IAU COMMISSION C3 NEWSLETTER

HISTORY OF ASTRONOMY

Welcome to the first newsletter of IAU Commission C3 (History of Astronomy). This issue is jam-packed with progress reports of our Commission, Working Groups, and Project Groups since the Vienna General Assembly. It contains announcements of upcoming conferences and reports of those that have recently taken place. There is a list of notable publications suggested by Commission members and tables of content from several journals devoted to the history of astronomy. In these pages, you will find news from members, announcements of awards, and obituaries.

These have been very unsettling times. The pandemic of the novel coronavirus, COVID-19, has touched us all. Many of us are locked out of our research institutions and have been sheltering in place in our homes. It is a scary time. We fear that family, friends, and colleagues will be stricken with the awful virus. This virus knows no borders. It has shown the world what we astronomers have long known: We are all under one sky.

We hope this simple newsletter will entertain and inform you in these troubled days. We are a very busy Commission! The next issue of the newsletter will be in December 2020. Please send our Secretary any news you would like us to include.

Wayne Orchiston
Christiaan Sterken
Sara Schechner
Executive Committee

NEWSLETTER EDITOR

Sara Schechner schechn@fas.harvard.edu

Please email submissions, reports, and news for the next newsletter by November 15, 2020.

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COMMISSION AND WORKING GROUP REPORTS

The C3 Organising Committee for 2018–2021

Wayne Orchiston (President)

The following Organising Committee was elected for the 2018–2021 Triennium:

President: Wayne Orchiston (Australia; wayne.orchiston@gmail.com)
Vice-President: Christiaan Sterken (Belgium; csterken@vub.ac.be)
Committee Members:
Ileana Chinicci (Italy)
Eun-Hee Lee (South Korea)
Jay Pasachoff (USA)
Sara Schechner (USA)
Pieter van der Kruit (Netherlands)
Advisor (Immediate Past President): Xiaochun Sun (China)

Subsequently, Sara Schechner (schechn@fas.harvard.edu) was appointed Secretary of the Commission for the triennium. Biodata on all of the current OC members will be published in the December Newsletter.

Actually, the 2018 election of the OC was a momentous affair with 4 candidates standing for Vice-President and a record 16 candidates standing for the five available Committee Member positions. After the wholesale disruption caused by the IAU restructuring in 2015, I suspect that we all had high hopes for the future and that C3 would one day emulate the vibrancy and success that its predecessor (C41) achieved back in what I prefer to call "the good old days," before the restructuring.

I want to thank all those who stood for the OC. Realising that many excellent candidates were bound to miss out during the election, we hoped to introduce changes within C3 that would allow most of these people to play an active role in the future development of the Commission. For various reasons, mainly beyond our control, this has not proved entirely possible—something that I greatly regret. Further information is provided in the "Progress Report" that appears later in this Newsletter.

Finally, I want to thank the inaugural C3 OC, led by Xiaochun Sun, for guiding the Commission during the heady days after the 2015 restructuring, and especially out-going members David Valls-Gabaud (France), Owen Gingerich (USA) and Raymond P. Norris (Australia). Undoubtedly, the greatest achievement of the inaugural C3 OC was to help plan the Centennial Symposium (IAUS349), which for many astronomers was one of the highlights of the Vienna General Assembly.

IAU Commission C3 Progress Report

Wayne Orchiston (President)

On 2 August 2018 the new Organizing Committee (OC) of IAU Commission C3 (History of Astronomy) held a 30-minute Business Meeting at the Vienna IAU General Assembly, where we summarized plans for the new Triennium. There were ten items that we particularly wanted to discuss:

1. Collaboration with Commission C4 (World Heritage and Astronomy)
2. Website
3. Commission C3 Newsletter
4. Working Groups
5. Project Groups
6. Conferences and Workshops
7. 2021 IAU General Assembly in Busan (South Korea)
8. Publication Opportunities
9. Membership
10. Status of the Inter-Union Commission of History of Astronomy

Progress to date on all of these are discussed below.

1. Collaboration with Commission C4

IAU Commission C4 (World Heritage and Astronomy) began life as a very active Working Group of our C3 predecessor, Commission 41 (History of Astronomy), and became an independent Commission in its own right during the 2015 IAU restructuring. In recognition of our shared interests, C3 tries to collaborate with C4 whenever possible, but C4 has its own agenda that does not always include C3.

2. Website

Before the restructuring, our commission had its own website (http://historyofastronomy.org/). Since then, we have gotten conflicting messages from the IAU about Commission websites. While some Commissions and Working Groups maintain their own, we are also told that all Commission material should be hosted on the relevant Division's website. C3 is one of four Commissions in Division C (Education, Outreach and Heritage). Apart from C4 (World Heritage and Astronomy), the other two Commissions--C1 (Astronomy Education and Development) and C2 (Communicating Astronomy with the Public)--relate to education. Thus far we have made no progress in establishing our own external website or getting our material onto the Divisional website (which is still being developed). Recently we learned from the IAU Secretariat that we have been assigned this site to populate: (https://www.iau.org/science/scientific_bodies/commissions/C3/info/).

3. Commission C3 Newsletter

C41 used to issue a popular newsletter, but under the new IAU structure we have been informed that all of our communication with C3 members is supposed to be via the Divisional newsletter. However, this does not appear regularly, and it certainly does not allow us to provide the range of information that our members require—which is why we have finally resorted to this newsletter that you now are reading.

4. Working Groups (WGs)

From the onset we were fore-warned that it would be difficult to form C3 Working Groups (WGs), notwithstanding the undoubted success of most of the WGs maintained by C41 in the pre-restructuring era (which was clearly documented in a paper I presented at the Vienna General Assembly (see Figure 1) that subsequently was published in the *Proceedings of the Centennial Symposium*—if you want a copy, email me at wayne.orchiston@gmail.com).

Figure 1. The title slide of my IAU paper about C41 Working Groups.

This indeed proved to be the case and it took one and a half years (half of our triennium term!) of teleconferenced meetings and email exchanges before all of the Division C WGs were finalized. In the process we lost our Johannes Kepler WG, but eventually managed to retain the Archaeoastronomy and Cultural Astronomy WG and the Ethnoastronomy and Intangible Heritage WG (both of which are now shared with C4 *and* C1). Our attempt to collaborate with C4 by joining its Working Group 'Windows to the Universe: Classical and Modern Observatories' was unsuccessful (even though those of us involved over many years in the C41 'Historical Instruments' WG had always included observatories and proposed to repackage this as 'Historical Instruments and Observatories' jointly with C4). This was particularly unfortunate. And eventually, we did manage to get the joint IAU-URSI WG on Historical Radio Astronomy approved as a joint IAU WG of B4 (Radio Astronomy) and C3. This was in line with the original intention. When I formed this WG in 2003 it was a joint initiative of C40 (Radio Astronomy) and C41 (History of Astronomy), and it went on to become one of the most successful WGs in the whole IAU.

I should disclose that originally C3 also planned to form WGs on Astronomical Archives, Arabic and Islamic Astronomy (see Figure 2), Asian Astronomy, and Applied Historical Astronomy, but given the battle we encountered just to form the aforementioned C3 WGs and our inability to collaborate with C4 on Historical Instruments and Observatories, we chose not to proceed with any of these. Personally, I think this is a great pity, as all are needed by the international history of astronomy community.

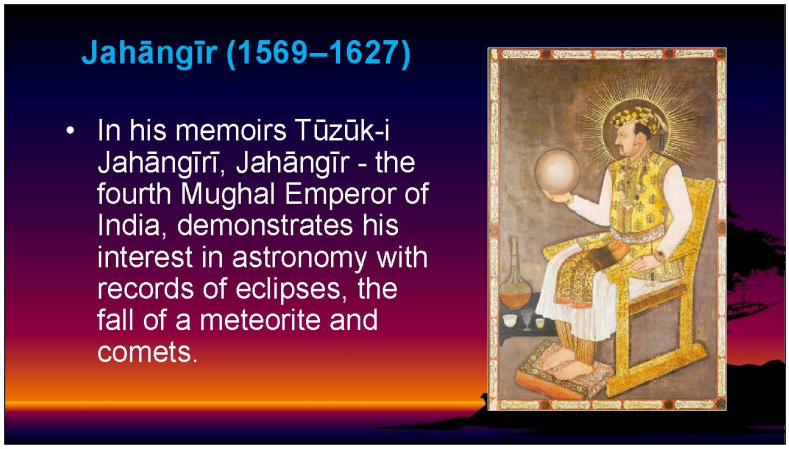

Figure 2. One of the slides in Ramesh Kapoor's paper on Islamic Astronomy in India presented at the Vienna IAU General Assembly.

5. Project Groups

In order to facilitate research projects and international collaborations at a Commission level we also proposed the formation of small-scale Project Groups (PGs) that would be set up and run unilaterally by C3. When it became obvious we would have problems in setting up all of the WGs we wanted, we foreshadowed the formation of two PGs, on the 1868 Total Solar Eclipse (chaired by myself: wayne.orchiston@gmail.com) and on Indian and SE Asian Astronomical Stone Inscriptions (chaired by B.S. Shylaja from India: shylaja.jnp@gmail.com). Both of these were formed and are active. The Solar Eclipse PG relates specifically to a book about this particular eclipse that will be published by Springer late in 2020 or early 2021 (see Figure 3), while the Stone Inscriptions PG is being actively promoted through the History & Heritage WG of the SE Asian Astronomy Network and the International Conference on Oriental Astronomy (ICOA) series of Asian Astronomy conferences. This is where effective networking between C3 and other formal astronomical groups is so important. If you are interested in the latter PG please contact Dr Shylaja—she will be happy to hear from you.

Given the outcome of our attempts to form C3 WGs, we also decided to form a Johannes Kepler PG, so that this former C3 WG can continue its work, which is primarily to complete a book on Kepler that Springer will publish in 2021. For further information on this PG contact the chair, Terry Mahoney (tjm@iac.es).

We also decided to form an Astronomical Archives PG (chaired by Ileana Chinnici), to further the work of the earlier C41 Archives WG; an Historical Instruments and Observatories PG (chaired by Sara Schechner), to also continue and develop the work of our earlier C41 WG; and a PG on Asian Astronomy (see Figure 4), to promote collaborative research in this region of the world (chaired by me). If you are

interested in joining any of these please email Ileana (ileana.chinnici@inaf.it), Sara (schechn@fas.harvard.edu) or me (wayne.orchiston@gmail.com).

We are also pleased to announce the formation of the Biographical Encyclopedia of Astronomy III PG. It will be chaired by Tom Hockey and co-chaired by Jennifer Bartlett. Its mission will be to assist the editors in preparing an improved third edition of the BEA. More details will be forthcoming soon along with an invitation to join the BEAIII PG.

C3 is now in the process of discussing the formation of further PGs, and we welcome your feedback on which ones you think will be most useful.

Figure 3. The Janssen-Lockyer Medal showing the profiles of the two scientists and Apollo's chariot passing in front of the Sun—from Francoise Launay's chapter about Janssen in the 1868 solar eclipse book.

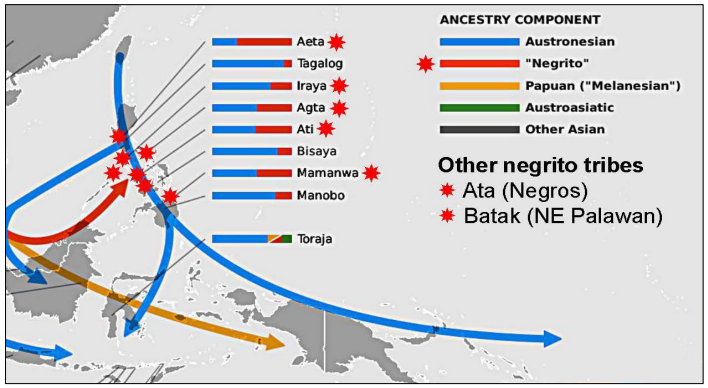

Figure 4. Comparing and contrasting the astronomical systems of the negrito ethnic groups of the Philippines (shown here by red asterisks) and other SE Asian negrito populations is just one of the many exciting research projects awaiting ethnoastronomers. This map combines information drawn from anthropology, prehistory, linguistics and mitochondrial DNA studies. (map modifications: Wayne Orchiston)

6. Conferences and Workshops

Organising our own C3 Conferences and Workshops is notoriously difficult given the politics of the IAU and the fact that we do not always have support even from within our own Division, so where possible we aim to network with other institutions and support or co-sponsor their conferences and workshops. Thus far, the following collaborations have been arranged:

- Silk Road Workshop: October 2018, Beijing, China
- '2020H&H', the third meeting of the History and Heritage Working Group of the SE Asian Astronomy Network: SE Asian History of Astronomy Conference, Chiang Mai, Thailand, 3–5 February 2020 (see Figure 5)
- International Ethnoastronomy Training Workshop: scheduled for March 2020 in the Philippines; now postposed to later in 2020 due to the COVID-19 outbreak
- 'Living Skies/Cielos Vivos' (Oxford XII, ISAAC): scheduled for April 2020 in La Plata, Argentina; now postposed to 2021 or 2023 due to the COVID-19 outbreak
- 'Gerbertus 2020: The Moon of Gerbert': ICRANet Coordinating Center, Pescara, Italy, 5 May 2020

- 'ICOA-10': Tenth International Conference on Oriental Astronomy, Jeju Island, South Korea, 19–23 June 2020
- 'Astrophysics in the Light of History': Vatican Observatory workshop, 28 September–3 October 2020
- 'The History of Astronomy and Astronomy Education in Africa': Cape Town, South Africa, 29–23 October 2020

A report on the 2020H&H Conference and an announcement about the ICOA-10 Conference appear elsewhere in this Newsletter.

We are always happy to hear about other conferences or workshops that C3 can be involved in. If you wish to suggest one (or more), please email me (wayne.orchiston@gmail.com).

7. The 2021 IAU General Assembly in Busan (South Korea)

We have applied to run two Focus Meetings at the Busan GA, one as a stand-alone C3 venture and the other in collaboration with C4. The first is about the early history of astrophysics, and the second is about Asian history of astronomy research prospects and the IAU-UNESCO Astronomy Heritage initiative. We will let you know the outcome of these in due course.

In addition there will be the mandatory C3 meeting assigned within the Division C program, and—as in Vienna—we also will seek to run our own specialist Science and Working Group Meetings on a range of different topics relevant to the research themes of our members. We had a tremendous fight to get these programs approved for the Vienna General Assembly, and hope we will have more success with Busan. We will keep you all posted. We realise that the only way we can attract our members to South Korea in August 2021 is if we can offer a raft of meetings that cater for all research tastes, and justify the financial outlay—especially if we do not score a Focus Meeting.

8. Publication Opportunities

Apart from the *Journal for the History of Astronomy (JHA)* and the *Journal of Astronomical History and Heritage (JAHH)*, C3 members should know that Springer has launched a new book series on Historical and Cultural Astronomy (HCA), suitable for those wishing to publish well-researched academic books in the history of astronomy area (including archaeoastronomy and ethnoastronomy). I am one of the three co-editors of this series and can provide further details (wayne.orchiston@gmail.com), otherwise feel free to contact the Springer History of Astronomy 'Gate-keeper' Hannah Kaufman (Hannah.Kaufman@springernature.com). Photographs of the covers of some recent books in the HCA Series are shown in Figure 6).

Speaking of *JHA* and *JAHH*, the contents of recent issues are listed elsewhere in this Newsletter. Details of both journals are available on their websites, or by contacting their respective Editors, Professor James Evans (jcevans@pudgetsound.edu) and me (wayne.orchiston@gmail.com).

Many C3 members have sent us news of notable publications. Our Secretary, Sara Schechner, has compiled them into a list in this newsletter. If you have a publication that you would like to be better known, please send information to Sara Schechner (schechn@fas.harvard.edu).

9. Membership

At the Vienna General Assembly, the Organizing Committee discussed the fact that after the 2015 IAU restructuring literally hundreds of former C41 members did not end up joining C3. Many thought this automatically had happened, and were surprised to find they were not C3 members when we or they checked. Consequently, we have been inviting former C41 IAU members to join C3, and thus far more than 50 have applied. This project is ongoing.

Now that the IAU accepts application for membership annually (instead of every three years), we have also started identifying research-active historians of astronomy with science or technology degrees who are not yet IAU members and encouraging them to apply for membership. We approached more than 50 such astronomers prior to the 2019 application deadline, and about half of them submitted applications (others simply forgot until it was too late). This also is an ongoing project, and further astronomers will be contacted prior to the December 2020 application deadline. Having said that, the National Committees of Astronomy in some countries do not look favourably at history-of-astronomy applicants, so we do not expect all of these we encourage to apply to be successful.

10. Status of the Inter-Union Commission of History of Astronomy

The IAU and the International Union of History and Philosophy of Science and Technology (IUHPST) have an Inter-Union Commission of History of Astronomy (ICHA). It is open to anyone working in the field of history of astronomy. Until the 2015 restructuring took place, IAU Commission C41 was the coordinator of the ICHA. The new C3 has now been approved in this role by the IUHPST, and we are in the process of formalizing arrangements with the IAU.

Similar to the IAU's General Assemblies, the IUHPST holds an International Congress of History of Science and Technology, but every four years. And unlike the IAU, the IUHPST requires *every* Commission to run one or more Symposia! This is very different from the IAU situation where the limited GA meeting slots are hotly contested, and C3 is usually marginalised by the combined might of the astrophysics commissions. Consequently, ICHA is expected to organize one or more symposia at the upcoming 26th International Congress of History of Science and Technology, which will be held between 25 and 31 July 2021 in Prague, the capital of the Czech Republic.

As managers of ICHA, the leadership of C3 has made arrangements to co-sponsor a Symposium in Prague with the IUHPST's Commission on the History of Ancient and Medieval Astronomy (CHAMA). This Symposium will be on "Art, Image, and Astronomical Knowledge," and will have five sessions of four papers each. More details are given in the Upcoming Meetings section of this newsletter. For those who can't easily get to South Korea (especially if we don't score a Focus Meeting), Prague offers an exciting alternative just one month before the IAU General Assembly.

SEAAN HISTORY AND HERITAGE WORKING GROUP

"2020H&H: EXPLORING THE HISTORY OF SE ASIAN ASTRONOMY"

(Dedicated to the memory of Dr Yukio Ôhashi, who died suddenly at the end of October 2019)

CIRCULAR #3 (immediate action items are highlighted in blue)
(New information in green print)

1 DATE

The SEANN 2020H&H Meeting will be held in Chiang Mai, Thailand, on Monday & Tuesday 3–4 February 2020, with an optional two-part field trip on Wednesday 5 February.

2 WEB SITE

http://www.narit.or.th/en/index.php/shh2020

3 HOSTS/SPONSORS

National Astronomical Research Institute of Thailand (Chiang Mai)
IAU Commission C3 (History of Astronomy)

4 VENUE FOR THE 2020H&H MEETING

Lotus Pang Suan Kaew Hotel
21 Huay Kaew Road
Chiang Mai 50200
Thailand
Phone: +66 (0) 53 22 4333
Fax: +66 (0) 53 22 4493

5 THEMES

- Recent research on mainstream areas of SE Asian astronomical history
- Recent research on ethnoastronomy and archaeoastronomy
- The impact of India and China on SE Asian astronomical history

6 SCIENTIFIC ORGANISING COMMITTEE (* = coming to 2020H&H)

*Professor Wayne Orchiston (Thailand – Co-Chair)
*Professor Boonrucksar Soonthornthum (Thailand – Co-Chair)
*Mr Visanu Euarchukiati (Thailand)
*Dr Lars Gislén (Sweden)
*Associate-Professor Ryan Guido (Philippines)
Associate-Professor Duane Hamacher (Australia)
Professor Bambang Hidayat (Indonesia)
*Professor Taufiq Hidayat (Indonesia)
*Ms Nurul Fatini Jaafar (Malaysia)
*Dr Roger Kinns (Scotland)
*Associate-Professor Lê Thành Lân (Vietnam)
Professor Akira Okazaki (Japan)
*Dr B.S. Shylaja (India)
*Professor Jesus Torres (Philippines)
Professor Mayank Vahia (India)

7 TARGET AUDIENCE

Professional astronomers, university staff, graduate students with an interest in SE Asian astronomical history, amateur astronomers, and interested members of the general public.

Figure 5. The first page of the 6-page Circular #3 about the 2020H&H Conference. Half of the SOC are C3 members.

Figure 6. Examples of some of the recent books in Springer's Historical and Cultural Astronomy Series. Initially a standardized cover was used for each volume, but later this was replaced by dedicated covers specific to each book.

IAU Division C Inter-Commission C1-C3-C4
Working Group for Archaeoastronomy and Astronomy in Culture
Annual Report for 2019

Steven Gullberg (Chair)
Javier Mejuto (Co-chair)

Working Group Members (49 including Chair and Co-chair)

Elio Antonello, G.S.D. Babu, Ennio Badolati, Juan Belmonte, Kai Cai, Brenda Corbin, Milan Dimitrijevic, Marta Folgueira, Jesus Galindo-Trejo, Alejandro Gangui, Beatriz García, César González-García, Duane Hamacher, Abraham Hayli, Dieter Herrmann, Bambang Hidayat, Thomas Hockey, Susanne Hoffmann, Jarita Holbrook, Andrew Hopkins, Matthaios Katsanikas, Ed Krupp, William Liller, Ioannis Liritzis, Alejandro Lopez, Claudio Mallamaci, Kim Malville, Areg Mickaelian, Gene Milone, Simon Mitton, Ray Norris, Wayne Orchiston, Robert Preston, Rosa Ros, Clive Ruggles, Irakli Simonia, Magda Stavinschi, Christiaan Sterken, Linda Strubbe, Woody Sullivan, Virginia Trimble, Ana Ulla, Johnson Urama, David Valls-Gabaud, Iryna Vavilova, Tiziana Venturi, Gudrun Wolfschmidt

Working Group Associates (32)

Bryan Bates, Patricio Bustamante, Nick Campion, Brian Davis, Margaret Davis, Sona Farmanyan, Roz Frank, Bob Fuller, Rita Gautschy, Cecilia Gomez, Akira Goto, Liz Henty, Stan Iwaniszewski, Olaf Kretzer, Trevor Leaman, Flavia Lima, Armando Mudrik, Andy Munro, Greg Munson, Cristina Negru, David Pankenier, Fabio Silva, Emilia Pasztor, Manuel Pérez-Gutiérrez, Michael Rappenglück, Eduardo Rodas, Bill Romain, Ivan Šprajc, Doris Vickers, Alex Wolf, Mariusz Ziółkowski, Georg Zotti

1 Objectives

The IAU Working Group for Archaeoastronomy and Astronomy in Culture (WGAAC) continues from the 2015-2018 triennium and is in part a discussion and collaboration group for researchers in *Archaeoastronomy* and all aspects of *Astronomy in Culture*, and as well for others with interest in these areas. A primary motivation is to facilitate interactions between researchers, but the WG also has significant interest in promoting education regarding astronomy in culture in all respects. It is the focal point within the IAU for both vigorous research in the field of *Astronomy in Culture* and in educating the public regarding examples of how cultural astronomy has been used in many societies. The WGAAC works to further the following objectives:

- Advance the field of archaeoastronomy
- Promote research and publication
- Promote strong initiatives for educators on different levels for multiple aspects of cultural astronomy to include the exploration of literature, poetry, music, films, etc.
- Promote public outreach to educate regarding astronomy in culture

- Use the fascination with astronomy in culture to inspire youth interest in pursuing any aspect of astronomy in their futures
- Increase the understanding of how astronomy was used in cultures within developing nations where such has not yet been fully explored
- Facilitate interactions with other members and groups within the IAU
- Facilitate interactions between researchers in the field
- Encourage engagement in this research by additional IAU members
- Promote collaboration between the IAU and International Society for Archaeoastronomy and Astronomy in Culture (ISAAC), Société Européenne Pour L'Astronomie Dans La Culture (SEAC), and Sociedad Interamericana de Astronomía en la Cultura (SIAC), Society for Cultural Astronomy in the American Southwest (SCAAS), and Società Italiana di Archeoastronomia, for the advancement of archaeoastronomy and astronomy in culture
- Promote the inclusion of archaeoastronomical research in other fields, such as Archaeology, Anthropology, Indigenous Studies, and Native American Studies, and further collaboration with these fields. Build rapport with organizations such as Society for American Archaeology (SAA), European Association of Archaeologists (EAA), American Anthropological Association (AAA), and Native American and Indigenous Studies Association (NAISA)

2 Collaborative, Research, and Educational Endeavors

As part of establishing these relationships, in 2019 information and papers were presented at events such as the following:

Society for Cultural Astronomy in the American Southwest – Flagstaff, Arizona
STARS 2019 – Havana, Cuba
Native American and Indigenous Studies Association – Hamilton, New Zealand
First International Congress on Astrophysics and Archaeoastronomy at UNSAAC – Cusco, Peru
European Association of Archaeologists – Bern, Switzerland
Protolang 6 – Lisbon, Portugal

The many members of the WGAAC actively perform rigorous research and publication.

In 2019 WGAAC members Steven Gullberg and Andy Munro finalized development of a new graduate education program for Archaeoastronomy and Astronomy in Culture at the University of Oklahoma in the United States.

3 WGAAC Committees

Since being reaffirmed for the 2018-2021 triennium, the WGAAC has organized five committees for members to further major initiatives:

Committee 1 - to develop a comprehensive book regarding a survey of astronomy in culture. This will be similar in concept to the IAU's "Big Ideas in Astronomy" and is to be posted/published on the IAU website and made readily available to the public.

Committee 2 - to develop initiatives for public outreach regarding astronomy in culture.

Committee 3 - to develop initiatives for educators and others regarding examples of cultural astronomy found in literature, poetry, music, films, etc. As part of our affiliation with Commission C1 we work to develop a robust compilation of such cultural information regarding this aspect of astronomy.

Committee 4 - to develop initiatives to gather knowledge regarding astronomy in culture in developing nations, especially where such has not yet been fully explored. Much has been learned about archaeoastronomy in many parts of the world, but there still are geographical gaps in the collective knowledge of the field.

Committee 5 - to develop initiatives for the advancement and promotion of strong cultural astronomy research, publication, and collaboration among scholars throughout the world. This also is meant to attract those in other fields (such as archaeology, anthropology, and Native American studies) who explore ancient culture and inspire them to include astronomy in their research and assessments.

The committee work is ongoing and will make important contributions to the growing field of *Astronomy in Culture*. The IAU through its WGAAC will be able to exert significant influence on its evolution.

4 Future

Work of the five committees continues in 2020.

An archaeoastronomy presentation was made in February at the BASIC 2020 astrophysics conference held on Long Island in the Bahamas. Additional opportunities to promote archaeoastronomy to different communities at conferences scheduled in 2020 are gradually being postponed or cancelled.

In January 2020 Steven Gullberg and Andy Munro launched the new graduate program for Archaeoastronomy and Astronomy in Culture at the University of Oklahoma.

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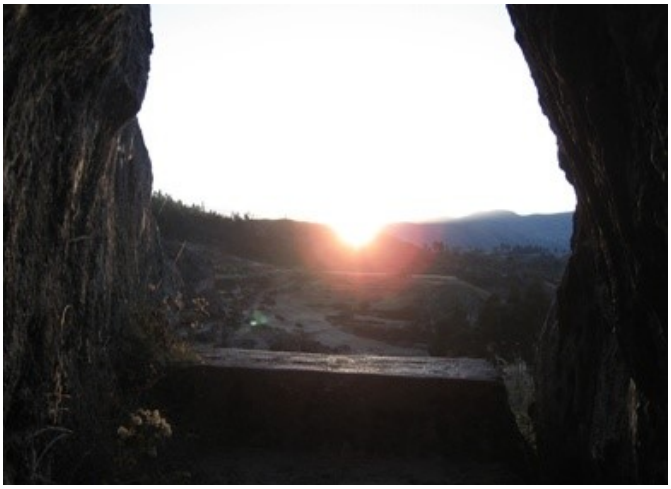

Figure 1. June solstice sunrise as seen from the northeast cave of Lacco located to the north of Cusco, Peru. The Sun advances each day from the right until reaching the central standstill depicted here, after which it reverses course and retreats daily to the right again. (photo Steve Gullberg)

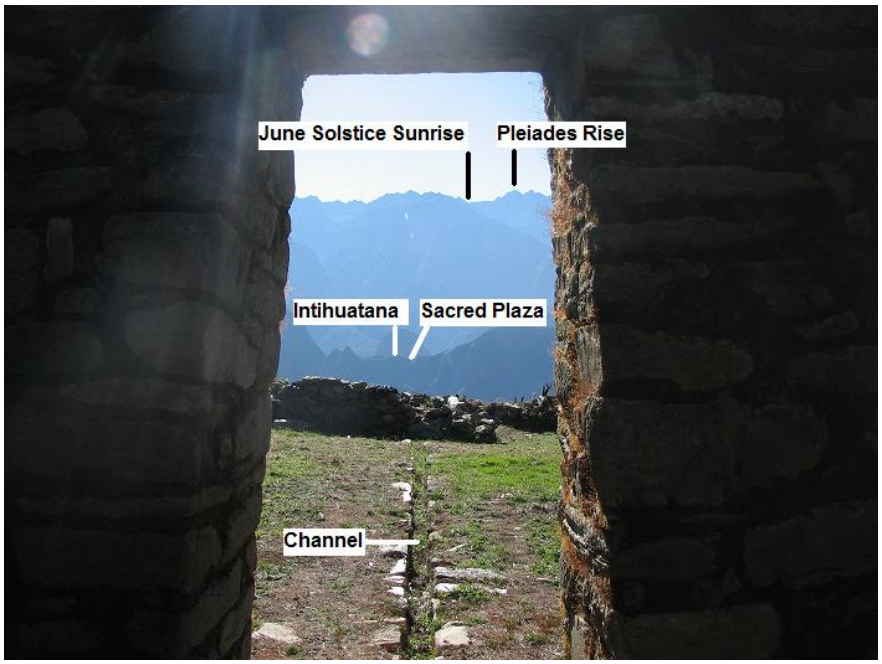

Figure 2. View from the primary door of the Llactapata Sun Temple - a stone-lined channel in the foreground points across the gorge to Machu Picchu's Sacred Plaza and the June Solstice Sunrise. (photo Steve Gullberg)

IAU Division C Inter-Commission C1-C3-C4

Working Group for Ethnoastronomy and Intangible Astronomical Heritage

Annual Report - 2019

Duane W. Hamacher (Chair)

Beatriz García, Alejandro Gangui, Steven Gullberg, Jarita Holbrook, Alejandro Martín-Lopez, Javier Mejuto, Wayne Orchiston, Clive Ruggles, and Mayank Vahia

1 THE VIENNA IAU GENERAL ASSEMBLY

At the 2018 IAU meeting in Vienna, the IAU C1-C4 WG on Intangible Astronomical Heritage became the WG on Ethnoastronomy & Intangible Heritage. The aim of this WG is to provide an avenue for recording, preserving, and safeguarding culturally specific Knowledge Systems and traditions related to astronomy. This includes intangible heritage, such as language, oral tradition, song, dance, and social customs relating to astronomy. The WG identified six (6) major areas regarding intangible heritage with respect to ethnoastronomy to be addressed:

1. Language
2. Oral Tradition (stories and narratives)
3. Music (including Song and Dance)
4. Knowledge Systems
5. Cultural Practices (such as navigation and ceremony)
6. Artistic Representation (all forms of art and craft, both tangible and intangible)

These form significant areas of focus within the WG and member expertise. Goals include UNESCO heritage recognition, preservation through government and regulatory bodies, and finding ways to preserve this, such as reducing light pollution, access to language and culture, education, and recoding (where appropriate and permissible) traditions such as story, song, and dance.

We also identified the following objectives for the 2018–2021 triennium, and beyond.

1.1 2020: Publish a Collaborative Journal Paper on Intangible Astronomical Heritage

This paper will outline the types, and importance of, Intangible Heritage (IH), the requirements and process for submitting heritage applications, how to protect IAH, provide a few case studies, and discuss actions and plans for the future.

1.2 2021: Populate the UNESCO Portal with Case Studies, and Mount a Social Media Campaign

We will identify six case studies (one for each category) to populate the UNESCO web portal and develop a way for related stakeholders to upload their own content for inclusion. We will engage in a social media

campaign to get our results and ideas out to the public. We will then explore the possibility of a documentary to be filmed on the subject.

1.3 2022: Host an International IAU-sponsored Meeting and Publish an Edited Volume

This meeting will focus on implementing the key issues laid out in the journal paper, including a number of case studies. We will seek status as a funded IAU Symposium, with an emphasis on input from Indigenous researchers and stakeholders. We will publish an edited volume similar to the one on *Tangible Heritage* published in 2010 (IAU Symposium, through Cambridge University Press). It will include in-depth case studies from a wide range of geographic and subject areas, with strong representation from Indigenous researchers and communities.

2 RECENT DEVELOPMENTS

2.1 IAU Name ExoWorlds Campaign

The IAU led a global effort for each participating country to contribute a name for an exoplanet and its host star. These included Indigenous, traditional, folk, and cultural names. WG members were heavily involved in this in their respective countries, including Argentina, Honduras, and Australia. This process demonstrated the need to recognise Indigenous language, knowledge, and intangible heritage.

In Argentina, García and Lopez lead the effort, in which members of Aboriginal communities were specially invited to participate in the contest and to propose meaningful names in their languages. The decision was made not to accept names in Aboriginal languages that were not proposed by speakers or members of the communities that speak those languages. Specific instructions were written, participation was stimulated through specific networks and proponents were helped to submit their proposals. Thanks to these actions, proposals were received from five different Aboriginal groups. One of the proposals, by Abel Salteño, teacher and Moqoit leader, was the winner. The successful names were *Nosaxa* (meaning "Spring") for the star and *Naqañ̃a* (meaning "brother") for the planet (HD 48265).

In Honduras, the process was led by Mejuto, which included the K'iche' Maya names. The successful names were *Hunahpú* (one of the twin gods who became the Sun) for the star and *Ixbalanqué* (one of the twin gods who became the Moon) for the planet (HD 98219). In Australia, Mount Burnett Observatory was responsible for managing the process (of which Hamacher was a committee member). The successful names were from the local Boon-wurrong people of southern Melbourne, being *Bubup* (meaning "child") for the star and *Yanyan* (meaning "boy") for the planet (HD 38283).

2.2 Exhibitions

IAU WG members are involved in current exhibitions that will pave the way for further development of the WG goals and pave the way for an IAU-sponsored Symposium. This includes the "One Sky, many Worlds", a travelling Indigenous Astronomy art and knowledge exhibition, to be launched in 2020 in Ottawa, Canada.

2.3 Research by IAU Members

Core research leading to WG outcomes has been published in a variety of academic journals and books and have been included in national curricula in member countries (such as Australia). These will be further developed for the case studies in the edited volume, as well as core content for the Symposium.

Examples in Australia include the following publication titles under each section (see Section 2.4):

- **Cultural Practices**: Death and Maier: meteors and mortuary rites in the eastern Torres Strait; Songlines and navigation in Wardaman and other Australian Aboriginal cultures
- **Music**: Dancing with the stars – Astronomy and Music in the Torres Strait
- **Ceremony**: Baiami and the Emu Chase: an astronomical interpretation of a Wiradjuri Dreaming associated with the Burbung
- **Knowledge Systems:** Observations of red-giant variable stars by Aboriginal Australians; Indigenous use of stellar scintillation to predict weather and seasonal change
- **Preserving Intangible Heritage**: Whitening the Sky: light pollution as a form of cultural genocide; Using Modern Technologies to Capture and Share Indigenous Astronomical Knowledge
- **Education**: Indigenous Astronomy in the Australian National Curriculum (https://indigenousknowledge.research.unimelb.edu.au/themes/astronomy)

These and other ethnoastronomical papers published in 2019 by members of the WG and others are listed below (with the names of WG members in bold print).

2.4 Recent Ethnoastronomy Publications by WG Members

Halkare, G., **Vahia, M.**, and **Orchiston, W.**, 2019. Astronomy of some Indian tribes. In Orchiston, W., Sule, A., and Vahia, M. (eds.), 2019. *Growth and Development of Astronomy and Astrophysics in India and the Asia-Pacific Region. Proceedings of the 9th International Conference on Oriental Astronomy*. New Delhi, Springer International Publisher. Pp. 423–431.

Halkare, G., Dahedar, P., **Orchiston, W.**, and **Vahia, M.N.**, 2019. Astronomy of the Pardhi tribe of Central India. *Journal of Astronomical History and Heritage*, 22, 179–194.

Hamacher, D.W., Barsa, J., Day, R., Passi, S., and Tapim, A., 2019. Indigenous use of stellar scintillation for predicting weather and seasonal change. *Proceedings of the Royal Society of Victoria*, 131(1), 24-33.

Hamacher, D.W., and Banks, K., 2019. The planets in Indigenous Australian traditions. In *Oxford Research Encyclopedia of Planetary Science*, edited by Peter Read. Oxford University Press (10.1093/acrefore/9780190647926.013.53).

Leaman, T.M., and **Hamacher, D.W.**, 2019. Baiami and the emu chase: an astronomical interpretation of a Wiradjuri Dreaming associated with the Burbung. *Journal of Astronomical History and Heritage*, 22(2), 243–255.

Orchiston, W., and Drummond, J., 2019. The Mount Tarawera volcanic eruption in New Zealand and Maori cometary astronomy. *Journal of Astronomical History and Heritage*, 22, 521–535.

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Figure 3. The Incas recognized "constellations" in dark regions of the Milky Way – the procession from right to left: (1) Machacuay the serpent, (2) Hanp'atu the toad, (3) Yutu the tinamou (a bird), (4) Yacana the mother llama, (5) Uñallamacha the baby llama, Atoq the fox, and (7) Yutu the second tinamou. (watercolor painting by Jessica Gullberg)

IAU-URSI Joint Working Group on Historical Radio Astronomy

Report

Richard Schilizzi (Chair)

WG Officers
Leonid Gurvits (Vice-Chair), Ken Kellermann (Secretary), Richard Schilizzi (Chair), and Richard Wielebinski (past-Chair)

Publications

1) A nearly complete list of all historical radio astronomy publications going back decades will be posted on the WG's website https://rahist.nrao.edu/. A subset of those publications from 2018 and 2019 is included below.

2) We are in the process of compiling past triennial reports from the radio astronomy commissions in IAU and URSI and will post them on the WG website.

3) We will endeavour to include a separate category on non-English publications as well. The English title of a publication in Russian is included in the list below.

4) Special note should be taken of the imminent publication by Springer of "Open Skies: The National Radio Astronomy Observatory and its Impact on US Radio Astronomy" by Ken Kellermann, Ellen Bouton and Sierra Brandt (see Fig. 6, p10).

Conferences

1) A well-attended conference on the History of the Square Kilometre Array, 1980's - 2012 was held at SKA Organisation headquarters at Jodrell Bank from 3-5 April 2019 (see Fig. 4 below). Many of the participants played significant roles in the early development of the project. All fifty talks and associated discussions were video recorded. (Convenors were Richard Schilizzi, Ron Ekers, Peter Hall and Phil Crosby.)

2) The WG HRA organised a session on "The Impact of Radio Astronomy on Technology and Society" to be held at the URSI GA in Rome in August 2020, but that has been postponed until late August 2021, again in Rome just after the IAU GA in Busan.

The session will comprise invited talks and contributed posters that focus on the developments and inventions in the history of radio astronomy that have directly or indirectly impacted on society. The invited talks and speakers are:

The Story of Wifi – David Skellern (RoZetta Institute, Sydney)
VLBI, Navigation, and Geodesy - Megan Johnson (USNO)
Cold-war diplomacy at the Jodrell Bank Observatory – Simon Garrington and Tim O'Brien (JBCA)
Radio Interferometry and Medical Imaging – Ilana Feain (CASS)

Deep Space Navigation – Les Deutsch (JPL)
Parkes and Apollo 11 - Jasper Wall (UBC)

Research

Research on historical radio astronomy topics is carried out by individual WG HRA members and other colleagues, and has led to the publications below. Other ongoing research projects will lead to future publications in journals and books.

Biographical Memoirs

The WG website (https://rahist.nrao.edu/) also includes biographical memoirs for deceased radio astronomers.

WG Historical Radio Astronomy publications 2018-2019

Brown, P., 2018. In Memoriam: Ian Halliday (1928-2018), *JRASC*, 112(5), 192.

George, M., Orchiston, W., and Wielebinski, R., 2018. The history of early low frequency radio astronomy in Australia. 9: The University of Tasmania's Llanherne (Hobart Airport) field station during the 1960s– 1980s. *JAHH*, 21(1), 37–64.

Gindilis L.M., Gurvits L.I., 2019. SETI in Russia, USSR and the post-Soviet space: a century of research, *Acta Astronautica* 162, 1-13.

Gurvits, L.I., 2018. Radio Interferometers Larger than Earth: Lessons Learned and Forward Look of Space VLBI. In: *Proc. of IAC*. IAC-18-A-7.2.8 (arXiv 1810:01230 2018.10.03)

Gurvits L.I., 2019, *Space VLBI: from first ideas to operational missions*, Advances in Space Research, in press. (arXiv:1905.11175)

Harris, M., 2019. *Rocks, Radio and Radar. The Extraordinary Scientific, Social and Military Life of Elizabeth Alexander*. https://www.worldscientific.com/worldscibooks/10.1142/q0198

Breus T.K. and Gurvits L.I. (eds.), 2019, *Intelligence, Life, the Universe: a collection of memoirs on I.S. Shjklovsky*, in press. (in Russian)

Orchiston, W., and Swarup, G., 2018. The emergence of radio astronomy in Asia: opening a new window on the Universe. In Orchiston, W., Sule, A., and Vahia, M. (eds.), *Growth and Development of Astronomy and Astrophysics in India and the Asia-Pacific Region. Proceedings of the 9th International Conference on Oriental Astronomy*. (Mumbai, Tata Institute of Fundamental Research) 179–204.

Orchiston, W., George, M., Slee, B., and Wielebinski, R., 2019. Early low frequency radio astronomy in Australia. In Shi, Y.-L. (ed.). *Astronomical Heritages in Asia-Pacific Areas: Proceedings of the Eighth International Conference on Oriental Astronomy*. (Hefei, University of Science and Technology of China). In press.

Orchiston, W., and Phakatkar, S., 2019. A tribute to Professor Govind Swarup, FRS: the Father of Indian Radio Astronomy. *JAHH*, 22(1), 3–44.

Routledge, D., and Vaneldik, J. F., 2018. Wizards' Apprentices: University of Alberta Students and the Evolution of the DRAO Synthesis Telescope, *JRASC*, 112(2), 61-71.

Strom, R., 2018. Historical Introduction, in *50 Years Westerbork Radio Observatory, A Continuing Journey to Discoveries and Innovations*, Strom, R., Van Ardenne, A., and Torchinsky, S. (eds), Proceedings of Science, 23-33.

Swarup, G., Growth of Radio Astronomy at TIFR, India. URSI AP-RASC 2019, New Delhi, India, 09-15 March 2019, in IEEE Xplore.

van Langevelde, H. J., Schilizzi, R. T., van Ardenne, A. 2018, Very Long Baseline Interferometry: the EVN, WSRT, and JIVE. In *50 Years Westerbork Radio Observatory — A Continuing Journey to Discoveries and Innovations, (Netherlands Institute for Radio Astronomy, Dwingeloo)*, ed. Strom, Richard, Van Ardenne, Arnold, and Torchinsky, Steve, 127-137.

Wendt, H., and Orchiston, W., 2018. Contribution of the AN/TPS-3 radar antenna to Australian radio astronomy. *JAHH*, 21(1), 65–80.

van der Kruit, P.C., 2019. *Jan Hendrik Oort -- Master of the Galactic System*. Astrophysics and Space Science Library, 459.

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Figure 4. Poster for the Meeting on the History of the Square Kilometre Array – 1980s to 2012. (SKA Organisation Communications Team, Joe Diamond (SKA Organisation), Carbon Creative)

Johannes Kepler Project Group Report (2018-2020)

T. J. Mahoney (Chair)
Instituto de Astrofísica de Canarias

Kepler's laws and the evolution of ideas on motion in the seventeenth century

JKPG Vice-chair J. V. Field gave a talk ('Heliocentrism, Force and Inertia') at the conference *Perpetual Motion from Leonardo da Vinci to the Present Day*, organized by Dr Field (Birkbeck) and Prof. Frank James (UCL), held at the Royal Institution on 15 February 2020. The talk examined the origins of Kepler's Laws of planetary motion and considered the changes in the under-standing of physics, terrestrial and celestial, that were required to provide a mathematical explanation for these laws in terms of a force of gravitation operating according to an inverse square law. There is a review of the conference at https://www.pelicancrossing.net/netwars/2020/02/obsession.html. James and Field are considering publishing papers from the meeting as a book.

Kepler's work plays a substantial part in Field's discussion of natural philosophy and the mathematical sciences in England in the first few decades of the seventeenth century in considering whether works by Leonardo da Vinci might have been collected for their 'scientific' value. The paper was originally presented at a conference on the collecting of Leonardo's works in Britain and was published last autumn in the volume of Proceedings [1].

The 11 November 2019 transit of Mercury

On 11 November 2019 T. J. Mahoney gave a talk by Skype entitled 'Gassendi's observation of the 1631 transit of Mercury' as part of the programme of live coverage of the transit of Venus for the video conference *Mercurio in Sole Visus*, organized by ICRANet (www.icranet.org), the International Center for Relativistic Astrophysics Network, with headquarters in Pescara (Italy). Ptolemy [2] explained the lack of observations of such transits in terms of Mercury passing above or below the Sun, as does indeed occur when Mercury is new away from the nodes. In 1607 Kepler himself, observing the Sun with a camera obscura, had mistaken a sunspot for a transit of Mercury. Kepler's *Rudolphine Tables* [3], with their two orders of magnitude improvement in accuracy [4], enabled transits of the inferior planets to be predicted with accuracy. In 1629 Kepler [5] published transit details for Mercury and Venus based on Kepler's ephemerides for 1629–1636. The 'warning' was republished by Jacob Barsch, Kepler's son-in-law in 1630 [6]. Although Kepler did not live to see his predictions vindicated, Pierre Gassendi, using projection of the Sun's image, observed the disc of Mercury during the final stage of the transit at 9 a.m. on 7 November 1631 [7,8]. Gassendi calculated that the transit was 4h 49m 30s earlier than predicted by Kepler. He reported his observations in an open letter to Wilhelm Schickard at Tübingen [9].

At the same conference, Jay M. Pasachoff gave a talk on observing projects for the transit. Observations carried out by these projects may be viewed at the website https://sites.williams.edu/pasachoff/2019tom/.

Reading the Mind of God: Johannes Kepler and the Reform of Astronomy

There has been slow progress on the book [10], but most of the chapter are in and the editors (A. E. L. Davis, J. V. Field and T. J. Mahoney) expect to deliver the manuscript to Springer this year.

REFERENCES

[1] J. V. Field, 'Leonardo's afterlife in the world of "new Philosophy" ', in Juliana Barone and Susanna Avery-Quash (eds), *Leonardo in Britain: Collections and Historical Reception* [Proceedings of the International Conference, London, 25-27 May 2016], Florence: Leo S. Olschki, 2019, pp. 167–85, Figs [34–35].

[2] Ptolemy, *Almagest*, ix, 1.

[3] Johannes Kepler, *Tabulae Rudolphinae* (Ulm, 1627).

[4] Owen Gingerich, 'Kepler versus Lansbergen: on computing ephemerides, 1632–1662', *Studia Copernicana* XLII 2009), 113–7.

[5] Johannes Kepler, *De raris mirisque Anni 1631. Phaenomenis, Veneris putae & Mercurii in Solem incursu, Admonitio ad Astronomos, rerumque coelestium studiosos* (Joan-Albertus Minzelius, Leipzig, 1629).

[6] Johannes Kepler and Jacob Barsch, *De raris mirisque Anni 1631. Phaenomenis, Veneris putae & Mercurii in Solem incursu, Admonitio ad Astronomos, rerumque coelestium studiosos* (Frankfurt, 1630).

[7] Robert Grant, *History of Physical Astronomy from the Earliest Ages to the Middle of the Nineteenth Century* (London: Robert Baldwin, 1852), pp. 415–7.

[8] Albert van Helden, *Measuring the Universe: Cosmic Dimensions from Aristarchus to Halley* (Chicago: University of Chicago Press, 1985), pp. 95–106.

[9] Pierre Gassendi, *Mercurio in Sole Visus et Venus Invisus*, in *Petrus Gassendi: Opera Omnia* (Laurentius Anisson: Lyon, 1658), vol. 4, pp. 499–510.

[10] A. E. L. Davis, J. V. Field and T. J. Mahoney (eds), *Reading the Mind of God: Johannes Kepler and the Reform of Astronomy* (in preparation).

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Biographical Encyclopedia of Astronomers III

A Letter from the Editors

In preparation for a third edition of the *Biographical Encyclopedia of Astronomers (BEA III),* we would like to enlist help from those using the current edition to identify any deficiencies in the present work and to suggest astronomers that should be included in the next edition. To that end, we would like your responses to the following four specific questions, as well as any other comments of a more general nature.

Question 1: How have you made use of *BEA II* in your research or writing? What deficiencies have you noted in the present edition? For instance, is the work missing material you had expected to find? Have you noticed biases in specific articles? Is the organization, cross-referencing, etc., unsatisfactory?

Question 2: Which individuals born prior to 1920 who are not covered by *BEA II* do you think should be added in the third edition? Please be specific!

Question 3: If you had to choose 2 or 3 deceased individuals born after 1920 to be included in *BEA III,* who would they be? (For those whose names may not be well-known, please include a few words of explanation.)

Question 4: If the *BEA III* must restrict the definition of "astronomer" in order to cover adequately the great expansion of the astronomical community in the 20th century, which of the following subfields should be excluded or deferred to a future edition?

- Cosmology (theoretical or observational)
- Gravitational wave astrophysics
- High-energy astrophysics (cosmic ray, x-ray, γ-ray)
- Meteor astronomy (optical, radar, theoretical)
- Solar physics (observational, theoretical, helioseismology)
- Space physics (terrestrial electromagnetic and plasma phenomena surrounding the Earth, surrounding other planets, solar wind)
- Aeronomy or studies of the terrestrial upper atmosphere
- Geochemistry (meteorite studies, lunar sample analysis, planetary isotopic evolution, cosmochronology)
- Instrumentation (telescope, spacecraft)
- Cultural studies (ethnoastronomy, archeaoastronomy, history of astronomy, astronomy education)
- Spacecraft design and space engineering
- Dark matter (search for in nature, in laboratory)

First published by Springer in 2007, the *Biographical Encyclopedia of Astronomers* is a unique and valuable resource for historians and astronomers alike. The updated third edition will contain approximately 450 new biographical sketches, but with additions and revisions to the existing articles where

necessary. The new entries will fill gaps in the second edition and extend the coverage of the *Encyclopedia* from individuals born prior to 1920 through those born in 1950, with some exceptions. New entries will include only deceased individuals, but no existing articles will be deleted. The editors-in-chief of the revised work will be Prof. Philip Nicholson of Cornell University and Dr. Jennifer Bartlett of the US Naval Observatory, with Prof. Thomas Hockey of the University of Northern Iowa serving as consulting editor and providing continuity. We are currently recruiting a new set of associate editors.

One problem that immediately arises in determining the scope of coverage for *BEA III* is defining what we mean by an "astronomer". The great expansion of astronomical work from predominantly optical and theoretical studies in the centuries prior to 1900 to include radio, infrared and high-energy astrophysics, as well as the development of entirely new sub-fields such as solar physics, planetary science, space physics and observational cosmology, complicate the selection of articles to be included. We will be guided by the goal of including those individuals whose published work has been *primarily* in astronomy or planetary science, or who have made important contributions to these fields, but, as the *BEA III* project develops, we may have to narrow this criterion, perhaps making distinctions between telescopic and laboratory scientists and between theorists and observers. As a general rule, the *BEA* does not include laboratory scientists or pure theoreticians, although both Harold Urey and Albert Einstein are to be found in *BEA II*. Thoughtful suggestions as to how such choices should be made are also welcome.

Jennifer Bartlett & Phil Nicholson
jennifer@bartlettastro.com, nicholso@astro.cornell.edu

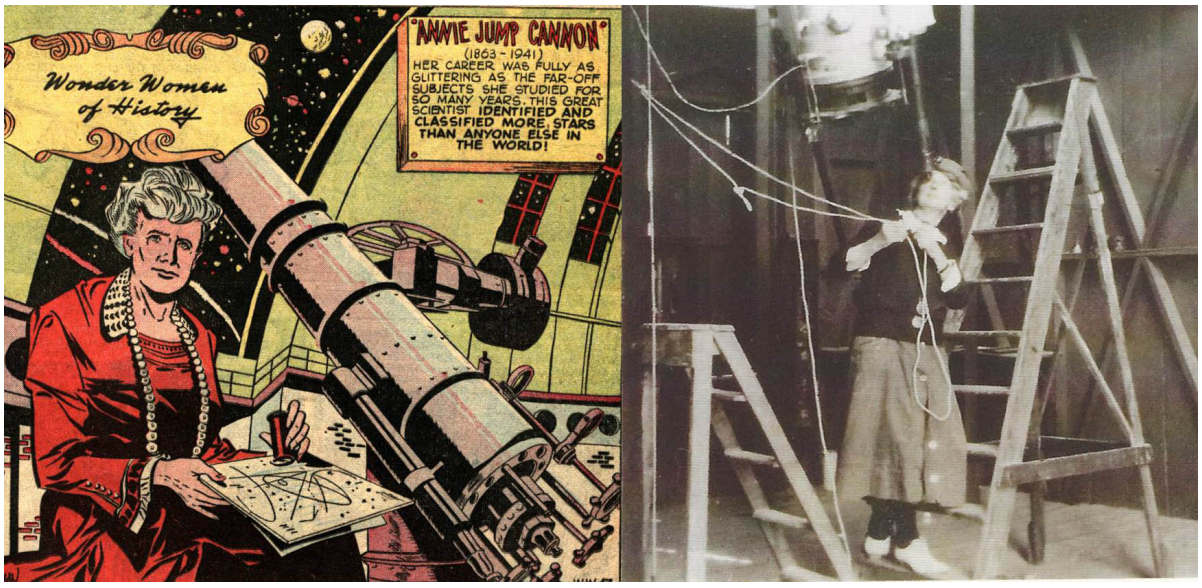


Figure 1. Annie Jump Cannon as a Wonder Woman of History, 1949, and observing with the 13-inch Boyden telescope, Arequipa, Peru, 1922. (Harvard University Archives)

CONGRATULATIONS!

Stella Cottam and **Wayne Orchiston** shared the 2019 Donald E. Osterbrock Book Prize for Historical Astronomy for their book, *Eclipses, Transits, and Comets of the Nineteenth Century: How America's Perception of the Skies Changed* (Springer, 2015). The Prize is awarded biennially by the Historical Astronomy Division of the American Astronomical Society for a recent book judged to advance or promote the field of history of astronomy.

Sara Schechner received the LeRoy E. Doggett Prize for Historical Astronomy in 2018 from the American Astronomical Society. Awarded biennially to an individual who has significantly influenced the field of history of astronomy through a career-long effort, it is the most prestigious prize internationally in the discipline. Schechner was the first woman to receive this award. In 2019, Schechner was the recipient of the Paul Bunge Prize from the Hans R. Jenemann-Stiftung, **G**essellschaft Deutscher Chemiker (German Chemical Society), and Deutsche Bunsen-Gesellschaft für physikalische Chemie (German Bunsen Society for Physical Chemistry). It is regarded worldwide as the most important honor in the history of scientific instruments.

Virginia Trimble received the 2019 Andrew Gemant Award from the American Institute of Physics. This annual award recognizes contributions to the cultural, artistic, and humanistic dimensions of physics.

The American Astronomical Society announced its first class of Fellows in 2020, recognizing AAS members for their original research and publication, innovative contributions to astronomical techniques or instrumentation, and other noteworthy service to astronomy and the Society's mission of enhancing and sharing humanity's scientific understanding of the universe.

Congratulations to C3 members **Jennifer Bartlett, Brenda Corbin, David DeVorkin, Steven Dick, Terry Oswalt, Jay Pasachoff, Iain Reid, Sara Schechner, Patrick Seitzer, Woodruff Sullivan, and Virginia Trimble** for being named AAS Fellows.

NEWS FROM MEMBERS

BEATRIZ GARCIA

Instituto de Tecnologías en Detección y Astropartículas (ITeDA), CNEA-CONICET-UNSAM, Mendoza, Argentina

I would like to draw readers' attention to the Network for Astronomy School Education (NASE)-- http://sac.csic.es/astrosecundaria/en/Presentacion.php. It offers curricula in Spanish on archaeoastronomy, history of astronomy, and cultural astronomy: http://sac.csic.es/astrosecundaria/es/astronomia_en_la_ciudad/Lista.php.

STEVEN R. GULLBERG

Program for Archaeoastronomy and Astronomy in Culture, College of Professional and Continuing Studies, University of Oklahoma

I have been quite busy since Vienna.

The Working Group for Archaeoastronomy and Astronomy in Culture presently has 80 members. We have organized committees to work on the advancement of five initiatives: develop a comprehensive survey document on cultural astronomy, develop cultural astronomy public outreach; compile information about astronomy in contemporary culture; further knowledge of archaeoastronomy in developing nations; and advance collaborative cultural astronomy research with fields such as archaeology and anthropology.

The graduate level program for Archaeoastronomy and Astronomy in Culture for which I led the development at the University of Oklahoma has begun. Our first courses started in January. An undergraduate program will launch next year.

I am delighted to announce my new book, *Astronomy of the Inca Empire: Use and Significance of the Sun and the Night Sky* (Springer Nature, 2020), which is already listed on Amazon. I have several publications regarding archaeo-astronomy and astronomy in culture in the works, three of which have been published by *Astronomishe Nachrichten* of Germany: "Cosmology of the Incas: Effects of Light and Shadow," "Cultural Astronomy and Educational Opportunities," and "Complementary Duality of the Inca's Cosmovision: An Astrophysics Perspective." I will update more the next time. [Details are in the bibliography at the end of the newsletter.]

I greatly enjoy speaking about archaeoastronomy and have taken advantage of many wonderful opportunities to do so since Vienna at conferences in Graz, Austria; Ollantaytambo, Peru (where I was the opening speaker); Flagstaff, Arizona, USA; Havana, Cuba (opening speaker); Hamilton, New Zealand; Cusco, Peru (opening speaker); Bern, Switzerland; Lisbon, Portugal; and Stella Maris, Long Island, Bahamas (where I gave three talks). I have been reaching out to speak to groups outside of archaeoastronomy. Four of those above were to astrophysicists, one was to archaeologists, one was to Native American and Indigenous scholars, and one was to Protolanguage scholars. Additionally, I enjoyed giving outreach presentations to the public and high school students – in La Serena, Chile, Kenton, Oklahoma, USA (two presentations), and Stella Maris, Bahamas (two of the three mentioned above – one public and one high school). The remaining two conferences were for Archaeoastronomy.

During the remainder of 2020 I plan to speak in La Plata, Argentina; Toronto, Canada (roundtable chair); Cusco, Peru (opening speaker); Bath, United Kingdom (session organizer); Stara Zagora, Bulgaria; Mexico City, Mexico (opening speaker); St Louis, Missouri, USA, and Bariloche, Argentina. Four of these are for astronomy/astrophysics, one for Indigenous Studies, one for Anthropology, and two for Archaeoastronomy. I will also pursue more public outreach.

SG Figure 1. Steven Gullberg taking a break in Peru near Ollantaytambo, 2018.

WAYNE ORCHISTON

National Astronomical Research Institute of Thailand, and Centre for Astrophysics, University of Southern Queensland

Currently I'm working on the following books, which will be published by Springer later this year or in early 2021:

Orchiston, W. (ed.), 2020. *The Total Solar Eclipse of 18 August 1868: A Watershed Event in the Development of Solar Physics*.

Orchiston, W., and Vahia, M. (eds.), 2020. *Exploring the History of Southeast Asian Astronomy: A Review of Current Projects and Future Prospects and Possibilities*.

Orchiston, W., Robertson, P., and Sullivan, W.T. III, 2020. *A Pictorial History of Pioneering Radio Astronomy: The Early Years of Australia's Radiophysics Lab*.

Authors or co-authors of chapters in the Solar Eclipse book are: Young-Sook Ahn (South Korea), Visanu Euarchukiati (Thailand), Françoise Launay (France), Eun Hee Lee (South Korea), Emanuel Sungging Mumpuni (Indonesia), Biman B. Nath (India), Darunee Lingling Orchiston (Thailand), Wayne Orchiston (Thailand), B.S. Shylaja (India), Boonrucksar Soonthornthum (Thailand), Wolfgang Steinicke (Germany) and T.V. Venkatiswaran (India).

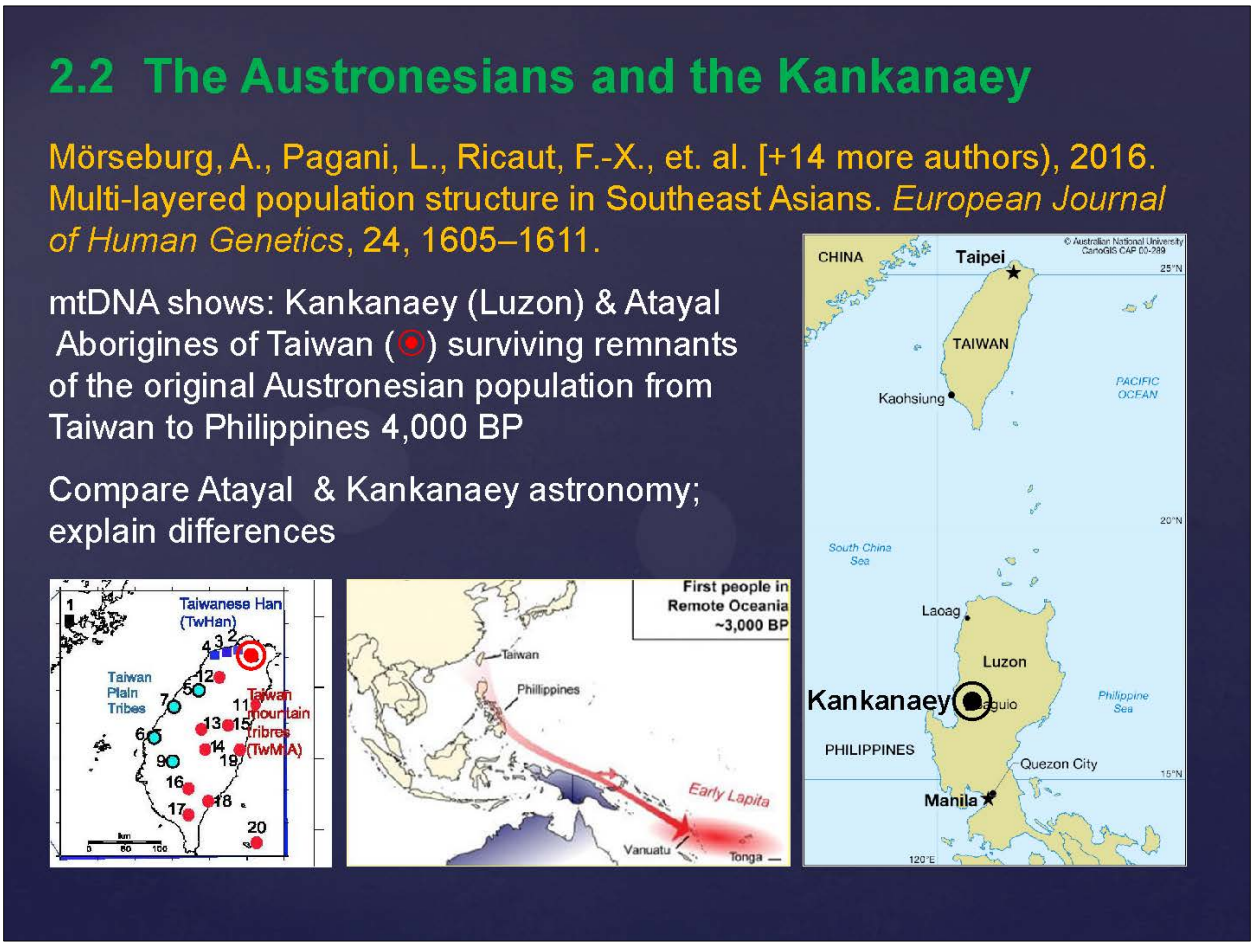
Authors or co-authors of chapters in the Southeast Asian book are: Jeerayut Chaijaruwanich (Thailand), Rendy Darma (Indonesia), Suzanne Débarbat (France), Ni Putu Audita Placida Emas (Indonesia), Visanu Euarchukiati (Thailand), Siti Fatima (Indonesia), Alif Husnul Fikri (Indonesia), Martin George (Australia), Lars Gislén (Sweden), Taufiq Hidayat (Indonesia), Matthieu Husson (France), Papangkorn Inkeaw (Thailand), Nurul Fatini Jaafar (Malaysia), Roger Kinns (Scotland), Ahmad Hakimi Khairuddin (Malaysia), Sitti Attari Khairunnisa (Indonesia), Siramas Komonjinda (Thailand), Françoise Launay (France), Lê Thành Lân (Vietnam), Sri Kumar Menon (India), Emanuel Sungging Mumpuni (Indonesia), Yukio Ôhashi (Japan), Akira Okazaki (Japan), Darunee Lingling Orchiston (Thailand), Wayne Orchiston (Thailand), Phạm Vũ Lộc (Vietnam), Adli A. Rasyid (Indonesia), Orapin Riyoprao (Thailand), Saroj Rujiwarat (Thailand), Cherdsak Saelee (Thailand), Patrick Seitzer (USA), B.S. Shylaja (India), Boonrucksar Soonthornthum (Thailand), Korakamon Sriboonrueang (Thailand), Wolfgang Steinicke (Germany) and Mayank Vahia (India).

Professor Taufiq Hidayat (Institut Teknologi, Bandung, and Bosscha Observatory, Indonesia) and I are preparing a review paper on Indonesian history of Astronomy (including archaeoastronomy and ethnoastronomy), and we plan to publish this in the *Journal of Astronomical History and Heritage*.

Darunee Lingling Orchiston and I are working with Princes Ilagan and Paulo de Mesa from the Philippines, to compare and contrast the astronomical systems of the Atayal ethnic group from Taiwan and the Kankanaey of northern Luzon in the Philippines (see Figure 2). mtDNA evidence indicates that these have almost identical 'genetic footprints' and represent surviving remnants of the Austronesian peoples who swept down from Taiwan into the Philippines about 4,000 years ago. One group then occupied what is now the Indonesian region, and the other group moved swiftly to islands fringing the northern coast of New Guinea and eventually made their way to island Melanesia and out into the Pacific, becoming the Polynesians. For our comparison, we will make extensive use of Taiwanese data assembled by the late Yukio Ôhashi, who will be a posthumous author of the resulting research paper—had he still been alive, Yukio would have co-authored the paper on this topic that I presented at the February 2020 SE Asian conference in Chiang Mai.

I recently began supervising the part-time off-campus history of astronomy PhD of John Drummond who, through the Centre for Astrophysics at the University of Southern Queensland, is researching the history of New Zealand cometary astronomy for his thesis. John has an MSc (Astronomy) from Swinburne University of Technology in Australia) and is the Immediate Past-President and current Secretary of the Royal Astronomical Society of New Zealand. As part of his research he will include a biographical study of Murray Geddes, who was appointed founding Director of Carter Observatory but died during World War II before he could take up this post. John's thesis research will extend from Maori astronomy through to the present day, and in this regard we recently published a paper in the *Journal of Astronomical History and Heritage* on Maori cometary astronomy and the 1886 eruption of Mount Tarawera.

In May 2020 the Royal Astronomical Society of New Zealand will celebrate its centenary, and Darunee



WO Figure 2. Copy of a Powerpoint slide from a recent lecture that I gave at Rizal Technological University in Manila, which illustrates the Itayal-Kankanaey link.

Lingling and I will attend the Centennial Conference, where both John Drummond and I will give papers on the history of New Zealand astronomy. While in Wellington, Darunee Lingling and I will carry out archival work for a planned Volume 2 of my earlier book *Exploring the History of New Zealand Astronomy: Trials, Tribulations, Telescopes and Transits* (Springer, 2016). Volume Two, tentatively subtitled *Savants, Societies, Site Testing and Solar System Astronomy*, will be an edited volume with chapters by me and invited colleagues.

Following a recent 1-week visit to the Department of Astronomy and Space Sciences at Rizal Technological University in the Philippines, I am now collaborating with staff there on a major review of Philippines astronomical history, and especially ethnoastronomy.

I continue to research the history of early Japanese radio astronomy in collaboration with retired radio astronomer, Professor Masato Ishiguro who used to work at the National Astronomical Observatory of Japan in Tokyo. Six papers have been published thus far in this IAU Historical Radio Astronomy Working Group project, with two further papers to be written before we wind up this project.

WO Figure 3. The Kalyan Array was India's first radio telescope. Between 1965 and 1968 it was used to research solar radio emission at 610 MHz.

Finally, after writing a review paper with Professor Govind Swarup on the early development of Asian radio astronomy and publishing a biographical tribute to Govind in 2019 to celebrate his 90th Birthday, I have begun historical research with Govind on aspects of early Indian radio astronomy (e.g. see Figures 3 and 4). We hope to publish our first paper in this series late in 2020.

WO Figure 4. RT Kapahi adjusting the transmission line.

SARA J. SCHECHNER

Collection of Historical Scientific Instruments and
Department of the History of Science, Harvard University

I am pleased to report the publication of my book, *Time of Our Lives: Sundials of the Adler Planetarium* (2019). This richly illustrated, interpretive catalogue is available through the Adler Planetarium's shop (https://shop.adlerplanetarium.org/time-of-our-lives-sundials-of-the-adler-planetarium.html). It is the first of two volumes on the Planetarium's remarkable collection of time-finding instruments. I am currently preparing the second. Other publications in the works include an analysis of Niccolò Tornioli's *The Astronomers* with art historian Susanna Cecilia Berger.

Ongoing research interests include astronomical metaphors and imagery in advertising, the representation of female figures in astronomical settings, Thomas Jefferson's plans for a planetarium, early American telescopes, and scientific glass.

In 2018, I curated an exhibition—*Starstruck! Astronomers and Popular Culture*—with Harvard students from my "Tangible Things" world-history course. And this past spring I taught a new seminar called "Starstruck! The History, Culture, and Politics of American Astronomy." Each unit was anchored by astronomical instruments and other material culture in museums and collections or in situ at the Harvard College Observatory. Jay Pasachoff was a guest one week. He shared his Operation Moonwatch experience. I will be teaching the class again in the spring of 2021.

I have been active in the preservation of astronomical sites (such as observatories) and archival materials (such as photographic plates and their annotations) as a member of the AAS Working Group for the Preservation of Astronomical Heritage. I am particularly distressed by the erasure of the historical annotations on Harvard's glass plates during the DASCH project, and have lectured and published about this.

These invited talks and conference presentations are representative of my recent activities:

"Tangible Things of American Astronomy," 2018 LeRoy E. Doggett Prize for Historical Astronomy plenary lecture at the annual meeting of American Astronomical Society, National Harbor, MD, January 2018.

"Sundials that Tell More than the Time," 2018 Andrew Somerville Memorial Lecture to the British Sundial Society, Norwich, UK, April 2018.

"Paper Dolls and Wonder Women of Astronomy," Symposium of the IUHPST Scientific Instrument Commission, Leiden, September 2018.

"Kilo Girl Hours at the Harvard Observatory," Radcliffe Institute for Advanced Study, Harvard University, November 2018.

"Sundials that Tell More than the Time," 2019 Paul Bunge Prize lecture at the meeting of the History of Chemistry section of the Gesellschaft Deutscher Chemiker, Halle/Saale, Germany, March 2019.

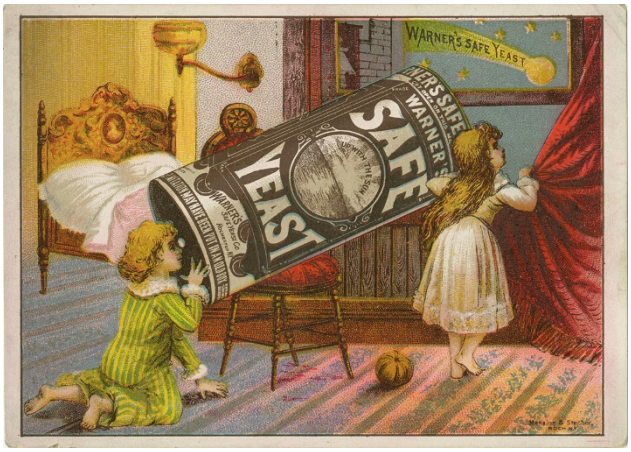
"Conundrums of Preservation in the Harvard Plate Stacks," XIV Biennial History of Astronomy Workshop, Notre Dame, June 2019.

"Bringing the Stars Home: Astronomical Advertising to Sell Goods," XIV Biennial History of Astronomy Workshop, Notre Dame, June 2019.

"What Scientific Instruments Tell Us in Tornioli's Painting, *The Astronomers,*" Symposium of the IUHPST Scientific Instrument Commission, Havana, Cuba, September 2019.

"Astronomy Inside and Out: Jefferson's Vision for the University of Virginia," keynote lecture at *Rotunda Planetarium: Science & Learning in the University of Virginia's First Library*, a public symposium and event culminating in the unveiling of a 70- foot celestial map projected onto the Rotunda's ceiling. Charlottesville, VA, November 2019.

"Touching the Sky: Tangible Things of American Astronomy," Lyne Starling Trimble Science Heritage Public Lecture, American Institute of Physics, College Park, MD, November 2019.



SJS Figure 5. Victorian trade card advertising Warner's Safe Yeast

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B. S. SHYLAJA

Jawaharlal Nehru Planetarium
Bengaluru, India

I am pleased to report fifteen publications since the Vienna General Assembly on observational records of stars, comets, eclipses in Indian texts. [They are listed in the bibliography at the end of this newsletter.]

I am currently working on four research projects:

a. Study of Stone Inscriptions.

   These inscriptions found all over India, serve as important and unexplored records of celestial events. My previous efforts were centered around South India, I plan to extend it to all over India and if collaborators are available, to all over South East Asia.

b. Study of observational records on stars in different texts.

   Efforts have shown that more than 106 stars have been observed by earlier astronomers of the medieval period here in India. We have successfully identified the stars and a magnitude scale prevalent in those days. Further work hopefully will help in tracing variable stars.

c. Study of the texts of medieval period.

   There are many palm leaf manuscripts waiting to be studied. I am currently working on two works: one in Sanskrit (Brahmatulya udaharanam) and the other in Kannada (Ganithagannadi) are being studied for critical analysis and translations. The first text contains worked examples of celestial events of the 15th century and the other dated 17th century, provides a procedure slightly different from the conventional texts.

d. Miscellaneous.

   Study of various texts for astronomical records, observational techniques and the like. Search for comet records in the history of Kashmir, listing new technical terms coined during colonial period and a search for a very high value of index in mathematical equations, presented in 100 year old algebra book.

Some presentations I have given at conferences, seminars, and workshops since the since the Vienna GA include:

a. "Stone inscriptions as records of celestial events in South Asia", Proceedings of Focus Meeting 5, IAU 2019.
b. "Records of Supernovae from India", Astronomical Society of India Meeting, Bengaluru, 2019.
c. "Observational techniques and evolution of technical terms in astronomy", proceedings of the workshop held at Kanchi, India, November, 2018 (in press).
d. "Records of Supernovae from India", 2019, Historical Supernovae, Novae and Other Transient Events, Leiden, October 2019.
e. "Investigating the Astronomical Histories of India and South East Asia: the Role of Stone

Inscriptions", SEAAN History And Heritage Working Group: Exploring the History of SE Asian Astronomy, 3–4 February 2020, Chiang Mai, Thailand

I have been trying to motivate younger generation people to take up the study of history of astronomy. The biggest hurdle is to dissociate it from astrology. I have conducted several workshops to educate people of all age groups, teachers and students on the methods and techniques used in the past for prediction of eclipses, occultations and similar events. The total solar eclipse of December 2019 provided a very good opportunity to achieve this goal. Coordinated activities with four groups in South India set a very good beginning and the participants are eagerly looking forward to the next one in June 2020.

JOHN M. STEELE

Department of Egyptology and Assyriology, Brown University

I am pleased to report the publication of two books: *The Babylonian Astronomical Compendium MUL.APIN* (Routledge, 2019), which is co-authored with Hermann Hunger, and *Keeping Watch in Babylon: The Astronomical Diaries in Context* (Brill, 2019), co-edited with Johannes Haubold and Kathryn Stevens. I have also published eight articles on Babylonian astronomy. [They are listed in the bibliographic section of this newsletter.]

Yuzhen Guan and I organized this conference: Eclipses in China and Mesopotamia: A Comparative Workshop, 9–13 June 2019, Hefei, China. Speakers included Christopher Cullen, Longfei Chu, Chen Ji, Jeanette Fincke, Yuzhen Guan, Hermann Hunger, Daniel Morgan, Weixing Niu, Anjing Qu, John Steele, Zackary Wainer, and Xianhua Wang.

I am currently working on a book on the development of the astral sciences in Babylonia during the first millennium BCE.

CHRISTIAAN STERKEN

Physics Department, Vrije Universiteit Brussel

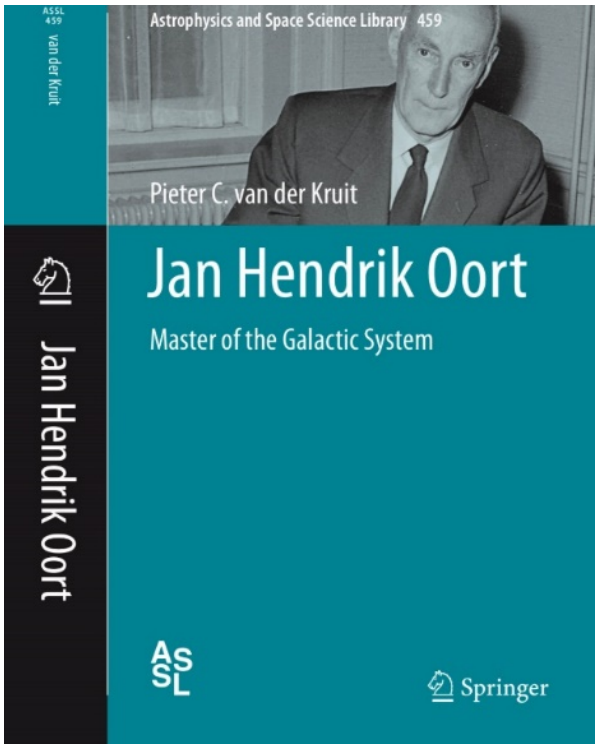
I published a book, *Under One Sky: The IAU Centenary Symposium* (2019), which I co-edited with John Hearnshaw and David Valls-Gabaud. My chapter in the book was "IAU Commission 25, and the development of early photometric systems."

In 2019 I participated in the Symposium of the Scientific Instrument Commission in Havana, Cuba, where I delivered a paper on "Jean-Charles Houzeau's novel instrumental approach for observing the 1882 Transit of Venus."

PIETER C. VAN DER KRUIT

Kapteyn Astronomical Institute, University of Groningen

I am pleased to report the publication of my book, *Jan Hendrik Oort: Master of the Galactic System*, Astrophysics and Space Science Library, 459 (Springer, 2019). This richly illustrated biography of one of the most influential astronomers of the 20th century is based on extensive archival studies, including documents in Dutch. Please visit my special webpage for links to Oort's archives. www.astro.rug.nl/JHOort



YUKIO ÔHASHI

1955-2019

It is with great sadness that I report the unexpected death of the distinguished Japanese historian of astronomy Dr Yukio Ôhashi on 31 October 2019.

Yukio was born in 1955 and completed BSc and MA degrees in Physics and Chinese Culture respectively at Saitama University in Japan. He then went to India and completed a PhD in History of Mathematics at Lucknow University.

Apart from an intense interest in the history of Indian astronomy, over the years Yukio researched and wrote on Tibetan, Chinese, Korean, Japanese and SE Asian astronomy. He published many papers in journals and as chapters of books, and he was close to finishing a book on Classical Indian astronomy for Springer when he died.

Yukio was a long-standing IAU member and active in Commission C3 and its predecessor (C41). He served on the Editorial Board of the *Journal of Astronomical History and Heritage (JAHH)*, and was a member of the Executive Committee of the International Conference on Oriental Astronomy (ICOA). He attended a succession of ICOA conferences, plus the 2016 conference on the History of World Calendars and Calendar-making, which held in South Korea. This was where Figure 1 was taken. He also attended the first two conferences of the History & Heritage Working Group of the SE Asian Astronomy Network.

Always a mine of information and an expert referee for many *JAHH* papers, Yukio also loved the social side of astronomy conferences, and especially the field trips and ICOA conference dinners and associated after-dinner sing-alongs. Yukio was a dear friend, and Lingling and I miss him terribly. Conferences will not be the same without him.

A more detailed obituary will be published in the April 2020 issue of the *Journal of Astronomical History and Heritage*.

Wayne Orchiston

ALEXANDER ARONOVICH GURSHTEIN

21 February 1937 – 3 April 2020

Alexander A. Gurshtein, Ph.D., passed away in his home in Grand Junction, CO last week. He is survived by his wife, Olga Vorobieva; children, Kirill, Ksenya, and Michael; four granddaughters, and three great-grandchildren.

Alex was born in Moscow, Russia during the height of the Stalinist purges, and his early years were shaped by the privations of WWII and the loss of his father in that war, as well as the anti-Semitism that he, like thousands of Soviet Jews, experienced firsthand when finishing school and entering university in the mid-1950s.

As a boy, Alex got fascinated by astronomy by visiting the Moscow Planetarium, and it remained his passion for his entire career. Graduating with a degree in astrometry from the Moscow State Institute of Geodesy and Cartography (1959), he quickly went on to work inside the Russian Academy of Sciences for

the Soviet space program in the headiest years of the Cold War space race. He worked first at the Shternberg State Astronomy Institute and later at the Institute for Space Exploration. At the height of his career, the research group he led chose landing locations for Soviet unmanned missions to the Moon. Telling stories about his various encounters with a cast of colorful characters in those years was one of Alex's favorite pastimes; his memoir, A Moscow Astronomer at the Dawn of the Space Age (2012), contains a detailed and lively account of that period, enhanced by the author's uncanny ability to remember names and dates.

The son of a notable literary critic and translator, Alex always had literary ambitions. Even in the years of his work for the space program, he wrote numerous popular science articles for Soviet newspapers, magazines, and radio on the topics of astronomy and space exploration. One of his proudest moments was sneaking into national print a quote from poet Maximilian Voloshin, whose poetry was banned and censored by Soviet authorities. In 1973, he published The Eternal Secrets of the Sky, a book on the history of astronomy for young adults that had two subsequent editions and a total print run of 400,000. Around 1980, while on temporary professional hiatus, Alex spent his time researching and writing a historical novel about the founding of the Paris observatory. He published that book as The Stars of Paris in 2016.

In 1981, he began a new professional chapter at the Institute for the History of Natural Sciences and Technology. Since the early 1990s, he turned his attention to the earliest history of the Western Zodiac. He saw as the most significant scientific accomplishment of his career the theory of the origin and development of the Zodiac that he elaborated in numerous Russian and English language articles and set down in its most complete form in The Puzzle of the Western Zodiac: Its Wisdom and Evolutionary Leaps. A Painful Ascent to the Truth (2017).

Alex was a creative polymath who followed his many curiosities. He saw through the publication of at least two board games in the USSR. He also deeply loved the history of Moscow-the simplest of walks around his central Moscow neighborhood would turn into a fascinating excursion. Knowing the city intimately, in the early 1990s, he got involved with Russian television, reconstructing the fictional broom flight of Margarita from the novel The Master and Margarita for one TV episode. At various points, he served as an advisor on science education at the Russian Ministry of Education, helped vet astronomy-related stamps for the Russian postal service (he was an avid life-long philatelist and bibliophile), advised on book illustrations for children's science books, and served as a Deputy in a District Council of People's Deputies in the tumultuous days of Russia's transition to democracy in the early 1990s. In 1995, Alex was able to bring his family to the United States, settling in Grand Junction, CO, where he taught at Mesa State College (now Colorado Mesa University) until 2010. He leaves behind a global network of family members, friends, colleagues, and students who were touched by his energetic pursuit of knowledge, deep commitment to education, and passionate engagement with his work over the course of six decades.

Excerpt from *The Daily Sentinel*, 8 April 2020

We have just learned that **JAMES CAPLAN (1942-2020)** passed away on 8 May 2020 from complications due to cancer.

Originally from Chicago, Jim spent his career working at the Observatoire Astronomique de Marseille-Provence. He was also active in the field of historic astronomical instruments and observatories.

We hope to share an obituary in the next newsletter.

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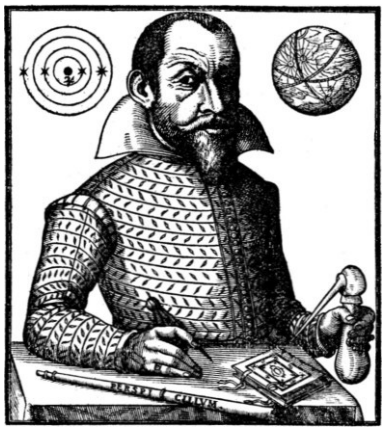
Press Release 10
18.11.19



SiMaG e.V.
Simon Marius Society
Hastverstraße 21
90408 Nürnberg
Germany
info@simon-marius.net
www.simag-ev.de

1. Simon-Marius-Anniversary 2014 finally at the Finish Line

After nine years of work, the English Marius volume has been published, concluding the Simon Marius Anniversary 2014. Thus the follow-up to the Marius Celebrations has taken five years, a little longer than the preparation. Highlights were the launching of the Marius Portal in the State Archives in Nuremberg, the designation of the asteroid "(7984) Marius" by the International Astronomical Union and the conference "Simon Marius and His Time" in the Nicolaus-Copernicus-Planetarium Nuremberg. The conference proceedings were published in German in 2016.

The editors Dr. Hans Gaab and Pierre Leich were, of course, aware: "That a German publication was not sufficient and that international dissemination of the current research on Marius could only be achieved through an English publication." The well-known American solar eclipse expert Jay Pasachoff made contact with with Springer, the second-largest player in this segment. Nevertheless, the change in citation methods and multiple proofreading took a lot of time. In addition, an offer by astronomy historian Albert van Helden opened up a new perspective. He was willing to provide a completed English translation of Marius's main work "Mundus Iovialis". Thony Christie was in charge of the historical editing and Springer paid attention to the form.

The result is a book that combines the most important primary source with 19 current research contributions in English. At a presentation at the University of Erlangen-Nuremberg, one of the first copies was handed over to Prof. Dr. Michael Lackner, who heads the International Consortium for Research in the Humanities "Fate, Freedom and Prognostication."

The largest sponsors of the project are Hermann Gutmann Stiftung, Stiftung NV, Vereinigte Sparkassen Gunzenhausen, Kost-Pocher'sche Stiftung, N-Ergie, the cities of Ansbach, Gunzenhausen and Nuremberg as well as the district of Weißenburg-Gunzenhausen.

2. background

Simon Marius (1573–1624) was margravial court astronomer in Ansbach, Southern Germany and independently of Galileo Galilei discovered the four largest moons of Jupiter and the phases of Venus – important arguments for the heliocentric world system, which still had not been proven in 1610. Since Galilei wrongly—as we know today—accused Marius of plagiarism the Franconian was largely forgotten by the history of science. The Simon Marius Society cultivates his scientific heritage, operates the Marius portal www.simon-marius.net and stimulates research with lectures and publications.

A brief outline of Marius's life and research results can be found on the Marius Portal at

https://www.simon-marius.net/index.php?lang=en&menu=2. This Internet presentation lists all works by and about Marius in 33 menu languages and was activated during the Simon Marius Anniversary 2014.

3. table of contents

The table of contents with links to the authors and the German essays can be found at https://www.simon-marius.net/pix/content/16/Simon-Marius-and-His-Research_Content.pdf.

4. blurb

The margravial court astronomer, Simon Marius, was involved in all of the new observations made with the recently invented telescope in the early part of the seventeenth century. He also discovered the Moons of Jupiter in January 1610 but lost the priority dispute with Galileo Galilei, because he failed to publish his findings in a timely manner.

The history of astronomy neglected Marius for a long time, finding only the apologists for the Copernican system worthy of attention. In contrast the papers presented on the occasion of the Simon Marius Anniversary Conference 2014, and collected in this volume, demonstrate that it is just this struggle to find the correct astronomical system that makes him particularly interesting. His research into comets, sunspots, the Moons of Jupiter and the phases of Venus led him to abandon the Ptolemaic system and adopt the Tychonic one. He could not take the final step to heliocentricity but his rejection was based on empirical arguments of his time.

This volume presents the current state of research, refines his biography and also introduces Marius as a calendar maker. Finally this volume contains a complete translation of Simon Marius's magnum opus "Mundus Iovialis".

5. online-info

Marius Portal: https://www.simon-marius.net/book
Springer: https://www.springer.com/gp/book/9783319926209#aboutBook

6. press contact

President Simon Marius Society, publisher Marius Portal, co-editor of the Marius books:
Pierre Leich pierre.leich@simag-ev.de

Press area with texts and photos:
https://www.simon-marius.net/index.php?lang=en&menu=13

JOURNAL CONTENTS

The Antiquarian Astronomer

Issue 13 June 2019
Edited by Ian Ridpath for the Society for the History of Astronomy

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Journal of Astronomical History and Heritage

2018-2020
Wayne Orchiston, Co-founder and Editor

Following is a list of review papers, research papers and book reviews published in the *Journal of Astronomical History and Heritage (JAHH)* since the Vienna IAU General Assembly in August 2018.

All back issues of the *JAHH*, from Volume 1 (1998) through to the present day (Volume 22, 2019) are available via https://www.jahh.org. This web site also includes a 'Guide for Authors'. All *JAHH* papers also can be downloaded from the NASA/Smithsonian ADS site.

1 December 2018 [Figure 1]

1.1 Research Papers

5 The April 2020 Issue

This issue is nearing completion, and will include the following research papers:

Australian eclipse expeditions: James Short and the eclipses of 1908, 1910 and 1911
Nick Lomb
Cook's Third Voyage to the Pacific and early scientific astronomy on the north-western coast of America: the sojourn at Nootka Sound in April 1778
Wayne Orchiston and William Wells
Seeking an inconstant constant: the quest to discover the variability of the Sun from William Herschel to Andrew Ellicott Douglass
William Sheehan and G. Wesley Lockwood
Understanding *Śṛngonnati*: elevation of the Moon's cusps (with examples)
B.S. Shubha, B.S. Shylaja, and P. Vinay
Astronomical dating of seven Classical Greek eclipses
F.R. Stephenson, L.V. Morrison, and C.Y. Hohenkerk
There also will be an Obituary for Yukio Ôhashi.

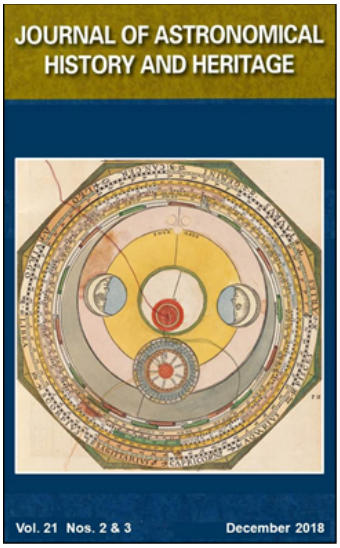


Figure 1

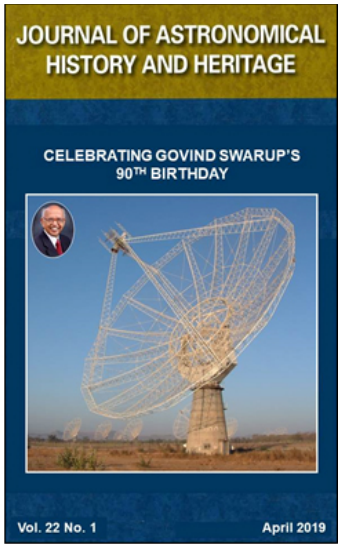


Figure 2

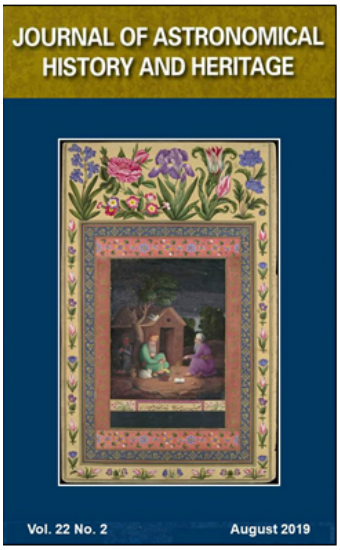


Figure 3

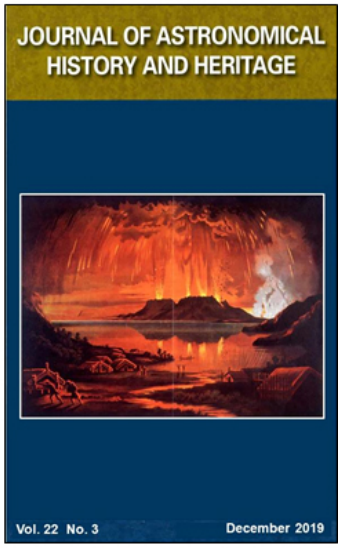
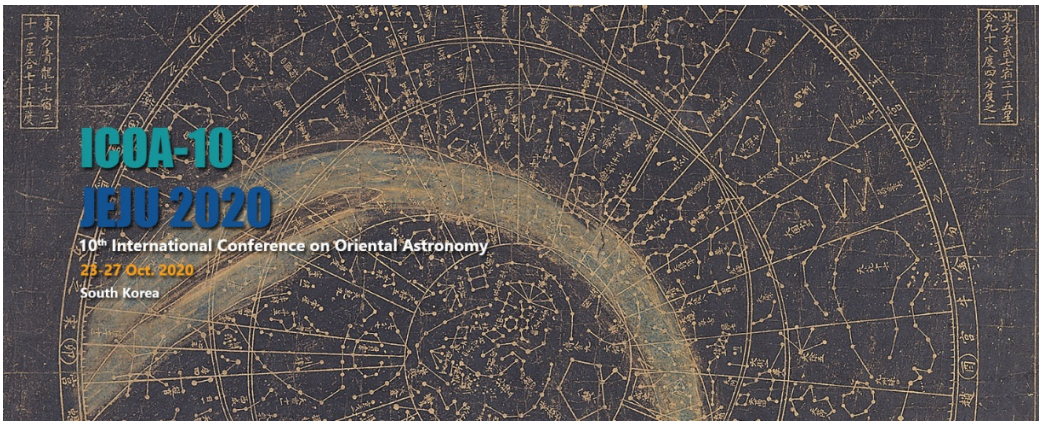


Figure 4

UPCOMING CONFERENCES & CALLS FOR PAPERS



ICOA-10

https://www.icoa2020.org/

Dear Colleagues,

We are delighted to invite you to attend the 10th International Conference on Oriental Astronomy (ICOA-10), which will be held on Jeju Island, Republic of Korea, on 23-27 October 2020, at The Suite Hotel Jeju. ICOA-10 is hosted by the Korea Astronomy and Space Science Institute (KASI) and the Korean Space Science Society (KSSS) and is supported by IAU Commission C3 (History of Astronomy).

The main theme of ICOA-10 is "Patrons and Patronage of Astronomy in the Asia-Pacific Region". This conference discusses the history of astronomy from antiquity up to the 20th century for nations of the Middle East, and South, Southeast and East Asia, and the Pacific Rim. It also targets the astronomy of European countries that had historical links with these regions.

This conference will include the following research themes:

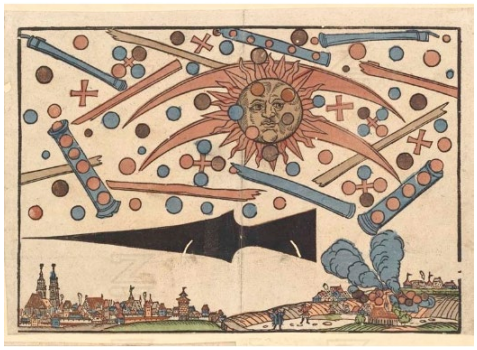
a) History of Astronomy in East and Southeast Asia, India, and the Middle East
b) Applied Historical Astronomy
c) Historical Records and Observations
d) Ancient Observatories and Their Astronomical Instrumentation
e) Calendars, Calendrical Science and Chronology
f) Star Maps and Star Catalogues
g) Ethnoastronomy and Archaeoastronomy
h) Exchange and Development of Astronomical Knowledge
i) The Development of Astrophysics and Radio Astronomy
j) Other Recent Research

We particularly encourage young scholars to participate in the conference by presenting papers. (Contact e-mail: icoa2020@kasi.re.kr)

Best regards,

Mihn, Byeong-Hee
LOC chair of the ICOA-10

PhD. Mihn, Byeong-Hee
Senior Researcher, Korea astronomy and Space Science Institute
Assistant Professor, Korea University of Science and Technology
776, Deadoek-daero, Yuseong-gu, Daejeon, 34055, Republic of Korea
(T) +82-42-865-2044 (F)+82-42-865-3272 bhmin@kasi.re.kr



Writing the Heavens. Celestial Observation in Literature, 800–1800

Dr Karl Remeis Observatory, Bamberg (Germany).
May 20-22, 2021

Organized by ELINAS: Center for Literature and Natural Science.

Deadline for submissions: 31 May 2020

This interdisciplinary conference seeks to establish and facilitate a dialogue between literary studies, astronomy (and physics more generally), and the history of science. The convenors invite papers on medieval and early modern 'literature' of celestial observation in a broad sense, ranging from what would today be deemed 'fictional' to 'non-fictional' writings, from scholarly works to popular genres.

For more details, visit CFP. Contact email: klaeger@uni-bayreuth.de

Astronomical Observatories and Chronometry
Time, Science and Instruments (18th-20th Century)

Musée international d'horlogerie, La Chaux-de-Fonds
2-4 December 2020

Over the last decades, several studies have been devoted to the history of astronomical observatories, to the emergence of a culture of precision in their context, and to the professionalisation of astronomy. The growing interest in the material history of science has also much contributed to unveil the importance of observational technologies and their innovation. In this context, several recent research projects are endeavouring to understand the configuration of the material culture of astronomical observation. Such inquiries require an elaborated approach combining the history of science and the history of scientific instruments, soliciting the expertise of historians, restorers, and specialists of museum collections.

The workshop *Astronomical Observatories and Chronometry: Time, Science and Instruments (18th-20th Century)* will focus on the importance of observatories in the determination of exact time, in the technological innovation of scientific instruments and the improvement of observational techniques, in the diffusion of the measure of exact time among the public, and in testing and certifying precision chronometers. In the framework of this event, the role of observatories as centres of astronomical and astrophysical research will be secondary.

Topics of the workshop will include (but not be limited to):

- The relationship between astronomy and time
- The history of chronometry and the role of chronometric observatories

- The crafting of precision instruments and their trade
- The history of watchmaking industry as of the 18th century
- Scientific practices and the technical know-how in observatories between the end of the 18th century and the mid-20th century

The main purpose of the workshop is to gather senior scholars, students as well as museum's curators and restorers interested in the study of the aforementioned topics. Senior scholars will introduce and discuss the main topics of the workshop and foster the discussion, while the other participants will have the opportunity to present their research.

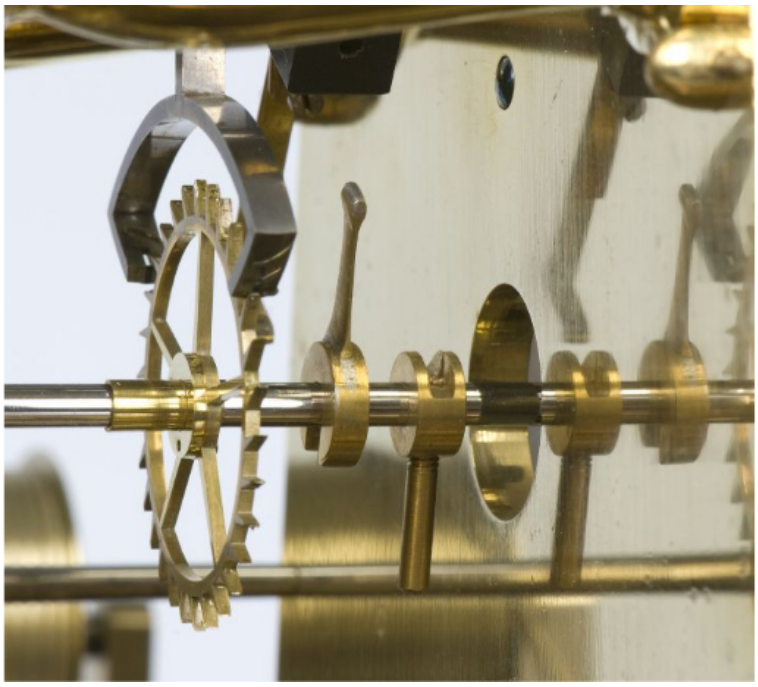
Confirmed participants:

Emiliy Akkermans (Royal Museums Greenwich)
David Aubin (Sorbonne Université, Faculté des sciences)
Gianenrico Bernasconi (Université de Neuchâtel)
Paolo Brenni (CNR, Museo Galileo, Florence)
Günther Oestmann (Technische Universität Berlin)
Gudrum Wolfschmidt (Universität Hamburg)

Abstracts (max. 500 words) along with a CV should be sent to gianenrico.bernasconi@unine.ch and p.brenni@museogalileo.it by **24 July 2020** at latest. Presentations can be in either French or English. Accommodation and travel expenses will be covered.

In consideration of the Covid-19 crisis, the event might be rescheduled for **26-28 May 2021** in case reasons of public health will demand it.

Organisers: Gianenrico Bernasconi (Université de Neuchâtel), Paolo Brenni (CNR, Museo Galileo, Florence).



A view of the movement between the plates of an astronomical regulator by Simon Willard Jr., Boston, 1832. It shows the Graham deadbeat escapement with jeweled pallets. To the right of the escape wheel on the same arbor is the break-circuitry contact finger and its counter balance. (The other end of the contact has been moved out of the way, because it is not being used.) (Collection of Historical Scientific Instruments, Harvard University, inv. no. 2500)

CONFERENCE REPORTS

ICOMOS SYMPOSIUM, NOVEMBER 2018

Wayne Orchiston

On 11–12 November 2018 ICOMOS Australia ran a symposium in Hobart, Australia, on "Under the Microscope – Exploring Science Heritage". This meeting was about Australia's long history of science and innovation, and the identification and conservation of this heritage. This multidisciplinary meeting included a 1-day field trip.

One of the papers presented at the symposium was on the history of radio astronomy:

"Tasmania's Very Low Frequency Radio Astronomy Sites"
by Martin George, Wayne Orchiston & Richard Wielebinski

This discussed Tasmania's unique contribution to international low frequency radio astronomy during the 1950s through 1970s (e.g. see Figure 1), and the need to signpost and interpret the various field stations. The descriptions of the different field stations largely were drawn from Martin's University of Southern Queensland PhD thesis and the series of papers that we published in the *Journal of Astronomical History and Heritage*. Before his death Dr Bruce Slee was one of Martin's PhD supervisors, and he also co-authored some of these papers.

Papers from the Hobart Symposium are currently in the process of being published, and a copy of our radio astronomy paper can be obtained from the author.

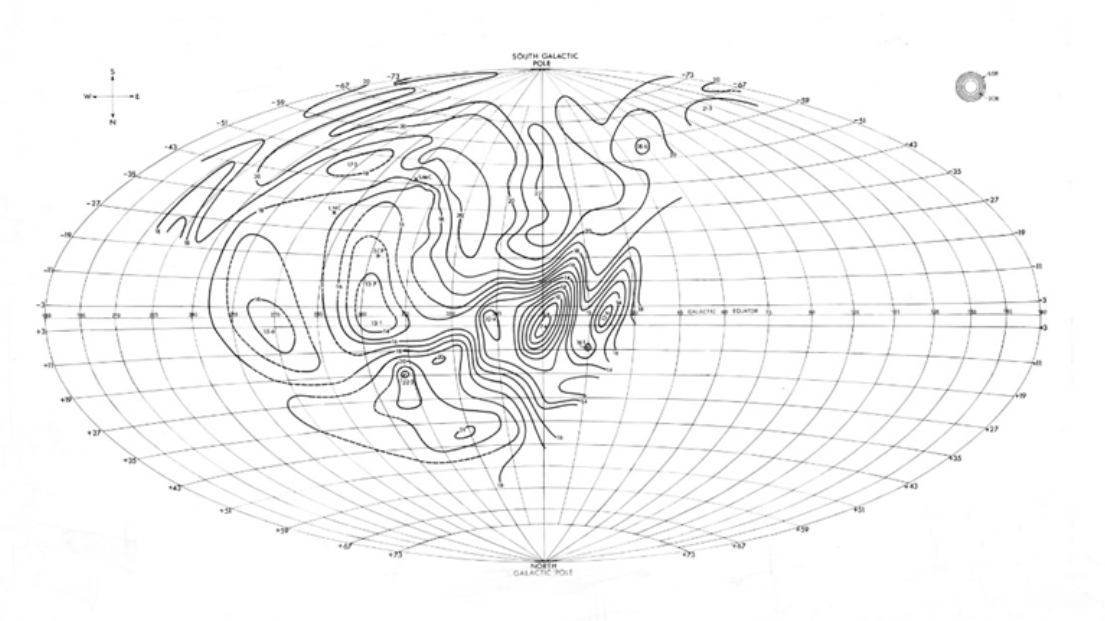


Figure 1. An isophote plot of 2.085 MHz galactic radio emission obtained by Grote Reber. Observations were carried out during 1963–1967 with the world's first 'Square Kilometer Array' which Reber constructed near Bothwell, in Tasmania.

SEAAN, DECEMBER 2019

Wayne Orchiston and Darunee Lingling Orchiston

The Annual Meeting of the Southeast Asian Astronomy Network (SEAAN) was held at the National University of Singapore, on 26–28 December 2019, bringing together astronomers working in ASEAN nations (Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia, Singapore, Philippines and Indonesia). The first day of the conference featured an

annular eclipse of the Sun, which was clearly visible through thin cloud. The following two days featured national reports, a report that I presented about the SEAAN History & Heritage Working Group, and a series of astrophysics papers. Darunee Lingling and I also presented the following historical paper, which was well received: "Temples, telescopes, eclipses and ethnoastronomy: Southeast Asia's exciting astronomical history." One of the slides in our Powerpoint presentation is shown in Figure 2.

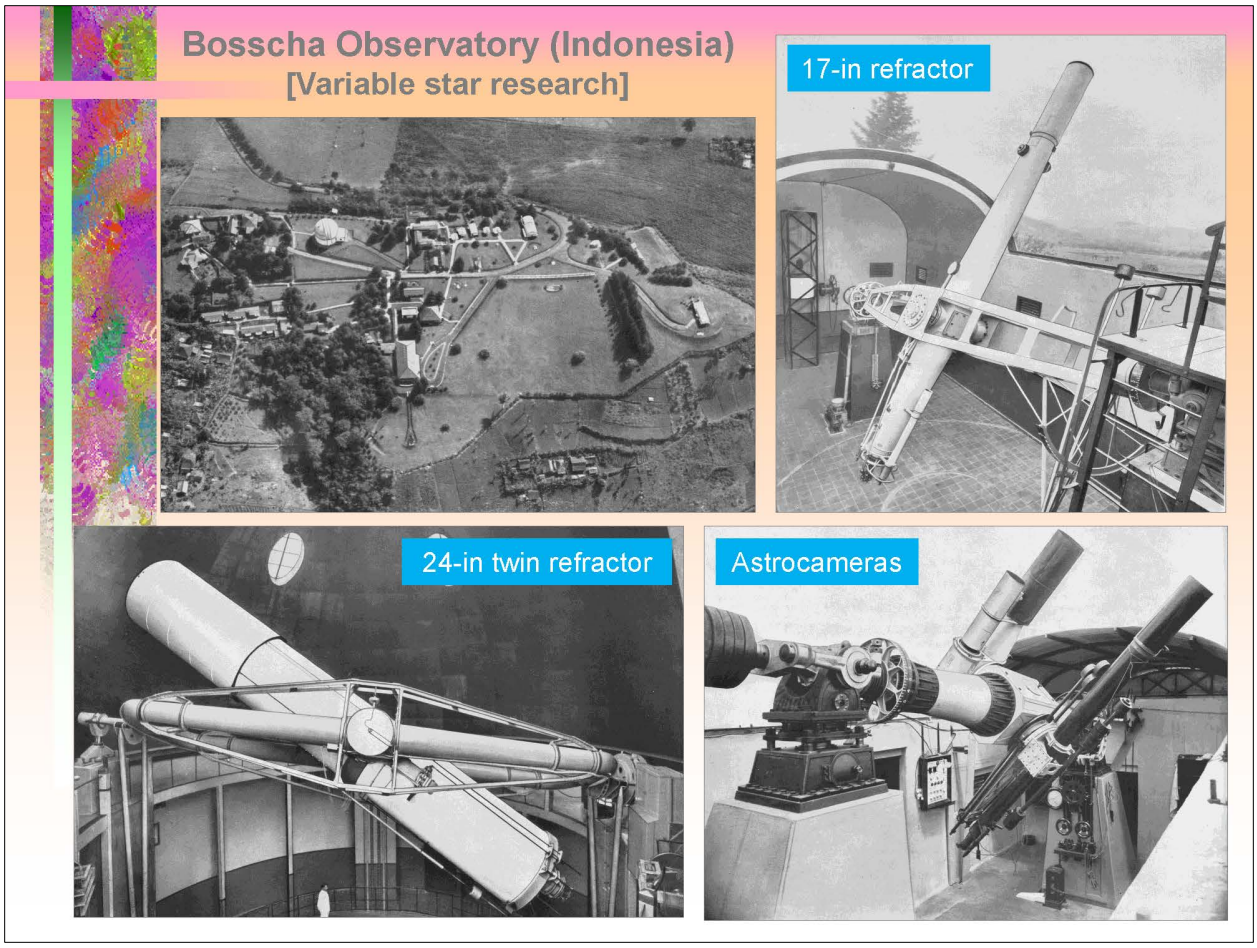


Figure 2. One of our Powerpoint slides showing Bosscha Observatory in Indonesia, and some of its historically significant telescopes. Note the equatorial mountings, indicative of an observatory site located near the equator.

2020H&H

Wayne Orchiston

2020H&H, the third conference of the History and Heritage Working Group of the SE Asian Astronomy Network was held in Chiang Mai, Thailand, on 3–5 February 2020, and was attended by astronomers from Indonesia, Malaysia, the Philippines, Scotland, Sweden, Thailand, USA and Vietnam. There also were Skype presentations by astronomers in Japan and the USA, and papers by Australian and Indian astronomers who could not attend were read *in absentia*. The program included an enjoyable Conference Dinner and 'sing-along'.

The conference was hosted by the National Astronomical Research Institute of Thailand (NARIT), with support from IAU Commission C3 (History of Astronomy). After two days of papers, there were half-day field trips to NARITs new recently-opened headquarters precinct on the outskirts of Chiang Mai, and to a museum dedicated to King Rama V and one of his wives (see Figure 3). The King had an active interest in astronomy, and he invited a contingent of British astronomers to Siam in 1875 so they could observe the 6 April total solar eclipse.

Selected papers from 2020H&H will join papers from the two earlier Working Group conferences and will be published later this year in the following book:

Orchiston, W., and Vahia, M. (eds.), 2020. *Exploring the History of SE Asian Astronomy: A Review of Current Projects and Future Prospects and Possibilities*. Cham (Switzerland), Springer.

Figure 3. The Dara Pirom Palace Museum in Chiang Mai, dedicated to King Rama V and one of his wives.

ASIAN OBSERVATORIES

Wayne Orchiston

On 27–28 February 2020 the University of the Philippines (Diliman Campus) in Manila hosted a conference on "Where Empire and Science Met: Observatories in Asia in the Late 19th to Mid-20th Centuries". This was attended mainly by staff and students from the university.

Although the Conference was about Observatories, most of the papers presented were by historians who had researched the contributions that observatories in Japan, China, Vietnam, Malaya, the Philippines and Indonesia made to climate studies, rather than astronomy, and/or the place of these observatories in the development of colonial science. The only papers that specifically dealt with astronomical research were those about Thailand (presented by Darunee Lingling Orchiston and me – see Figure 4) and India (but Professor Rajesh Kochhar was a last minute withdrawal because of medical issues).

Attending a non-astronomical conference like this was a new experience for Darunee Lingling and me, but the conference was well organised and was enjoyable, as also were the Conference Dinner and the field trips. A book containing papers based on the conference presentations will be published next year by the National University of Singapore.

Darunee Lingling and I congratulate Professor Maria Diokno and Dr Kerby Alvarez for organising an excellent conference, and we are very grateful to the SEASREP and Ynchausti Foundations for funding our attendance.

Figure 4. The title slide in our presentation.

THE TRANSIT OF MERCURY 2019 MEETING
Mercurio in Sole Visu

Costantino Sigismondi

Even in short words, it is worth to recall the success of the Mercury transit meeting celebrated in Pescara on November 11, 2019, thanks to the international connections set up upon the advice of Wayne Orchiston.

The group of conveners, either in person or online, with the people in room assembled from 11 AM up to 18 PM. The observation of the transit of Mercury was available not only online, but also with the ICRANet refracting telescope, thanks to a "cloud break" over Pescara at the time of the first contact (the rest of Italy was under heavy cloud cover and rain).

From the Canary Islands Terry Mahoney presented to us the figure of Kepler and his importance in the first successful transit of Mercury (1631, one year after his death). Marcelo Emilio from Brasil described to us the accuracy of solar diameter measurements through the SOHO satellite up to 15 km, and the result of his analyses of past transits of Mercury which show no variation within this figure in 2003 and 2006 transits and with 2004 and 2012 Venus transits.

Vladimir Belinsky of ICRANet and INFN explained the history of Relativistic Corrections to Newtonian gravitational theory that appeared exactly in the study of Mercury's orbit.

Jay Pasachoff showed to us the different engagements in the observations of such rare phenomenon ground based from US and ESO, with his multidecadal experience in this field.

The issue of this meeting has been the one of gathering strongly History of Astronomy with an astronomical

event and its actual scientific implications, namely the accurate measurement of the solar diameter, with the astrophysical purposes of better knowing the solar behavior and the space climate.

The Carlo Pace Hall of Pescara ICRANet center was filled by people, with about 50 persons attending the meeting during all its unusual 7 hours length.

The registration of all the meeting is available now, in podcast, at the website of ICRANet: http://www.icranet.org/index.php?option=com_content&task=view&id=1264 at the bottom of the page. The program is available here: http://www.icranet.org/scuola_lavoro/2019-2020/11112019/programma.pdf

BETELGEUSE DIMMING MEETING

January 17, 2020, ICRANet Pescara

Costantino Sigismondi

After the success of the formula of Mercury Transit Meeting of 11 november 2019, we decided to organize a flash meeting on January 17, 2020, in the historical minimum of luminosity curve of Betelgeuse.

The aim of the organizer was to stress the point that this variable star has periodicities of years, and the timescale of gravitational collapse is tens of minutes.

The importance of Betelgeuse in the panorama of astronomical cultural heritage is paramount, but its nature as a naked-eye variable star is less known and absolutely not exploited to introduce students to the world of astronomical research and observations.

Among the convenors we had Margarita Karowska of Harvard CfA, Stella Kafka, AAVSO Director, Massimo Turatto and Cesare Barbieri of University of Padua, and Paolo Ochner of Asiago Astronomical Observatory.

In this meeting we spread the method of airmass correction, needed for comparing Betelgeuse with similar magnitude stars, which are angularly far from it. The airmass correction is feasible also with naked eye observations, with very interesting results in terms of accuracy, down to a centesimal of magnitudes.

The news that Betelgeuse variability was already known to ancient Greeks and to Australian aboriginal enforced us to study the possibility to improve our naked eye observations with this algorithm of airmass correction, in order to extend the months of fruitful observation even with the star low on the horizon.

The meeting lasted from 15 to 19 h ending with a public observation of Betelgeuse. The following day another public conference on Betelgeuse was offered in the Lyceum Galileo Galilei of Pescara among the "Science by Night" manifestation, reaching hundreds of people, thanks to the fact that Betelgeuse was, at that time, on all newspapers.

This meeting too was related to History of Astronomy context, and celebrated in the same spirit of Mercury and Gerbert's one.

The rapidity of the organization was due to the immediateness of the ongoing minimum of Betelgeuse, and -may be- the request of *Patrocinium* and the account of the meeting was not possible with the due calm.

The website of the Meeting is the following: http://www.icranet.org/index.php?option=com_content&task=view&id=1281.

GERBERTUS 2020 MEETING
The Moon of Gerbert

Costantino Sigismondi

This meeting is the XVIII of the series started on 12 May 2003, after 1000 years of the death of Gerbert of Aurillac, Sylvester II.

The 2020 formula of the meeting has been chosen as "podcast" to free people of a specific time slot that, even if limited, is difficult to find free for all conveners. The speakers had the opportunity to present their subjects at their ease, and the website has been "inaugurated" on May 7 at 13h UT, on the occasion of the full Moon classified as "supermoon," i.e. in perigee. The participants have accessed and are accessing the material available online.

Among the students of the schools invited to attend the meeting, about 100 of them returned essays on the themes suggested. The idea of a prize, the "Prize Mersenne"—dedicated to high school students for the best drawing of the Moon (with an unaided eye) with their description of the circumstances of the observation—is under implementation in the next lunar month.

The dedication of the prize to Marin Mersenne is because he believed strongly in the capacity of every human to repeat all experiments of other (once correctly instructed) and attaining the same intellectual milestones.

The special application to Moon drawing for this year is inspired by the theme of the Meeting Gerbert 2020, dedicated to the nature of the Moon as perceived one thousand years ago.

The website of the meeting is hosted and broadcasted by International Center for Relativistic Astrophysics and it is http://www.icranet.org/index.php?option=com_content&task=view&id=1317.

The contributions are dealing with the Moon, the Sun and the Climate History, provided that Gerbert's Letters allow us to understand the conditions of roads in Europe of 1000 years ago, and of the environment (e.g. the possibility to cross the Alps in late November). Also Cosmology and cosmological models, since Gerbert started to teach by using machineries of his own invention, have been discussed in the meeting, after an historical presentation of his biography, cultural and religious milieu.

The support of Lincei Italian Academicians to this meeting has been enthusiastic, and add to the organizers more reason of prestige, as well as the Aegis of IAU Commission C3, of the Athenaeum Regina Apostolorum Institute of Science and Faith and of the Sicilian Confreres, all bringing the Gerbert's Meetings to their maturity.

The Italian Ministry of Education recognizes the ICRANet (International Center for Relativistic Astrophysics Network) also as an Institution of Permanent Formation for teachers and students, and in this occasion the students of Galileo Galilei Lyceum of Pescara are completing their training time through the online edition of this meeting, thanks also to the possibility offered by the Academic Journal GERBERTVS to publish in online form and CD-Rom as well as in press with opportune ISSN numbers. This has been possible thanks to the extensive material gathered for this meeting, on which they are developing a careful editorial work.

In conclusion, the 2020 Gerbertus Meeting is successful also in the "podcast" form, and it allows many students to complete their work-training, for the editorial work required, under supervision of their teacher and of the researchers. The contributions to the meeting have been numerous and of high quality, and the first edition of the "Prize Mersenne" dedicated to Moon drawings & writings is being launched for high school students. A corner dedicated to Music, as in the "in person modality" is also present: the Mondscheinsonate of Ludwig van Beethoven reminds us of the 250th recurrence of his birth. Stefano Carciofalo Parisse, musician, contributed also with this masterpiece to our meeting. Gerbert was a musician as well and so this moment is also important and inherent to the meeting.

The "Prize Mersenne" has the patronage of IAU Commission C3, because of its historical strong roots.

Conversing about astronomy during the Vienna General Assembly. From left to right: Javier Mejuto (Honduras), Alejandro Lopez (Argentina), Steve Gullberg (USA), Duane Hamacher (Australia), and Rudiger Schultz (Austria).

Since Jay and Naomi Pasachoff (seated) and Wayne and Darunee Lingling Orchiston stayed at the same hotel in Vienna during the 2018 IAU General Assembly, history of astronomy was often on the breakfast menu!