

Session 1: State of the Art in Astronomy Education

Introduction

Each day of the symposium included two themed sessions. Session 1 on the opening day was themed “State of the Art in Astronomy Education.”

These Proceedings begin with a talk by John Hernshaw discussing “The IAU Strategic Plan 2020–2030, a blueprint for forging a new social revolution in astronomy and for using astronomy as a tool for building a progressive society.” John began with some background information by relating some of the history and evolution of the IAU and he continued with a description of its structure. He then included some of the ways in which the IAU has transformed how it operates including its evolution for better diversity and inclusion. John next went into a discussion of the IAU’s Strategic Plan for 2020–2030 that first emerged at the 2018 IAU GA in Vienna. He brought out the five main goals for the new decade and gave insightful commentary for each of them. John continued with the need for fundraising to support these initiatives and included suggestions as to where the IAU can expand future activity. In his conclusion he stated “...we can expect the social revolution to continue, with the aims not only to foster the science of astronomy, but also to help build a more progressive society using astronomy as a tool.” In consideration of all that was outlined by John, the IAU can anticipate a great decade ahead.

Following the talk Claudio Pastrana asked:

It is not necessarily a question, but there was a time when it was evident that the IAU had become an institution with testosterone excess. There was a conscious effort for a change? Or, simply, Women, were gaining their spaces as they usually do? With courage and intelligence?

and John Replied:

I think initially the early IAU pioneers that promoted the social revolution made a conscious effort – people like Jean-Claude Pecker and Edith Muller. But the drive to promote women in astronomy has really come from women themselves in recent decades. The need to promote gender equality is now widely recognized as a goal for the IAU and indeed for all sciences.

The next article is by Mirjana Povic and is called “Development of astronomy research and education in Africa and Ethiopia.” In it Mirjana talks about the great potential in Africa and in particular in Ethiopia. She describes recent advances for astronomy research and education and also what needs to be done for the future. She cites the Square Kilometer Array (SKA) as an example of a contributor to Sustainable Development Goals. She gives other examples associated with such as the South African Astronomical Observatory (SAAO) and the Ethiopian Space Science Society (ESSS) that show the future to be bright for astronomy on the African continent.

A paper by Sally Cooper follows and is called “The National School’s Observatory: Access to the Universe for all.” Sally describes how the National School’s Observatory

(NSO) makes access to the robotic Liverpool Telescope available to all schools in the United Kingdom and Ireland. Students are afforded the same access as are professional astronomers. The paper goes on to describe the value of the program and the importance of accessible data driven astronomy in education. Access is free and activities are available for students from seven to 18 years old, as well as for adults. She discusses the potential of the New Robotic Telescope (NRT) on La Palma and stresses the importance of the next generation of robotic telescopes for data driven astronomy education.

After the talk Amelia Bayo asked:

Hi Sally, such a great project!!! In Chile (within NPF) we are producing astronomy mirrors / segments out of carbon fiber, therefore much lighter, would that be something of interest for the new telescope?

and Sally replied:

Hi Amelia, I don't know much about the technical side of the new telescope. You can find out more about the telescope in the link and feel free to contact the team – they are very welcoming of interest. <http://www.robotictelelescope.org/team/>

Then De Lara Rodrigues asked:

Dear Sally, connecting with Cintia's talk, I would like to know if NSO is interested in collaborating with non-English-speaking countries to translate at least some part of the website to other languages. It isn't easy to find high-quality and updated astronomy educational resources in other languages (and for the Southern hemisphere, as Cintia pointed out)

and Sally replied:

Please feel free to contact me at sally@schoolsobservatory.org The SchoolsObs is very open to working with countries to translate our resources. Please get in contact if you want to know more.

After Cooper's article you will find Sze-leung Cheung describing "A preliminary study of the impact of high school astronomy research-based learning in Thailand." In this he talks about student opportunities in Thailand with such as presenting in the student session of the Thai Astronomical Conference and mentored student research activities in the Advanced Teacher Training scheme. Preliminary results were said to support the valuable roles that planetariums can play in motivating students. It also was brought out that lecture settings are the norm in Thailand with few experimental activities, but that adding research in schools helps to develop thinking and produce new ideas. Results supported better personal development and self-confidence. He suggests that these findings might be useful in helping IAU Commission C1 to promote global research-based learning activities.

Following the talk Claudio Pastrana asked:

I can take PISA very seriously, because the monstrous inequality in OECD countries isn't parametrically corrected. Countries with many troubles are measured with the same rule. Let me say this in a nice form: This people are mistaken. How much are you, personally, concerned about PISA index? Isn't it a better course of action to take the problem and adjust the best possible solution, disregarding PISA?

and Sze – leung replied:

This is a good question, and I think it deserve a separate study. In my understanding, PISA are conducted differently in different countries, I have spoken to our NARIT director who also sits on the PISA board of Thailand, he told me that my countries play tricks in the scoring, so yes it is difficult to compare, but if you read carefully on the PISA report it actually gives many detailed information such as the distribution of the student performance within the same country, and these I think are very useful. It's difficult to find a single universal way of understanding everyone, but I think it's a good starting point.

Finally, within State of the Art in Astronomy Education Hakim Malasan and co-authors Rosa M. Ros, Chatief Kunjaya, Endang Soegiartini, Aprilia, and Riska Romadhonia talk about “Empowering science teachers in Indonesia through NASE workshops.” Here they provide a four-year review of NASE workshops in Indonesia. They begin that their first Network of Astronomy for School Education Network (NASE) was held at Machung University in East Java in 2017. In 2018 and 2019 NASE workshops were held at the Institut Teknologi Sumatera in Bandar Lampung, Lampung Province, and in 2020 virtually hosted by Institut Teknologi Bandung in Bandung, West Java Province. They outline the great value that NASE workshops provide and the significant impact that each had with teachers in Indonesia.

Following the talk Muhammed Hafez bin Ahamat Murtza asked:

What is your opinion teaching astronomy using local folklore?

and Hakim replied:

Yes, that is what we try to do in Indonesia, especially for the local teachers. By bringing them to visit and investigate local archeological site and stimulate them with many star lores would in fact gain their enthusiasm and pride.

Poster presentations were included for each session as well. A listing of them by session has been added as an appendix.

The IAU Strategic Plan 2020–2030, a blueprint for forging a new social revolution in astronomy and for using astronomy as a tool for building a progressive society

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Abstract. I discuss the second IAU Strategic Plan for the decade 2020–30 in the context of the overall evolution of the IAU in recent past decades. This article shows how the IAU has evolved dramatically since WW2. It is hardly recognizable in terms of its original organization and goals of a century ago. What was once an inward-looking body engaged purely with the procedures of astronomical research is now a dynamic and outward-looking organization, interacting with people, especially students and the public.

A large part of this success must be attributed to the IAU's unique body of individual members, whose number has grown strongly in recent decades. It is the individual members, especially through the Commissions and Working Groups, who have promoted these enormous changes in the outlook of the Union. This is a model for other scientific unions to follow, and especially for the work to promote the careers of women in science, for promoting the careers of young astronomers, for bringing students into astronomy or into science in general, for helping people with disabilities to have careers in astronomy, for engaging with the public, and for helping to develop astronomy and science in developing countries.

Looking to the future, the IAU's new Strategic Plan for the years 2020 to 2030 has five major goals for the coming decade: 1. The IAU leads the worldwide coordination of astronomy and the fostering of communication and dissemination of astronomical knowledge among professional astronomers. 2. The IAU promotes the inclusive advancement of the field of astronomy in every country. 3. The IAU promotes the use of astronomy as a tool for development in every country. 4. The IAU engages the public in astronomy through access to astronomical information and communication of the science of astronomy. 5. The IAU stimulates the use of astronomy for teaching and education at school level.

Future developments will also be engaging with the large number of amateur astronomers and helping to promote astro-tourism, which is perhaps the new frontier now growing rapidly around the world. The Strategic Plan is a blueprint for forging a social revolution in astronomy and for using astronomy as a tool for building a progressive society.

Keywords. IAU Strategic Plan, IAU individual members, a social revolution in astronomy, amateur astronomers, astro-tourism

1. Introduction

The International Astronomical Union (IAU) was founded on 28 July 1919 in Brussels by the International Research Council (IRC). It was one of the first of the new scientific unions to be formed in the era immediately following the Great War. However, the International Solar Union had preceded it (formed by Hale in 1904), as had also the



Figure 1. The first IAU General Assembly, Rome 1922. Note the paucity of female astronomers and the preponderance of old men.

Astrographic Congress, which dated back to 1887. These last two organizations were examples of international co-operation in astronomy from earlier decades.

In 1919 the IAU operated like a club for about 200 astronomers to discuss classification schemes, standards for measurement and collaborations. In this sense it was a closed and rather esoteric society for its members, who were a small fraction of scientists and an even smaller and largely invisible niche in society as a whole. The original IAU was neither fully international nor global, as the original members came from the USA, and Europe but excluded Germany, Austria, Hungary, Bulgaria and Turkey (the Central Powers of WW1). West Germany only became a national member in 1951 and most of the other Central Powers did so over the ensuing decade (though Hungary became a member in 1947)

The IAU was formed ‘to promote and safeguard the science of astronomy in all its aspects through international cooperation’. From the birth of the organization, a triennial General Assembly (GA) was seen as the best way to promote these aims. The first GA was held in Rome in 1922, when just 83 astronomers participated (Fig. 1). The most recent was in Vienna in 2018 (the 30th GA) with about 3000. Currently, the IAU has 82 national members and over 11 000 individual members who are professional astronomers (generally with a PhD and employed in astronomy).

The structure of the IAU with both national and individual members made the Union fairly unique amongst scientific unions. But the presence of individual members, in due course, was found to be one of the key elements of the IAU’s success. The individual members represent a task force of dedicated professionals who interact with each other globally to promote the aims of the Union. Because they feel a strong sense of belonging and of personal engagement in the affairs of the Union, this has proved to be a potent force for promoting the science of astronomy.

More information on the IAU and its history can be found in two recent publications (Sterken *et al.* 2019, Andersen *et al.* 2019).

2. Evolution and transformation of the IAU over 100 years

By the end of WW2, it was realized that an important component in promoting astronomy was to facilitate international collaboration. The triennial GA was not enough to meet these goals, and hence a new IAU commission for the Exchange of Astronomers was proposed. Commission 38 thus came into being in 1948 at the GA in Zürich. It helped fund exchange visits of astronomers between member countries, by supporting travel costs, but not living expenses or salaries. The typical duration of an exchange was three months or more. Travel grants were awarded for over six decades by the exchange of astronomers programme, from 1947 to 2009 and a total of 558 astronomers benefitted from these grants. Many came from developing countries (Hearnshaw 2019).

Commission 38 represents the first time the IAU started promoting people rather than just the modalities of how to carry out research. It was also notable as being the only one of two commissions to have funding and a budget (the other was C46 for the teaching of astronomy).

Commission 46 for the Teaching of Astronomy was established in 1964, largely on the initiative of Jean-Claude Pecker (France) and Marcel Minnaert (Netherlands). This in turn led to the first International School for Young Astronomers (ISYA) being held in Manchester in 1967. Graduate students at PhD and MSc level were the participants for these schools. For the first time the IAU was focussing attention on students. This represents a further important step in the Union's development as being more of a people-focussed organization rather than purely research-focussed.

It is notable that at the present time 42 ISYA schools have been held, and about 1500 students have participated in these ISYA. Many have gone on to distinguished professional careers in astronomy.

In 1994 the IAU began to be interested in promoting astronomy in developing countries. This was the year that the Working Group for the World-wide Development of Astronomy (WGWWDA) was established, with Alan Batten (Canada) as chair. The WGWWDA organized visits to developing countries, to give lectures, encourage research collaborations and promote IAU membership.

3. IAU structure

In 1919 the IAU was founded with an Executive Committee and 32 commissions covering most branches of astronomical research. Although some commissions were disbanded and new ones created, this structure proved to be inflexible as the size of the individual membership grew rapidly after WW2.

At the 1994 GA at the Hague, a structure with 11 divisions was adopted with commissions being attached to a division. By 2009 this structure had evolved to nine divisions and the 35 commissions and 53 working groups that we have today. Notably, Division C covers the non-research activities of the Union, and in particular C1 is for astronomy education and development, C2 for communicating astronomy with the public, C3 for the history of astronomy and C4 for world heritage and astronomy. It is this Division for Education, Outreach and Heritage that has driven the transformation of the IAU and represents the face of its new-found social awareness.

A major new initiative came in 2009 at the time of the GA in Rio da Janeiro. It was here that the first IAU Strategic Plan 2010-20 was approved, which included establishing an Office of Astronomy for Development, which would have a small number of professionals who aim to use astronomy to promote economic development in developing countries. The OAD office was established in 2010 in Cape Town with Kevin Govender as its director, and is co-sponsored by South Africa's National Research Foundation, NRF.

OAD took over many of the functions of the former WGWWDA and another education commission working group, Teaching Astronomy for Development (TAD).

The success of OAD has led to three further offices being established. The IAU Office for Astronomy Outreach (OAO) was opened in 2012, being hosted and supported in Tokyo at the National Astronomical Observatory of Japan. Dr Hidehiko Agata is the supervising director and Lina Canas is the international outreach coordinator at OAO. The IAU Office for Young Astronomers (OYA) was established in Oslo in 2015. It is funded by the Norwegian Academy of Science and Letters and in turn supports the ISYA schools. OYA has no professional staff. On the other hand, ISYA has appointed a director and deputy director to coordinate up to two schools per year. They are Drs Itziar Aretxaga in Mexico and David Mota, a Portuguese astronomer based in Oslo. The IAU Office for Astronomy Education was established in 2019 in Heidelberg, Germany. It is hosted by the Haus der Astronomie of the Max Planck Gesellschaft and is funded in part by the Klaus Tschira Stiftung and the Carl-Zeiss-Stiftung. Dr Markus Pössel is the inaugural director.

The IAU thus has now a considerably more complex and multi-layered structure than was the case a century ago. The Executive Committee (EC) comprises twelve members, including the president, president-elect, general secretary and assistant general secretary, and six vice-presidents and two advisors. The secretariat, based permanently in Paris at the Institut d'Astrophysique, has two staff members dealing with finance and administration. Under the EC are nine divisions, 35 commissions, 53 working groups and four offices. The membership of the Union comprises 82 national members, 11801 individual members of whom 716 are junior members. Junior membership is a new membership category introduced in 2018 for those astronomers who have completed a doctoral thesis within the last six years.

4. A social revolution has been launched

The last fifty (almost sixty) years have seen a remarkable transformation in the way the IAU operates. It has become very much a people-focussed organization that not only promotes the science of astronomy with these new ways of operating, but also aspires to promote social change and development in society using astronomical advances as a tool to promote science, equity and inclusion more generally.

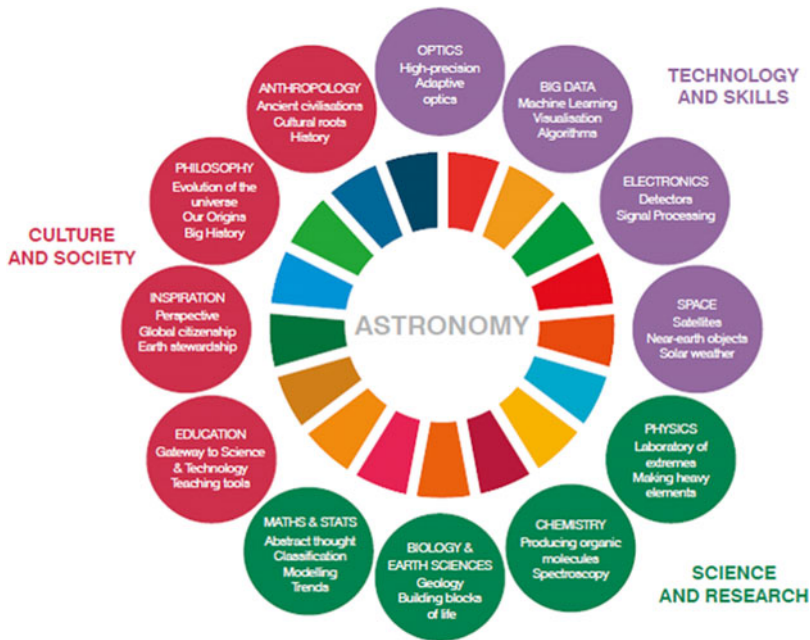
Several key examples can be cited for how the IAU now operates to achieve these new goals.

- (a) The IAU has established several working groups that promote social change. These include the WG for Women in Astronomy (2003), the WG for Equity, Diversity and Inclusion (2015) and the WG for Junior Members (2018). All these are WGs directly under the Executive Committee. We can also cite the WG for Dark and Quiet Skies Protection, which has been proactive in 2020 in producing a report for the UN Committee on the Peaceful Uses of Outer Space (COPUOS). This report has widespread implications for the growth of astro-tourism and people's appreciation of an unpolluted starry night sky, as well as for the progress of astronomical research.
- (b) The IAU has established itself as a role-model for promoting women in astronomy by appointing four women to serve as IAU president since 2006, and the Union will have three consecutive female presidents from 2015 to 2024. The female presidents of the IAU are
 - Catherine Cesarsky (France) 2006–09
 - Silvia Torres (Mexico) 2015–18

- Ewine van Dishoeck (Netherlands) 2018–21
 - Debra Elmegreen (USA) 2021–24
- (c) The IAU in 2009 organized the International Year of Astronomy, a world-wide celebration of the 400th anniversary of the first observations of the night sky with a telescope by Galileo. The IYA2009 was endorsed by the United Nations General Assembly. Hundreds of public events were organized in 148 different countries, and there were 12 Global Cornerstone Projects that involved the whole world. It is estimated that 815 million people world-wide were exposed to some aspect of astronomy by IYA activities during 2009. This is more than ten per cent of the entire world population ([Cesarsky 2019](#)).
- (d) Strong support is given by the IAU to early-career astronomers, through the ISYA schools and the Junior Members programme. In 2015 the IAU also initiated a programme of prizes for the best PhD theses which were submitted world-wide. Up to ten prizes annually are offered.
- (e) Support is given to developing countries to encourage the world-wide growth of astronomy education and research, through OAD. Promoting astronomy in Africa has been an especial area of interest. However there are also now ten regional offices of astronomy for development (ROADs) and two offices which are language centres that can translate stories and news in English into respectively Portuguese and into Chinese (LOADs).
- (f) The IAU gives support to the hearing impaired with sign language for astronomical terms, and to people with other disabilities to enable them to embark on astronomical careers or assimilate astronomical news. The recent IAU symposium in Tokyo, IAUS 358: Astronomy for Equity, Diversity and Inclusion - a roadmap to action within the framework of the IAU 100th Anniversary highlighted the progress in these fields.
- (g) In 2020 the IAU published a new Code of Conduct for all its members (see [IAU Code of Conduct 2020](#)). This included Anti-harassment Guidelines and also a Code of Ethics. The former article is designed to eliminate sexual harassment at IAU meetings, and also incidents such as verbal abuse. The second is designed to eliminate plagiarism and give due recognition to junior authors in multi-author publications.
- (h) The IAU has actively promoted several prestigious prizes offered in astronomy and cosmology. These are of course conferred on the elite few with outstanding achievements in their professional careers. However the prizes also promote astronomy in the eyes of the public, given the widespread media attention the recipients receive. The prizes include the Gruber Cosmology Prize, the Kavli Prize, the Shaw Prize and of course Nobel prizes when the prize in physics goes to an astronomer. It is notable that 24 Nobel Laureates have been awarded in astronomy since 1967, half of them in the last decade. If Boyle and Smith are included for their pioneering work on the CCD which has had such an influence on observational optical astronomy, then the number is 26 Nobel laureates since 1967.

We can reflect on why and how the IAU has been so successful in being socially proactive and a role-model for other scientific disciplines and other scientific unions. Probably three key factors have facilitated these changes:

- The IAU has a large number of individual members who are actively engaged in the affairs of the Union, especially working in the Commissions and Working Groups.
- The science of astronomy is visually very rich in images, and many discoveries therefore receive attention in the world's media with images of the latest discoveries, including those from current space missions. This has resulted in a large following by the educated



Connections of astronomy with other disciplines. The colours in the inner ring represent the colours of the UN Sustainable Development Goals (SDGs) to which astronomy can contribute (this "wheel" is a re-envisioning of the wheel on the cover of the Strategic Plan 2010–2020).

Figure 2. Connections of astronomy with other disciplines. From the IAU Strategic Plan 2020–2030.

public on the progress of astronomical research, especially discoveries such as black holes, the big bang, cosmic expansion at one end of the distance scale, and also solar system exploration of objects closer to Earth.

- Astronomy has hundreds of thousands of amateur astronomers world-wide, many of whom own their own small telescopes and some of whom are actively engaged in useful research, generally in stellar astronomy such as variable star observations. This fact is rather unique amongst the sciences, and certainly has resulted in a widespread interest in astronomy from the general public.

5. The IAU Strategic Plan 2020–2030

At the 30th GA in Vienna in 2018, the second IAU Strategic Plan for the decade 2020 to 2030 was approved (Elmegreen & van Dishoeck 2018). It was largely written by president-elect Debra Elmegreen and by IAU president Ewine van Dishoeck. The new Strategic Plan follows on from the success of the plan for the previous decade and builds on the progress of the IAU over the previous century, especially in the transformation in the previous half century to become more people-focussed and socially proactive.

Astronomy has links to many other disciplines and branches, including to culture and society. Fig 2 is from the IAU Strategic Plan, 2020–30. These links to other disciplines of scientific and social endeavour highlight the strength of astronomy as a multi-disciplinary science, which is a key element of its success.

The new IAU Strategic Plan for the coming decade has five main goals as shown in Fig. 3. The first concerns the core function of the Union, namely astronomical research, but also the dissemination of the scientific knowledge acquired to the wider community.



Figure 3. Five goals of the IAU for the coming decade. From the IAU Strategic Plan 2020–2030.

The following goals concern the world-wide development of astronomy as a science in all countries, especially the inclusive advancement of women in astronomy in all countries, and the use of astronomy for economic development, for outreach and communication to the public, and for teaching and education at school level. These last four goals are the socially proactive ones that characterize the present ambitions of the Union.

The following comments highlight some of the achievements already made on each of these goals, and also on future prospects.

- (a) For goal #1, there is an extraordinary range of new investments underway to explore the entire electromagnetic spectrum coming from the universe and observed either from the ground or from space. In addition, the new science of gravitational wave astronomy and the relatively new field of neutrino astrophysics will complement electromagnetic observations. Deep space missions will continue the



Some potential contributions of astronomy to the Sustainable Development Goals.

Figure 4. Over half of the UN’s Sustainable Development Goals are supported by OAD projects From the IAU Strategic Plan 2020–2030.

- exploration of solar system bodies. The projects include three extremely large telescopes, the James Webb space telescope, the Square Kilometre Array (SKA), the Vera Rubin telescope and advanced LIGO and Virgo gravitational wave detectors.
- (b) For goal #2, it is noted that women comprise 11 to 20 per cent of individual IAU members in many developed countries. A handful of countries including France, Italy, Romania, Bulgaria, Brazil and South Africa have 21 to 30 per cent women. Very few national members have more than 30 per cent women astronomers, but they include Argentina and Thailand. As for the geographical distribution of astronomers, Africa is still very much under-represented when it comes to IAU members. Overall, there has been much progress, but clearly there is much still to do.
 - (c) For goal #3, the establishment of the OAD in 2012 in Cape Town represents one of the great successes of the IAU. Since 2013, 200 development projects have been funded in many countries which span the entire world (though as it happens not yet in Australia or New Zealand). This work has been under OAD director Kevin Govender. The work of OAD has been aligned with the seventeen UN Sustainable Development Goals and the claim in the Strategic Plan is that the OAD impacts on at least eight of the 17 UN goals. This is illustrated in Fig. 4.
 - (d) For goal #4, the OAO office in Tokyo has appointed National Outreach Coordinators (NOCs) to represent 127 countries (far more than the number of national IAU members). The NOCs form a supportive network of astronomers and outreach professionals taking astronomy to their local communities. This has been one of the principal successes of the Office for Astronomy Outreach. We can also mention the IAU/UNOOSA/IAC conference on Dark and Quiet Skies for Science and Society, to discuss light pollution’s impact on astronomy, and also the adverse impact of radio noise and of satellite constellations. This was an on-line

conference in October 2020 with nearly 1000 registrations. A 270-page report has been prepared for the UN committee COPUOS. Other work of the OAO, under Hidehiko Agata and Lina Canas is the CAP Journal, a peer-reviewed journal published twice a year, and the CAP Conference, held approximately every second year. (CAP is Communicating Astronomy to the Public).

- (e) For goal #5, the IAU established the Office for Astronomy Education (OAE) in Heidelberg, Germany in 2019. It is hosted in the Haus der Astronomie of the Max Planck Institute for Astronomy with Markus Pössel as director. The appointment of National Astronomy Education Coordinators (NAECs) in many countries is underway. The OAE will analyse astronomy teaching in IAU countries and identify accessible materials and astronomy literacy guidelines. It will encourage standards for teacher training activities and it is planned to organize an annual International School for Astronomy Education (ISAE). The annual Shaw Prize-IAU Workshops on Astronomy Education that OAE will organize are funded by the Shaw Prize Foundation.

6. IAU International Fundraiser

With so many projects and new developments in the IAU's future plans, it is not surprising that these will require new funding. The IAU will expend about 4.2 million euros over the triennium 2022 to 2024, of which some three quarters comes from national member dues. The remainder comes from foundations, donations and royalties.

In April 2020, the IAU appointed a professional fundraiser to raise additional funds for the projects planned. She is Genevieve Marshall from the UK. The initial plan was to raise at least 100 000 euro per annum, perhaps more in later years.

7. Areas where the IAU needs to expand its activities in the future

The IAU has made huge progress in transforming itself into a modern and socially proactive organization supporting the use of astronomy for social change and serving as a role model for other scientific unions and organizations. However, there is still much work to do, and there are some areas where the Union has so far only made some initial steps.

Here are some of the things the Executive Committee could consider for the near future:

- More engagement with the community of amateur astronomers (especially those who want to contribute to research collaborations with professionals).
- Forging strategic alliances for outreach with planetariums, public outreach observatories and museums (with astronomy or space science divisions).
- Promoting astro-tourism in dark sky places. (See Fig. 5 for an example of thriving astro-tourism in New Zealand).
- Support for the [Starlight Declaration \(2007\)](#) on the right of all people to have access to a pristine, dark and starry night sky.

8. Conclusion

The International Astronomical Union has seen a transformation in its *modus operandi* during its first 100 years, especially so in its second half century since the late 1960s. It is now a much more people-focussed organization, serving the interests of astronomers of all nationalities and both genders.

With its second Strategic Plan 2020–2030, we can expect the social revolution to continue, with the aims not only to foster the science of astronomy, but also to help build a more progressive society using astronomy as a tool.



Figure 5. Astro-tourists at Mt John Observatory, New Zealand. Astro-tourism is a possible future area for more IAU engagement. Photo courtesy Fraser Gunn.

There is still much work to do in realizing existing goals, and there are new areas of engagement which the Union should consider tackling in the years to come.

More evolution of the IAU can be expected in the coming decades.

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