



IAU Catalyst, June 2020

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Editorial

These are challenging times, for each of us individually and also for the IAU as an international organisation.

Our projects, our dreams, our plans, and even our daily lives were suddenly suspended. For how long? At the end of May, who dares to answer...

For the IAU, whose mission is to promote and safeguard astronomy in all its aspects — research, communication, education, and development — through international cooperation, the challenge is enormous.

One of the IAU's key activities is the organisation of scientific meetings where astronomers get together to exchange ideas and plan future projects. However, the vast majority of symposia, regional meetings, ISYA and other scientific initiatives planned for 2020 have had to be postponed, or even cancelled, as a result of security measures imposed to combat the Covid-19 pandemic.

Just as we started to implement the IAU's first global strategic plan, conditions changed dramatically around the world. The impact on many of the IAU's planned activities and actions to carry out the strategic plan was enormous. The training of the next generation of astronomers and initiatives to raise public awareness of astronomy, or to use astronomy as an instrument for teaching or development, had to be suspended. Of course, the IAU offices, through their worldwide networks and regional nodes, are reacting proactively to overcome confinement.

On our side, there is the digital technology available, which allows us to have meetings or even conferences and to creatively find alternative ways to carry out various initiatives and activities. That is what the IAU, globally, is doing. We are, after all, entering a worldwide creativity boom in many areas, from performing arts to education and science. We are reacting positively to an unexpected global crisis.

The IAU emerged from a major crisis 100 years ago, and we will do it again, learning from circumstances and trying to find a better balance. We hope to emerge from this severe global crisis with a stronger sense of partnership. We will learn to better value common projects and shared ventures.

And the next General Assembly, in August 2021, will be an inspiring celebration and an occasion to reaffirm our mission and our determination to achieve our shared goals.

Maria Teresa Lago, General Secretary IAU

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Executive Committee

Evolution of the IAU

Robert Williams

IAU President

2009–2012

Modern technology has transformed the way in which communication takes place within the IAU. Strong connections between the members and the executive body of any organisation are necessary if it is to work to its full potential. In decades past the decisions and management work of the IAU Executive Committee (EC) were communicated to the members in written text sent out by mail. In that era, not surprisingly, the culture of the Union was much more formal and primarily internally focused, and activities were developed over a longer time frame than at present.

An example of this was brought to my attention last week when my wife Elaine and I were in self-quarantine in our Baltimore home from the Covid-19 coronavirus, having just flown back from UC Santa Cruz. We decided to entertain ourselves by reviewing all the 35-mm slides we had taken during our life together in order to select those we wanted to keep — an example of the downsizing that occurs when one gets to one's 80s. One of the more remarkable slides that caught our attention was taken in 1967 during IAU Symposium #34 on Planetary Nebulae in Czechoslovakia, at the farewell campfire barbeque in the woods — where I was wearing a tie! Times have changed and continue to change.

With modern electronic communication so omnipresent that sensible people work to avoid becoming addicted to it, the rapid implementation of new ideas is made possible. In the case of the IAU this began in the 1980s with the major re-organisation of the Union that placed increasing emphasis on the Divisions, and it has been strongly reinforced by the recent inclusion of the Division heads in all EC meetings. This inclusion of the broader interests of the Union in policy-making and management meetings has had a significant effect on the activities of the IAU. Most notably, it has changed the IAU into a more outward looking and acting organisation.

Since 2006 the IAU has formulated and updated strategic plans with broad member involvement. These plans have placed increasing emphasis on education and public outreach. There is no question that the impressive technology

of astronomical facilities in the modern era and the discoveries they have made have had a profound impact on societies. Astronomy is not just niche science any more. It can be said that the IAU has played a role in bringing that about. We led the effort to have the United Nations declare 2009 as the International Year of Astronomy, and this had enormous influence in bringing astronomy especially to youth throughout the world. If I can borrow from the famous epitaph for Sir Christopher Wren, who designed London's magnificent St. Paul's Cathedral and is buried in an obscure spot in its subterranean chamber — If you seek his monument, look around you; I could say something similar about the IAU. That is, look at the Office of Astronomy for Development, the Office of Astronomy for Education, the Office for Astronomy Outreach, and the increased effort being put into the International Schools for Young Astronomers. Most of these IAU initiatives began in the last decade and have been instrumental in placing the IAU in major scientific discourses and the media in many countries. This is where we want to be, and my assessment is that the current structure of the Union and its leaders are poised to keep the IAU moving even deeper into this domain. The IAU is continuing to evolve in a way that ensures it is an ever more significant player in world-wide science.

2

IAU Divisions, Commissions & Working Groups

2.1

IAU Division B — Facilities, Technologies and Data Science

Michael Burton
President, IAU Division B

Division B — Facilities, Technologies and Data Science — is one of the IAU's two enabling Divisions (along with Division C). It is also the largest of the Divisions, with 3875 members. After all, telescopes and data are fundamental to our discipline — we all use them in some way or other!

Astronomical research relies on a mixture of technology, systems and processes deployed and operated on the ground and in space. High performance computing and information technology are key components of this mix. Continued innovation in all these areas is integral to achieving greater sensitivity, higher resolution and larger samples across all wavelengths, as well as to processing, analysing and interpreting data sets. International cooperation is also central to these efforts. These arenas are all a part of Division B's remit. For the IAU Centenary we worked with the Executive to produce the booklet "From Medicine to Wi-Fi — Technical Applications of Astronomy to Society" to help explain to the public the practical relevance of the work that we all do in furthering civilisation. You can find it on the IAU's website¹.

The Division has seven Commissions, relating to enabling astrophysics via the means of computational (B1), data & documentation (B2), informatics & statistics (B3), radio (B4), laboratory (B5), photometry & polarimetry (B6) and site protection (B7).

The Division also hosts three Working Groups (WG) (Information Professionals, Time Domain, and UV), together with an Inter-Division WG (with E) on solar observations. Within the Commissions there are also further WGs (four in B2, 2 in B5 and 2 in B7), plus another two that are Inter-Commission WGs.

The Division regularly coordinates IAU Symposia, the next one being IAUS362 on "the predictive power of computational astrophysics as a discovery tool" (though postponed to June 2021 owing to the current situation with COVID-19). Go get the data!

Notes

¹ www.iau.org/news/announcements/detail/ann19022

Over the past century we have witnessed a profound change in the nature of the IAU, from an inward-looking body, mainly men, who researched astronomy, to an outward-focused group, now nearing gender equality, with a charter to take astronomy to the world and help create a better planet for human beings. But if we wish to focus on the present and the future we also need to understand the past, for it alone provides the foundations upon which we can build.

Commission C3 (which began life in 1948 as Commission 41) is committed to researching and documenting the past, be it the history of the IAU itself — as portrayed through the highly successful “Centenary Symposium” we held at the Vienna GA — or the achievements of the colossi of astronomical history, Ptolemy, al Sūfī, Copernicus, Galileo, Kepler, William Herschel, Hale, Einstein, Hubble, and a multitude of others. But history of astronomy (HoA) is much more than this. It is also about scientific instruments, the observatories in which they were housed, the types of research they were used for, and the politics of astronomical development.

For C3 it is also about taking advantage of unique opportunities: capturing the contributions of surviving pioneers of radio astronomy (so we formed the Historical Radio Astronomy WG in 2003), or documenting indigenous astronomical knowledge around the world before it is too late (again through a specialist WG, where our motto is “It’s Now or Never” — with apologies to the immortal Elvis Presley!). Because of the wide-ranging nature of HoA research carried out by C3 members, WG’s have a vital role to play.

One problem we face in C3 is the super-abundance of “mature-age” members. Younger people are interested in HoA, but there are few jobs available in this very specialised field. So we encourage astrophysics graduate students to also carry out small-scale HoA projects (especially in ethnoastronomy). Having publications in astrophysics and HoA enhances their career options, and their competitiveness when seeking post-docs (and IAU membership).

2.2

Invitation to Explore
our Exciting Past,
Highlight
the Present
and Plan
for the Future

Wayne Orchiston
President of Commission
C3 History of Astronomy

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IAU Divisions, Commissions & Working Groups

Figure 1: Part of the 32-element Chris Cross solar grating array near Sydney, used by the current President of C3 back in the 1960s. Credit: John Leahy.

HoA also has a key educational role to play. Many lay people are proud of their heritage, but are intimidated by the complexity of contemporary astrophysics. We can use HoA in a non-threatening way to introduce them to astronomy. More than this, we would like to see more C3 members giving introductory overview papers at IAU Symposia, Focus Meetings and Regional Astronomy meetings. Similarly, all NASE Workshops will benefit if they include an HoA component. C3 is a unique Commission, and it has much to offer the IAU.



Generally speaking, astrobiology concerns the study of life in the Universe. More specifically, it includes the study of the conditions and processes that allowed the emergence of life on our planet, or could have allowed it elsewhere in the Universe, the study of the evolution of organic matter towards complex structures in the Universe, and research that concerns the distribution and evolution of life in all its forms.

In order to coordinate training, education and outreach activities in astrobiology at the international level, we created the Working Group on Education and Training in Astrobiology in 2015. It is supported by the Commissions C1 Astronomy Education and Development, F2 Exoplanets and the Solar System, F3 Astrobiology and H2 Astrochemistry.

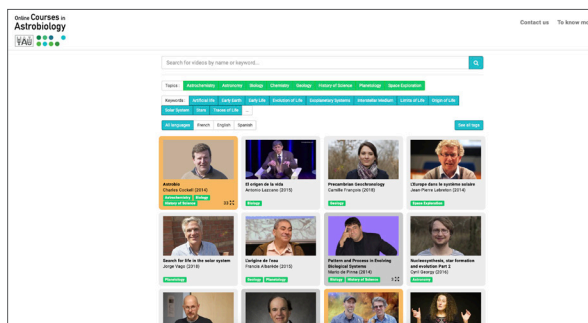
Since 2015 we have pursued 5 goals:

- To collect together all lectures and conferences in astrobiology which have been recorded during the last 10 years (in whatever language), to categorise them according to their field and the public concerned (from general public to specialists in the field), and to make them available for free on a platform: <http://astrobio-video.com/en/>. So far 3 languages are available: French, English and Spanish.
- To produce handbooks and Massive Open Online Courses (MOOCs) for university students, pooling the indi-

2.3

WG on Education and Training in Astrobiology

Muriel Gargaud
CNRS/University
of Bordeaux,
France Chair



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IAU Divisions, Commissions & Working Groups



vidual national efforts that are already under way across the world. Five MOOCs have been produced so far.

- To develop outreach for the general public and high school teachers. The book “La plus grande histoire jamais contée” published in French (Belin, 2017) has been recently produced in Chinese by Jianxi Education Publishing House (2019), and the book “Young Sun, early Earth and the origins of life” (Springer, 2012) has been updated and published in Japanese by Nishimura Publisher (2020).
- To create an annual international astrobiology training school (TS) to train the young generation in the basics of astrobiology: <http://www.exobiologie.fr/red/index.php/en/red16-astrobiology-course/> and to organise as often as possible a 2-day TS on the basics of astrobiology before each international conference (so far: Hanoi, Vietnam in 2016 and 2019, Santiago, Chile in 2017, Vienna, Austria in 2018, Johannesburg, South Africa in 2020). All these lectures are recorded on the astrobio-video platform.
- To organise a regular international workshop on education in astrobiology in order to discuss how to carry out multidisciplinary training in astrobiology and how to evaluate students, and above all to share all training materials that each country may have developed but not released (for example, Utrecht, the Netherlands in 2017: <https://ise2a.uu.nl/>).

In mid-February, the IAU100 celebrated its final global project with the Pale Blue Dot initiative that reflected on the iconic image taken by the Voyager-1 mission 30 years ago. How quickly our world can change: around the same time, countries worldwide started to lock down in order to contain the corona virus pandemic. During these uncertain times, the IAU100 theme Under One Sky has remained as strong as ever, as we find new ways to connect with people worldwide and help each other.

This is an appropriate moment to reflect on the 100-year celebrations. It was realised from the start that IAU100 would be significantly smaller than IYA2009, but the global team has exceeded expectations. IAU100 implemented over 5000 activities in 143 countries, highlighting the science, technology, education and culture associated with astronomy. They involved the direct participation of 5–10 million people and reached an estimated > 100 million people.

IAU100 consisted of 11 global projects and various grass-root local activities. An overview can be found in the article by the IAU100 Coordinator Jorge Rivero in Catalyst no. 2 and in the final IAU100 report. The IAU100 legacy will continue as several global projects are handed over to the OAO.

The Moon had a central place in IAU100 with the largest worldwide coordinated action during the celebration of the 50th anniversary of the Moon Landing. Since the dawn of mankind, the Moon has been an integral part of our culture. In today's era of social distancing, the words of the Chinese poet Li Po (701–762 CE) in Drinking alone by Moonlight resonate: "...lifting my cup, I asked the Moon to drink with me..."¹. Standing alone under the Supermoon in April, I drank a toast to all the people who made IAU100 possible and to the next 100 years of the IAU!

3.1

Under One Sky continues as IAU100 comes to an end

Ewine van Dishoeck
IAU President

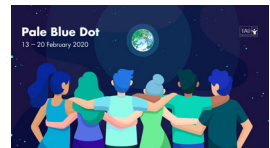


Figure 2: *Book of the Moon*, M. Aderin-Pocock (Penguin Random House).

3.2

1st Shaw-IAU Workshop on “Astronomy for Education”

Maria Teresa Lago
IAU General Secretary

Implementing the recent collaboration between the IAU and the Shaw Prize Foundation, the 1st Shaw-IAU Workshop¹ was organised by the IAU Secretariat and held from 17 to 19 December 2019, in the auditorium of the IAP (Institut d’Astrophysique de Paris), where the IAU headquarters is located. The objective of this first workshop was to establish a solid foundation for a global collaborative network to support an open and inclusive IAU Office of Astronomy for Education (OAE).

The workshop involved 48 invited or selected participants² from among the many applicants, from 26 countries.

This workshop provided an excellent opportunity for the IAU General Secretary to summarise the international call and the selection process, as well as the objectives of the OAE.

The designated Director and Deputy Director of the OAE presented the plans for the new office, with an emphasis on achieving the goals expressed in the IAU Strategic Plan for 2020–2030.

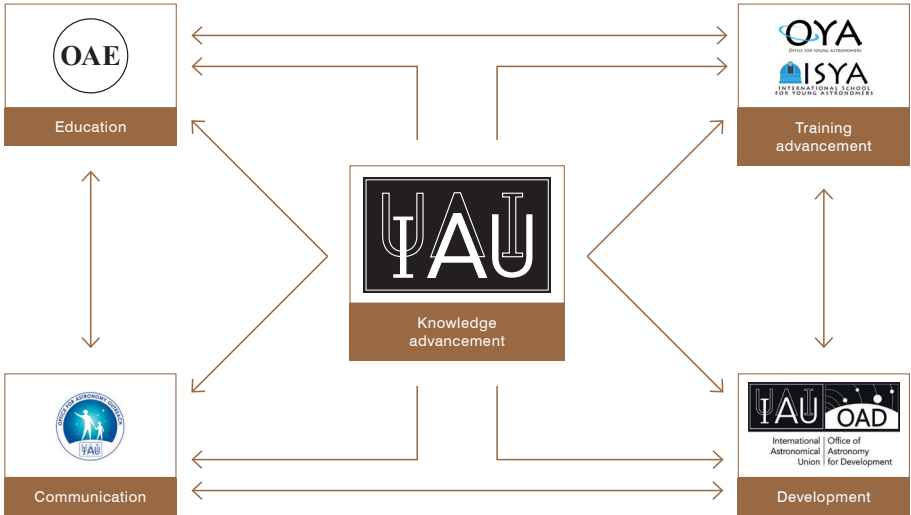
Invited speakers addressed the infrastructure needs for astronomy education. Presenters included interested parties such as runner-up OAE proponents, who described possible options for the OAE Nodes and Centres and how to create synergies in the future.

The Workshop was also used to sign the agreement between the IAU and the Max Planck Institute for Astronomy in Heidelberg, establishing the IAU Office of Astronomy for Education location in the Haus der Astronomie in Heidelberg, Germany. The workshop participants were witnesses of this ceremony.

Notes

¹ https://www.iau.org/static/education/oad/shaw_iau_oae_workshop_programme.pdf

² https://www.iau.org/static/science/grants_prizes/shaw_prize_foundation/workshop/past/2019-participants.pdf



4 Scientific Meetings

4.1

Astronomy for all Busan 2021

Hyesung Kang
Chair of the
IAUGA2021 LOC

The 31st General Assembly of the IAU (IAUGA2021) will be held in the Busan Exhibition and Convention Center (BEXCO) in Busan, South Korea from 16 to 27 August 2021. IAUGA2021 will be jointly hosted by the Korean Astronomical Society (KAS) and the Korea Astronomy and Space Science Institute (KASIS). Scientific programmes, including 6 symposia, 12 focus meetings, and 9 Division meetings, will take place alongside other IAU related meetings. Exciting social events, including Korean traditional performances, will be organised as well.

The host city of Busan is the second-largest city in South Korea, located on the southeastern coast. You will find modern yet reasonably priced accommodation near the famous Haeundae Beach with many restaurants and stores nearby. There are abundant tourist attractions, including beaches, parks, walking trails along the seaside, and Buddhist temples. The venue, BEXCO, has emerged as the most competitive exhibition and convention centre in northeast Asia, with a state-of-the-art auditorium that seats more than 4000 delegates, 49 meeting rooms and ample exhibition spaces.

In honour of the IAU's mission, the LOC recognises the importance of continuing international cooperation among its members from all around the world. Hence, we chose "Astronomy for All" as the main theme for IAUGA2021 to promote more inclusive interactions among the participants. To that end, we have established a special travel grant, which will complement the traditional IAU travel grant, to encourage more young students and junior postdocs to attend the GA in Busan. Complimentary childcare services will be provided to support attendees with small children. Details of the KAS grant and childcare services will be announced later this year on the meeting website¹.

Notes

¹ <http://www.iauga2021.org/>



Figure 3: The official logo of the 31st General Assembly contains images from a traditional painting of the Joseon Dynasty and the Gwangandaegyo in Busan. The main theme of IAU GA2021 is “Astronomy for All” and the bridge symbolises the idea of “connecting astronomers from all around the world”.



Figure 4: Inworobongdo (Sun and Moon above Five Peaks).



Figure 5: Gwangandaegyo aka Diamond Bridge in Busan.

4 Scientific Meetings

4.2

How the American Astronomical Society Will Organise a Virtual Scientific Conference

Kevin B. Marvel
Executive Officer,
American Astronomical
Society

By mid-March it was clear that the coronavirus pandemic was going to seriously disrupt our lives. Officials in Madison, Wisconsin, where we'd been planning to hold our 236th meeting in early June, declared a public health emergency and recommended against holding large gatherings. The AAS Board of Trustees accordingly voted to cancel our in-person meeting but asked the Society's staff to convert it into a virtual one.

I met with our team to outline what we wanted to accomplish. Our goal was to provide the same scientific value online as we do in person, with a focus on maximising attendee engagement. We wanted to present quality content with high production values whilst enabling human connections among researchers.

We rapidly evaluated a wide range of possible technology solutions. Among the criteria we emphasised were compatibility with commonly used devices and operating systems, flexibility of setup and configuration, vendor commitment to reliability and support, level of access control and security, and ease of use.

It didn't take long to realise that we could convene a virtual meeting that would include most of the content of a regular in-person meeting. The tools we settled on include these:

- Zoom — for: plenary lectures by prize winners and other distinguished astronomers; parallel sessions of short talks by everyone from students to senior scientists; "town hall" meetings with representatives of government agencies, space-science missions, and ground-based observatories; and press conferences for reporters.
- iPosters — for digital interactive "posters" with options including audio narration, videos and animations, zoomable images, and the ability for the presenter to interact with remote viewers via chat; also, when combined with Zoom, for iPoster-Plus sessions, i.e., short talks based on iPosters.

- vFairs — for a virtual exhibit hall where organisations can display and promote products and services and interact with attendees, and for an online networking lounge.

Aside from shortening the meeting to three days and making a few other changes, our virtual #AAS236 will be an online version of a regular summer meeting. Access to most of the content will be restricted to those who register; our registration fees are substantially lower than those for an in-person meeting, mainly because we don't have to pay for space rental and catering.

The meeting takes place 1–3 June, and registration is open until 29 May. We've received 631 abstracts and have more than 750 people registered as of late April. We hope that many astronomers outside North America will choose to join us too, especially since there are no travel or lodging costs involved. For more information, see the meeting website and read the longer version of this article at [AAS.org](https://www.aas.org).

We hope all our colleagues around the world remain healthy and engaged during this difficult time. Science is fundamentally important to advancing human knowledge and is one of our highest callings as a species. Moving research forward under these circumstances is challenging at both the personal and institutional levels. We must facilitate that effort despite the challenges we face. The AAS will continue to publish our journals, assist our members, and seek to engage researchers worldwide through our conferences, whether virtual or in person.

5 IAU Offices

5.1

The IAU Paris Office

Maria Teresa Lago
General Secretary

The small but very active “heart” of the IAU!

The IAU Office is generously hosted by the CNRS-INSU at the Institut d’Astrophysique de Paris (IAP) at Boulevard Arago 98 in Paris. Located on the 2nd floor of the IAP, it includes three offices (General Secretary, Head of Administration and Database Manager/Assistant) and an archive/storage room. The fellow members of the IAU who come to visit us — and who are always welcome — usually comment: Is that it? So much work for the IAU coming out of such a small central office?

Yes, it is from this small space that the IAU is managed, of course mainly on line in recent years. Naturally, the IAU Secretariat includes other vital elements, all connected digitally like all of us members of the IAU. Namely, the Assistant General Secretary (at Instituto de Astrofisica de Canarias, Spain), the Press Officer (at ESO & AURA) and the small IAU IT support team of Webmaster and Advanced Projects Coordinator (at ESO).

It is also in the Paris Office that the annual Officers Meeting is held each February for three days.

The next time you come to Paris, we will be delighted to welcome you for a friendly chat and an aromatic coffee. See you at the IAU Office in Paris!



Figure 6. IAU Office in Paris Credit: Institut d’astrophysique de Paris.

The Office of Astronomy for Development (OAD) has, since its launch in 2011, consistently engaged internationally with key individuals, organisations and groups in order to realise its founding vision of “Astronomy for a better world”. The annual call for proposals, launched in 2012, has been a cornerstone of the OAD’s activities, opening up the opportunity for anyone anywhere in the world to come up with ways to use astronomy for development (as compared to developing the field of astronomy or conducting education and public outreach activities).

Part of the strategy of the OAD is to coordinate global “flagship” or “signature” projects, which would be implemented on a much larger scale than those implemented through the annual call for proposals. Such projects would be funded through external fundraising, and are seen as an effective means to achieve significant impact in astronomy for development over a substantial part of the world.

Currently, there are 3 flagship projects:

1 Sustainable, local socio-economic development through astronomy.

This flagship aims to use an astronomical facility, such as an observatory or planetarium, as a “hub” within a small town or village to stimulate socio-economic benefits for the local community. Benefits could include: job creation through astronomy-related tourism; community skills development; educational programmes; stimulation of local innovation; activities that divert the youth from negative/harmful activities; and infrastructure development. Sustainability of such an initiative will be ensured through strong partnerships and collaborations with government, industry, and academic and development partners, including local and traditional leadership.

2 Science diplomacy through astronomy: celebrating our common humanity.

Astronomy brings us a unique perspective on the beauty and scale of the Universe. Most famously, Carl

5.2

Office of Astronomy for Development

Flagship projects and development in the time of Covid-19

Vanessa McBride,

Kevin Govender

& Ramasamy Venugopal

OAD Staff

5 IAU Offices

Sagan used this perspective to try to influence how people interact with each other, and our planet, through his description of the earth as a “pale blue dot”. This project aims to take the inspiring potential of astronomy and use it to stimulate a sense of tolerance, common humanity and global citizenship across the world. The project is being led by the European Office of Astronomy for Development, based in Leiden, the Netherlands.

3 Knowledge and skills for development.

This flagship focuses on the use of astronomical knowledge, and the skills used in astronomy, to tackle development challenges. This includes methods widely used in the field, such as data handling, data analysis and machine learning, as well as the necessary computing facilities. Projects under the flagship may take the form of advanced educational programmes, “hackathons”, competitions or other original interventions that focus on knowledge transfer and/or applying these skills to development problems.

Special project on Covid-19

The OAD also embarks on special projects on strategic or globally relevant topics. Since the onset of the Covid-19 pandemic the OAD has looked at ways in which the astronomy community can play a role in addressing this global crisis or at least helping to mitigate some of its effects. In March the OAD teamed up with the other IAU offices to launch a call to action (<https://bit.ly/CovidCallAction>) which remains open. In April an OAD Fellow, Dr Marie Korsaga, was appointed to look specifically at COVID-19 initiatives around the world in order to assess how the global astronomy community is currently contributing to the alleviation of the crisis, and, importantly, to try to explore and understand new ways in which the astronomy community can potentially contribute, in partnership with relevant experts. We welcome any thoughts or input from readers of this article.

For more details of these projects, visit the OAD website at www.astro4dev.org.

The Office of Astronomy for Education (OAE) is the newest addition to the family of IAU Offices. Many members of the wider IAU community — astronomers and educators — are very active when it comes to bringing the fascination of astronomy into primary and secondary schools. The OAE will support those activities. Looking for a specific educational resource? There should be a database helping you to do just that. Interested in finding out how you can evaluate your activity or resource? Our “OAE Reviews” will have you covered, providing you with the information you need in compact form. Last but not least, OAE is creating a strong network of “National Education Contact Teams” (NAEC Teams) to act as liaisons with each country’s astronomy education community.

The OAE is hosted by Haus der Astronomie in Heidelberg, a Center for Astronomy Education and Outreach operated by the Max Planck Society, Germany’s largest organisation for basic research, specifically by the Max Planck Institute for Astronomy. Financial support is provided by the Klaus Tschira Foundation and the Carl Zeiss Foundation. Ever since we got the go-ahead from the IAU and our funders, we have been working to make the OAE a reality — with considerable help from the astronomy education community, which took part in intense discussions about the future tasks and role of the OAE at the First Shaw-IAU Workshop at the IAU headquarters in Paris, December 17–19 2019, funded by the Shaw Prize Foundation.

By now (April 2020), we have hired an organisational assistant and an interim OAE coordinator, and we are about to fill a five-year position in astronomy education research — watch this space for more news, as we bring the newest IAU office up to full speed!

5.3

The Office of Astronomy for Education (OAE)

Markus Pössel

OAE Director

Carolyn Liefke

OAE Deputy Director

5 IAU Offices

5.4

Remembering Norio Kaifu

**Hidehiko Agata
and Lina Canas**

National Astronomical
Observatory of Japan

In 2012, following on from the organisation of the UNESCO International Year of Astronomy 2009 (IYA2009), which reached out to over 800 million people from 148 countries, the IAU Office for Astronomy Outreach (OAO) was set up in Mitaka, Tokyo, Japan to implement the Beyond IYA2009 plan.

Norio Kaifu (IAU President 2012–2015 and Director General of the National Astronomical Observatory of Japan [NAOJ] 2000–2006), was passionate about astronomy outreach. Serving as the IYA2009 Single Point of Contact in Japan, his contributions were instrumental to the global success of this worldwide celebration of astronomy. Norio Kaifu played a key role in the creation of the OAO, as a joint venture between the IAU and the NAOJ.

The NAOJ is the national centre of astronomical research in Japan, with one of the most advanced observing facilities in the world. As an Inter-University Research Institute, the NAOJ promotes the open use of these facilities among researchers, as well as encouraging flexible international cooperation.

In its eight years of existence, the OAO has played an important role in fulfilling one key NAOJ mission goal: “to bring benefits to society through astronomy public outreach and to make research outcomes widely known to society”.

Since the inception of the OAO, the NAOJ has seen fruitful results from this collaboration, hosting the Communicating Astronomy with the Public 2018 meeting in Fukuoka — the largest and most diverse such meeting to date with 460 participants from 53 countries, organising the first IAU symposium on diversity and inclusion in astronomy, and playing a key role in coordinating one of the largest international outreach networks in 131 countries.

As we signal a year since Norio Kaifu’s passing on 13 April 2019, both the IAU and the NAOJ are committed to keeping his legacy alive and, through the OAO, will continue to impact astronomy outreach worldwide, through access, communication and international collaboration.

The International School for Young Astronomers (ISYA) has enrolled 1484 alumni over its 52-year lifespan. The three-week-long intensive ISYAs mainly target countries where astronomy is not fully developed, as well as isolated graduate students around the globe. The reports of all 42 schools organised to date are available online on the IAU/ISYA webpage¹.

We have extracted the names of alumni from these reports and created a database. The country assigned to each of the alumni is that of the current sovereign state of their home institute, not necessarily their country of origin. Alumni are counted only once, even if they attended several ISYAs. Those from former republics of Czechoslovakia, Yugoslavia and USSR are assigned the current sovereign states of their institutes at the time they attended the school, whenever this information is available. For those without that information, we adopt the former capital city to assign a tentative country.

The countries with the greatest number of alumni (> 40: Argentina, Brazil, China, Egypt, Greece, India, Indonesia, Iran, Nigeria, Thailand and Spain) are those that have hosted most schools. The exceptions are Greece and Spain, which hosted one school each in the 1970s, with uncharacteristically large number of students. Currently ISYAs accept about 30–50 students, with at least half of the students coming from outside the host country.

The map includes areas that were targeted by the programme in the past, but that are now considered as astronomically developed countries. In grey and light yellow, we find countries still needing to develop larger astronomy communities, from where we would like to increase recruitments. So far, we have enrolled students from 93 countries, and this number keeps increasing. For example, for the ISYA organised in 2019 in China we had, for the first time, alumni from Bangladesh, Mongolia and Myanmar.

We would like to keep improving the ISYA historical database. If you are a graduate of an ISYA, we would like to update your information. Please send an email to isya@iau.org includ-

5.5

The ISYA family

Itziar Aretxaga

INAOE, Mexico

ISYA Director

Jowita Borowska

Univ. Oslo, Norway

OYA summer intern

Michele Gerbaldi

IAP, France

Chair of OYA

Steering Committee

David Mota

Univ. Oslo, Norway

ISYA Deputy Director

5 IAU Offices

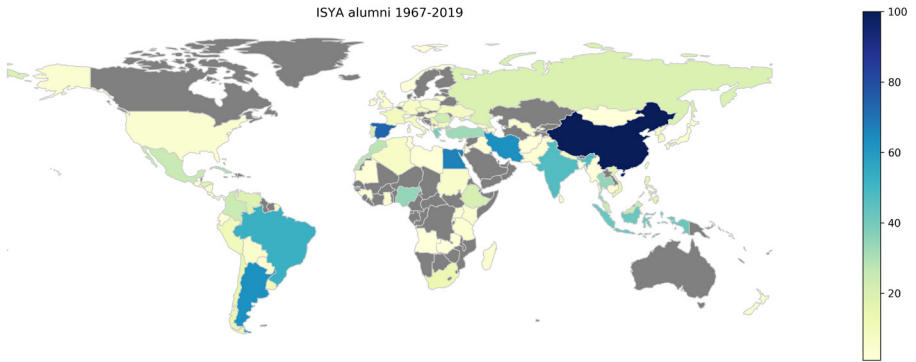


Figure 7: Distribution of 1459 alumni with location information in the database, coming from 93 countries. Boundaries are as defined by sovereign states in 'Natural Earth'². Source: OYA.

ing these fields: name, surname, gender, current e-mail, ISYA school(s) you attended, citizenship at the time you attended the school, year in which you completed your BSc, MSc and PhD (where applicable), your current position or occupation, and any other information you would like to add.

Notes

¹ https://www.iau.org/education/school_for_young_astronomers/list/

² <https://www.naturalearthdata.com/>

Advances in astronomy, space science and technology contribute to the economic growth and development of any country, but especially stimulate the research and technological advancement of developing countries. Importantly, the Ethiopian astronomy and space programme has brought significant paradigm shifts in capacity building, research, technology development and transfer, and human knowledge. It has led to major technological developments with universal benefits underpinning economic and social progress in our community. Today, Ethiopia is one of a few countries with a national space policy and strategy that addresses clearly the importance of astronomy and space technology. Ethiopia, recognises the development of a national astronomy and space programme as an important strategic choice for achieving national development agendas and improving the well-being of humankind. Given the geography, topography, weather conditions, astronomical cultures, geopolitics and socio-economic context of Ethiopia, astronomy and space are together a matter of high importance in terms of national sovereignty, capacity building, knowledge and technology transfer and universal development.

The Ethiopian Space Science and Technology Institute is the national government organisation established to lead and coordinate the astronomy and space programme in respect of capacity building, research, infrastructure development, national coordination and international relations. Currently Ethiopia is working to become a hub of astronomy and space technology in East Africa.

In 2015 two 1-metre telescopes were commissioned at Entoto Observatory and Research Center, which has attracted many astronomers and is considered as the birthplace of astronomy and space in East Africa. Presently more than 20 Masters and 15 PhD students are working on their research, more than 90 papers have been published and a number of observational activities are under way.

6.1

Recent Development of Astronomy in Ethiopia

Solomon Belay

Tessema PhD

Associate Professor
of Astrophysics and
Director General of
Ethiopia Space Science
and Technology Institute
(ESSTI), P.O.Box 33679,
Addis Ababa, Ethiopia

6.2

The Dark & Quiet Skies: Science and Society Conference — An Update

Constance Walker
Chair of Executive
Committee Working
Group Dark and Quiet
Sky Protection

The United Nations Office for Outer Space Affairs and the Government of Spain are arranging a meeting entitled Dark and Quiet Skies for Science and Society, proposed by the International Astronomical Union. The meeting, on 6–9 October, will be hosted by the Instituto de Astrofísica de Canarias. It will be held as an online webinar or, if COVID-19 travel restrictions are lifted, as an in-person meeting in Santa Cruz de La Palma, Canary Islands, Spain. A decision will be made in July.

The purpose of the conference is to achieve an international agreement on the protection of the astronomical sky. The resulting document will describe measures governments and private enterprises can adopt to mitigate negative impacts on astronomy of technological developments (e.g., urban lighting, radio interference and large satellite constellations), without diminishing the effectiveness of services they offer. The impact on human health, wildlife and dark sky places will also be included and solutions sought. The final document will be presented to the UN's Committee on the Peaceful Uses of Outer Space for approval, to become a reference for regular future analysis of changing situations.

With the introduction of large satellite constellations, it is a good time for the astronomical field to come together. By examining results from the latest observations, the simulations and mitigation testing that astronomers and at least one satellite company have done and converging on solutions that can reasonably be taken forward by both satellite companies and the astronomical community, the next steps can be identified. One way to do this is to establish working groups that focus on the main conference topics in advance and present and discuss them at the meeting along with invited talks. Then drafts are revised and combined to produce the final document.

We hope you can join us. More information, including registration details, can be found on this website.

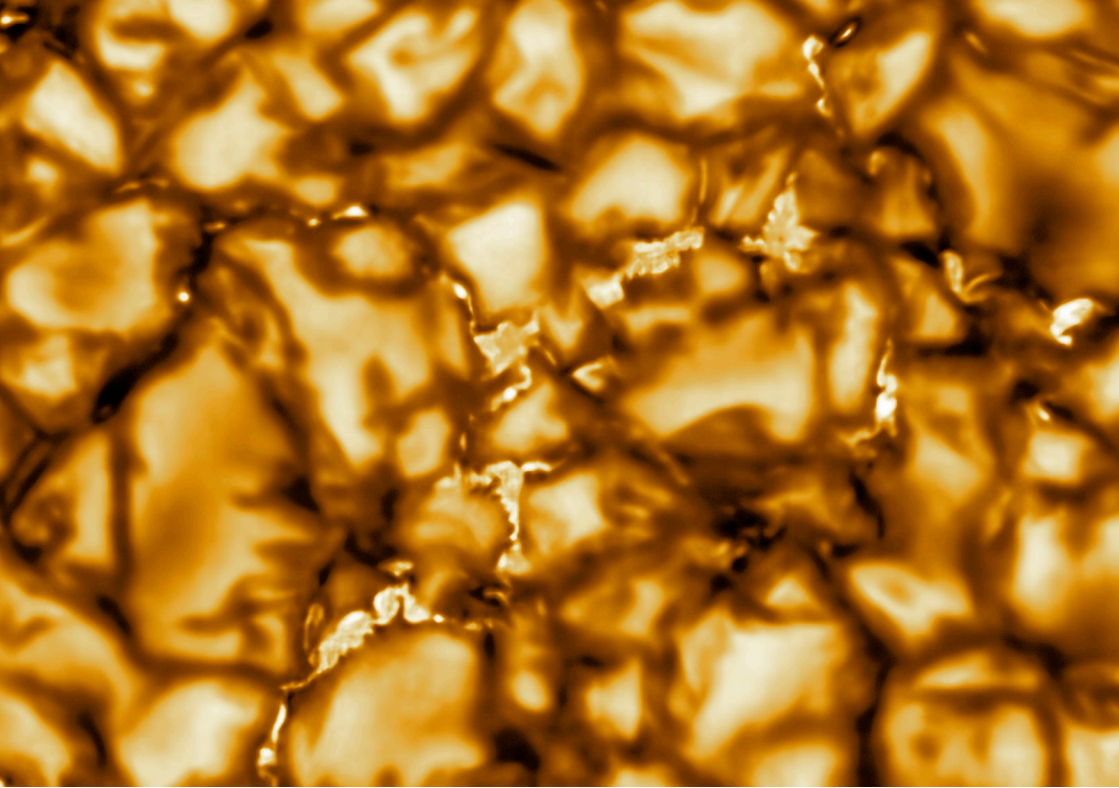


Figure 8: The first images from the National Science Foundation's Daniel K. Inoué Solar Telescope were released on January 29th, 2020. The images reveal unprecedented detail of the Sun's surface and preview the world-class products to come from this preeminent 4-meter solar telescope. The Inoué Solar Telescope, on the summit of Haleakala, Maui, in Hawai'i, will enable a new era of solar science and a leap forward in understanding the Sun and its impacts on our planet. Credit: NSO/NSF/AURA

IAU Publications
since December
2019

IAUS 342 - IAU Symposia

Perseus in Sicily: From Black Hole to Cluster Outskirts¹

14–18 May 2018, Noto, Italy

Eds. Asada, A.; De Gouveia Dal Pino,
E.; Giroletti, M.; Nagai, H.; Nemmen, R.

Cambridge University Press

ISSN 1743-9213

13 Apr 2020

**IAUS 346 - High-mass X-ray Binaries: Illuminating the
Passage from Massive Binaries to Merging Compact
Objects²**

August 2018, Vienna, Austria.

Eds. Oskinova, L. M.; Bozzo, E.; Bulik, T.; Douglas, R. G.

Cambridge University Press

ISSN 1743-9213

3 Jan 2020

IAU Focus Meetings

IAU Astronomy in Focus XXX³

Vienna, 20–31 August 2018

Ed. Maria Teresa Lago

Cambridge University Press

ISSN 1743-9213

8 Apr 2020

Annual Division Reports (2019)⁴

Annual Commission Reports (2019)⁵

Annual Working Group Reports (2019)⁶

IAU News

We welcome submissions for newsworthy IAU developments to be considered for IAU Press Releases and Announcements. News is defined as any important development in the Union that ought to be communicated to a wider audience beyond the scope of just one of the Scientific Bodies. It is also a

means of communication not only about astronomy but also between astronomers.

Links

¹ <https://www.cambridge.org/core/journals/proceedings-of-the-international-astronomical-union/issue/perseus-in-sicily-from-black-hole-to-cluster-outskirts/110B11CE66114FB5D618B4091979CE8A>

² <https://www.cambridge.org/core/journals/proceedings-of-the-international-astronomical-union/issue/BFF3E2C2AAE1AB336A70B1D29AC97A61>

³ <https://www.cambridge.org/core/journals/proceedings-of-the-international-astronomical-union/iau-astronomy-in-focus-xxx>

⁴ https://www.iau.org/publications/iau/division_reports/

⁵ https://www.iau.org/publications/iau/commission_reports/

⁶ https://www.iau.org/publications/iau/wg_reports/

⁷ IAU Newsletters: <https://www.iau.org/publications/e-newsletters/>

⁸ IAU Press Releases and Announcements References:

<https://www.iau.org/news/pressreleases/>

<https://www.iau.org/news/announcements>

8

Cooperation with other Unions and Organisations

8.1

**The Royal
Astronomical Society:
Two hundred years
old in 2020**

Michael Cruise
President of the Royal
Astronomical Society

In January 1820 a group of amateur astronomers met in a London pub and over dinner decided to form the Astronomical Society of London. In 1831 the name changed to The Royal Astronomical Society, now known simply as the RAS. As a society with royal patronage, the RAS was successively given accommodation in various government buildings, ending up in 1874 in the specially built suite of rooms at the Royal Academy, Burlington House, in Piccadilly, London.

From this distant origin the RAS has evolved into a modern society, serving its 4000 members by publishing scientific journals, awarding medals, giving career support and speaking to government on policy issues affecting astronomy and geophysics.

The Society is entirely self supporting financially, deriving its income from investments, publishing and membership fees, and this allows it to retain complete independence in its policy and activities.

The RAS holds meetings on the second Friday of each month from October to May, when specialist discussions take place at Burlington House, one on an astronomical topic and one on a topic in geophysics. Following a break in the afternoon an "Open Meeting" is held at which talks are given from across the science remit of the RAS. These are an important means of providing broader discussions on developing science topics compared to the very focused specialist meetings.

Bicentenary celebrations in 2020 include RAS200: a programme of activities with sectors of the community not normally involved in science such as carers, minority language speakers, prisoners and football fans. Dinners to mark the origins of the Society, podcasts involving young members and a series of open meetings spanning the broad science range of the Society, have all been planned to launch the RAS into an active future, hopefully for another 200 years.

- On 1 September abstracts and submission opens for the General Assembly (submitters are automatically pre-registered for the GA at the early-bird rate).
- On 15 September National Members are invited to submit candidatures for Honorary Members, a new type of membership which began at the last GA in 2018.
- 15 September is also the deadline for submission of Letters of Intent (LOIs) for 2022 Symposia.
- On 30 September the Letters of Intent (LOIs) will be published for the Symposia proposals for 2022.
- 1 October marks the opening of the annual membership application process. This is open to both Individual and Junior Member applications.
- 1 November is the deadline for Letters of Intent (LOIs) to host the IAU General Assembly in 2027. These letters should be sent directly to the IAU General Secretary.
- 15 November is the deadline for submission to the General Secretary of motions to amend the Statutes and Bye-laws. This is also the deadline for the submission of Resolutions with financial implications.
- 15 December hosts several important deadlines, especially as this is the end of the year leading up to the General Assembly.
 - Deadline for the draft budget to be distributed by the Executive Committee to the National Members;
 - Deadline for submission of full proposals for 2022 Symposia;
 - Deadline for applications for National Membership;
 - Deadline for nominations for the Gruber Foundation Cosmology Prize and
 - Deadline for the IAU PhD Prize application submission.
- 16 December: Both the IAU PhD Prize and the Gruber Foundation Cosmology Prize nominations open for 2020.

Reference for upcoming Administrative Dates and Deadlines:
<https://www.iau.org/administration/events/future/list/1/>

9.1

Important events
coming up in the
next six months
within the IAU



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Cover; This panorama image shows, what observing astronomers at the ESO observatories do, when they make a short break during their night shift: They watch the night sky with their naked eye, still fascinated by the wonders of the cosmos. Credit: R. Wesson/ESO

