of the OAO performance are based on-line interviews, email communications, and a set of relevant documents (listed in Appendix A) previous to our visit to the office located in NAOJ in Tokyo, where a wider range of personal and on-line

interviews were carried out (the complete list of interviews are listed in Appendix B). Our conclusions in response to the Terms of Reference for this review are given in Section 6 of this report.

However, at the time of this report we recognize that OAO is faced with a crisis: two of the three core members of the team have left. Kelly Blumenthal remains in the office as acting director and although she is extremely capable and resourceful, it is clear that the OAO activity is severely crippled. This situation presents a serious challenge to the future activities of the organisation. We recommend that the vacant positions be filled soon; however, care must be exercised in hiring professionals with the proper profile.

6 Recommendations

Based on our assessment, we offer a series of recommendations aimed at enhancing OAO's performance and impact in the field of astronomy outreach. Some recommendations overlap with the Steering Committee's in the report "Steering Committee's report on the IAU Office for Astronomy Outreach (OAO) Steering Committee Meeting, 8 – 10 March 2023," which means the Review panel endorses SC's recommendations.

6.1 Project Prioritization:

1. **Prioritisation of Projects:** The most critical recommendation is to prioritise OAO's projects and regular activities such as the management of the website and social media. A clear prioritisation strategy will allow efficient allocation of resources and maximise outreach impact. It is recommended that the OAO adopt a clear and strategic approach to prioritise its tasks and projects. Prioritisation will enable OAO to allocate resources efficiently and focus on activities that align most closely with its mission and outreach goals.

6.2 Governance:

1. **Longer Period of the IAU-NAOJ Agreement:** The next agreement between IAU and NAOJ should cover a more extended period (six years), enabling more stable operation.
2. **Simple Line of Command:** The role of the Supervising Director will be discontinued at the time of the following Agreement, and the OAO should be supervised by the Steering Committee (SC).
3. **Individual Members' Activities:** OAO should include individual members' activities in its reports, such as talks, committee participation, and public presentations. This addition will provide a more comprehensive view of OAO's outreach efforts.
4. **Clearly Define the Roles and Responsibilities** of the Director of OAO, the SC, and individual OAO staff members to establish a well-defined framework for effective coordination and collaboration within the organisation.
5. **Appropriate Budget Management:** OAO should maintain diligent budget management practices to ensure resources are utilised efficiently. The OAO Director's position for the budget implementation should be clearly stated in agreement with SC and the PRC Director.

6. **Clear and Concise Financial Reporting:** Financial reporting should be clear and concise, allowing stakeholders to easily understand OAO's financial status. The financial report should be visible for appropriate IAU and NAOJ committees.

6.3 CAP Journal:

1. **Communication of Editorial Policy Changes:** OAO has successfully improved the CAP Journal's editorial policy and the review process. We recommend OAO to proactively communicate these changes to potential authors and readers. This will ensure transparency and promote wider engagement with the journal.
2. **Reputation Survey:** The panel recommends the CAP Journal's editorial office to conduct a reputation survey among readers and authors (including potential readers and authors) in addition to the target audience. This survey will assess if the revised editorial policy aligns with the needs of the stakeholders. In addition, the stakeholder feedback will clarify regarding how these changes might influence the journal's content and community engagement.
3. **Identification of Popular Articles:** The OAO should also identify popular articles and gauge their impact on practitioners of astronomical outreach.
4. **Explore ways to include NOCs in the publication:** the Review panel recommends that the OAO explore the possibility of including reports by NOCs in an on-line only supplemental CAP issue on a yearly basis.

6.4 NOCs (National Outreach Coordinators):

Many of the NOCs are doing well and are led by inspired coordinators who are working hard on outreach projects in various forms. In some cases there are attempts to bring together outreach efforts in small neighbouring countries which will clearly be very beneficial. To accelerate these processes the following recommendations are made:

1. **Clarify Selection and Evaluation Processes:** OAO should provide clearer guidelines regarding the selection and evaluation processes for NOCs. Transparency in these processes is essential to ensure effectiveness and continuity. The ability of the NOC to provide leadership is critical for the success of activities in the region.
2. **Consider the possibility of appointing multiple Outreach Contacts (OCs) within a single country or region.** The Review panel recognizes that in certain cases, countries or regions may be geographically extensive, making it challenging for a single NOC to effectively cover all areas. To ensure comprehensive and targeted outreach efforts, OAO should assess the size and diversity of countries or regions and determine whether appointing OCs within these larger areas is advantageous. This approach can facilitate tailored outreach initiatives that address the unique needs and characteristics of different regions within a single country. A NOC will be needed, but the reporting structure needs to be thought about.
3. **Explore the possibility of a modest and reasonable budget to support NOCs:** the Review panel recommends that the OAO explore the possibility of allocating a modest and reasonable budget to support the activities of NOCs. While NOCs play a vital role in advancing OAO's outreach objectives, they often operate with limited or no resources. However, we recognize that any expense requires a significant administrative effort, so it may not be feasible to allocate many small grants.

6.5 Other Activities

1. **NameExoWorlds Contest:** Working with the IAU Exoplanetary System Nomenclature WG, consider the possibility of the fourth contest in a couple of years.
2. **Astronomy Translation Network (ATN) Decision:** The OAO must make a carefully considered decision about the management of the ATN. A comprehensive evaluation of ATN's relevance and alignment with OAO's mission will guide this decision-making process. We propose that this task be transferred to the OAE, and the OAO supports it with its translators list and NOCs network, ensuring that the existing translation work is appropriately archived and accessible on a dedicated webpage. This recommendation aligns with Recommendation 5. "We encourage the NOC network to interact with OAE's Multilingual Astronomy Glossary through its new NAECs network" in the Report from the 2020 Review of the IAU Office for Astronomy Outreach: April 2017 - March 2020.
3. **Communication with Professional Astronomers:** The OAO should attempt to increase the visibility of IAU astronomers at various events, starting from NOCs Global Projects like Women in Astronomy, Dark and Quiet Skies, NameExoWorlds contest, etc.

6.6 Management of OAO website and social media:

1. **Website Update:** The panel recommends that OAO establishes an independent website, separate from the IAU, and prioritises its transformation into a modern, user-friendly platform. The existing website's outdated layout poses challenges to efficient information access and outreach resource utilisation. OAO staff members should take charge of maintaining and updating the website to ensure its effectiveness.
2. **Enhanced Social Media Engagement:** OAO should utilise social networking sites (SNSs) more effectively to disseminate information. This will help reach a broader audience and foster greater engagement.

6.7 Key Performance Indicators (KPIs):

1. **Establish KPIs:** The review panel recommends establishing Key Performance Indicators (KPIs) to measure the efficiency, impact, and reputation of select OAO activities. Recognizing that not all activities can be quantitatively evaluated, the panel suggests identifying specific activities where KPIs can provide valuable insights. By setting KPIs, OAO can visualise the reach and impact of these activities, gaining insights into participants' reputations and the efficiency of the resources invested. This measurement can compare these values against the financial costs and human resources allocated to the activities.

The panel emphasises that understanding the performance through KPIs will provide valuable clues for enhancing these activities. While acknowledging the qualitative nature of some OAO initiatives, the panel believes that KPIs can serve as appropriate and clear guides for certain activities. Utilising these indicators can facilitate a more informed evaluation of the activities' effectiveness and help identify areas for improvement. The ultimate goal is to enhance the impact and efficiency of OAO's outreach efforts by leveraging quantifiable metrics where applicable.

6.8 Evaluations and Reviews

1. **Streamline Evaluation Processes:** To alleviate the burden of multiple reviews and evaluations, it is strongly recommended that OAO streamlines its evaluation processes. Currently, multiple evaluation mechanisms, including PRC evaluation, SC review, and external evaluation contribute to complexity and workload. Transitioning to an annual evaluation approach can simplify the assessment process and reduce the number of evaluations, ensuring more efficient operation.
2. **Harmonise Recommendations:** OAO should aim to harmonise the recommendations received from various evaluation sources. Divergent sets of recommendations from external review committees and the SC can create operational challenges and hinder clarity in decision-making. By aligning these recommendations to a common framework, OAO can work more cohesively and effectively towards its goals. This will be helped by reducing the number of reviews.

6.9 OAO as an Office of NAOJ

1. **Collaboration with Other NAOJ Offices and Projects:** The OAO is one of the PRC offices; however, the OAO Director should have the authority to work directly with OIR and other projects such as Subaru Telescope, ALMA, and TMT if they have synergy for NAOJ work such as internationalisation and branding of NAOJ.
2. **Japanese Speaking Staff in the OAO:** With the agreement with the PRC Director, the OAO should include a Japanese-speaking staff member involved in astronomy outreach (at least 0.2 FTE).
3. **Employment of OAO personnel in the Discretionary Work System (裁量労働制):** Within his term (by the end of March 2024), the Supervision Director of OAO should discuss with the NAOJ Personnel Unit, with the support of the PRC Director and the Director General (if necessary) so that NAOJ can start hiring the three full-time personnel (Director, Deputy Director, and International Outreach Office of OAO) in the discretionary work system starting in April 2024. As OAO staff members frequently have meetings with NOCs and other IAU offices in the early morning and late at night of Japan, the fixed schedule regime requiring them to work from 8:30 a.m. to 5:15 p.m. does not meet their work style and may induce overwork. We consider the change of their work system is urgently needed.
4. **Explore the Possibility of Working with Other PRC Offices:** To promote collaboration and leverage the expertise of both entities, the OAO should actively engage with other PRC offices, such as the Outreach and Education Office, at least one outreach project. Initiatives such as "Astronomy in Women and Girls" or "Meet the IAU Astronomers!" projects could serve as potential collaboration opportunities. This collaboration will foster cross-functional teamwork and contribute to the mutual goals of promoting astronomy outreach.

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We also extend our thanks to Makiko Aoki for her exceptional support in coordinating logistics and facilitating various aspects of the review process. Her dedication and efficiency were instrumental in ensuring the smooth conduct of our assessment.

Appendices

A Documents received

1. IAU-OAO Agreement, 2021;
2. Self-Evaluation Report (SER) from the OAO (details below in Section 4.2.f);
3. IAU Strategic Plan 2020-2030
4. Summaries of the IAU National Outreach Coordinators (NOCs) in terms of their objectives with respect to the OAO mission, activities and the IAU strategic plan;
5. OAO External Review Report 2020;
6. OAO Annual Report FY2020
7. OAO Annual Report FY2021
8. OAO Annual Report FY2022
9. Terms of Reference (ToR)

B List of OAO team and Stakeholders that provided input for this review

OAO

- Hidehiko Agata OAO Supervising Director
- Makiko Aoki OAO NAOJ Collaborator
- Kelly Blumenthal Deputy Director & Acting Director of OAO (as of September 2023)
- Lina Canas Past Director of OAO
- Andre Girolamodibari Freelance Associate of OAO, University of Leiden
- Izumi Hansen Past Assistant Outreach Coordinator
- Fatoumata Kebe OAO Visitor
- Mizuho Matsumoto Past OAO NAOJ Collaborator of OAO

Steering Committee

- John Hearnshaw Past IAU Vice-President & OAO Steering Committee Member
- Hiramatsu Masaaki NAOJ PRC Head of the Spectrum Management Office & OAO Steering Committee Member
- Kazuhiro Sekiguchi Past Head of NAOJ OIR & Chair of OAO Steering Committee
- Diana Worrall IAU Assistant General Secretary & OAO Steering Committee Member

NAOJ

- Hiroko Komiyama Senior Specialist of NAOJ PRC
- Sayumi Noguchi Administrative Expert of NAOJ PRC
- Saku Tsuneta Director General of NAOJ
- Junichi Watanabe IAU Vice-President & Past Vice Director General of NAOJ
- Hitoshi Yamaoka Director of NAOJ PRC & NOC Japan

Other IAU Offices

- Piero Benvenuti Director of IAU CPS
- Lars Christensen IAU Director of Communications
- Rosaria D'Antonio IAU Head of Administration
- Kevin Govender Director of OAD
- Markus Pössel Director of OAE

Divisions, Commissions, WGs

- Richard de Grijs President of Division C Education, Outreach and Heritage
- Oana Sandu (Barbulete) President of Commission C2 Communicating Astronomy with the Public
- Sylvie D. Vauclair Vice-President of Commission C2 Communicating Astronomy with the Public
- Mamta Pommier Chair of Executive Committee WG Women in Astronomy
- Timothy S. Spuck Co-Chair of Executive Committee WG IAU EC WG for Professional-Amateur Relations in Astronomy
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NOCs

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- Samir Dhurde NOC India & IUCAA
- Wichan Insiri NOC Thailand and NARIT
- Monika Jurković NOC Serbia
- Carolin Liefke NOC Germany & OAE
- Margarita Metaxa NOC Greece
- Farseem Mohammedy NOC Bangladesh
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- Ugyen Pem NOC Bhutan
- Eduardo Monfardini Penteadó NOC Brazil & OAE
- Salma Sylla NOC Senegal

C Acronyms

- AGS: Assistant General Secretary
- ALMA: Atacama Large Millimetre/submillimetre Array
- AOC: Assistant Outreach Coordinator

- CAP: Communicating Astronomy with the Public
- CAPj: Communicating Astronomy with the Public journal
- EC: Executive Committee
- IAU: International Astronomical Union
- IOC: International Outreach Coordinator
- IOO: International Outreach Officer
- IUCAA: Inter-University Centre for Astronomy and Astrophysics, India
- JWST: James Webb Space Telescope
- LOADs: Language Expertise Centres of the OAD
- NAECs: National Astronomy Education Coordinators
- NAOJ: National Astronomical Observatory of Japan
- NARIT: National Astronomical Research Institute of Thailand
- NOC: National Outreach Coordinator
- OAD: Office of Astronomy for Development
- OAE: IAU Office of Astronomy for Education
- OAO: Office for Astronomy Outreach
- OIR: Office of International Relations
- ROADs: Regional Offices of the OAD
- PRC: Public Relations Center
- SC: Steering Committee
- SAC: Scientific Advisory Committee
- TMT: Thirty Meter Telescope
- ToR: Terms of Reference
- WG: Working Group