



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

IAU inter-commission C1-C3-C4 working group on archaeoastronomy and astronomy in culture

Citation for published version:

Gullberg, S, Mejuto, J, Garcia, B, Hamacher, D, Holbrook, J, Lopez, AM, Ros, RM & Sterken, C 2023, 'IAU inter-commission C1-C3-C4 working group on archaeoastronomy and astronomy in culture: Triennial report, 2018– 2021', *Journal of Astronomical History and Heritage*, vol. 25, no. 2, pp. 311-317.
<https://doi.org/10.3724/SP.J.1440-2807.2022.02.12>

Digital Object Identifier (DOI):

[10.3724/SP.J.1440-2807.2022.02.12](https://doi.org/10.3724/SP.J.1440-2807.2022.02.12)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Publisher's PDF, also known as Version of record

Published In:

Journal of Astronomical History and Heritage

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



**IAU INTER-COMMISSION C1-C3-C4
WORKING GROUP ON ARCHAEOASTRONOMY
AND ASTRONOMY IN CULTURE:
TRIENNIAL REPORT, 2018–2021**

Steven Gullberg

*College of Professional and Continuing Studies, University of
Oklahoma, Norman, Oklahoma 73072, USA.
E-mail: srgullberg@ou.edu*

Javier Mejuto

*Archaeoastronomy and Cultural Astronomy, Universidad Nacional
Autonoma de Honduras, Tegucigalpa 11101, Honduras.
E-mail: javier.mejuto@unah.edu.hn*

Beatriz Garcia

*Instituto de Tecnologías en Detección y Astropartículas,
Azopardo 313, Godoy Cruz, Mendoza 5501, Argentina.
E-mail: beatrizgarciautn@gmail.com*

Duane Hamacher

*School of Physics, University of Melbourne, Melbourne 3010,
Victoria, Australia.
E-mail: duane.hamacher@unimelb.edu.au*

Jarita Holbrook

*Science, Technology & Innovation Studies, University of
Edinburgh, Edinburgh EH1 1LZ, United Kingdom.
E-mail: jc.holbrook@ed.ac.uk*

Alejandro Martin Lopez

*Instituto de Ciencias Antropológicas, Coleta Palacios 2087,
Moreno, Buenos Aires 1744, Argentina.
E-mail: astroamlopez@hotmail.com*

Rosa M. Ros

*Applied Mathematics IV, Universitat Politècnica de Catalunya,
Campus Nord Mod C3 UPC, Barcelona 08034, Spain.
E-mail: rosamariaros27@gmail.com*

and

Christiaan Sterken

*Physics Department, Vrije Universiteit Brussel, Pleinlaan 2,
1050 Brussels, Belgium.
E-mail: csterken@vub.ac.be*

1 INTRODUCTION

The WGAAC presently has 89 members (58 Working Group Members and 31 Working Group Associates). Our Working Group is interdisciplinary, and the Associates make valuable contributions from backgrounds in fields other than astronomy.

2 MEMBERSHIP

2.1 Working Group Members

Alan Alves-Brito (Brazil), Elio Antonello (Italy), Megan Argo (UK), G.S.D. Babu (India), Ennio Badolati (Italy), Juan Belmonte (Spain), Kai Cai (USA), John Carlson (USA), Brenda Corbin (USA), Milan

Dimitrijevic (Rep. Serbia), Steve Durst (USA), Marta Folgueira (Spain), Jesus Galindo-Trejo (Mexico), Alejandro Gangui (Argentina), Beatriz García (Argentina), Rita Gautschy (Switzerland), César González-García (Spain), Steven Gullberg (USA), Duane Hamacher (Australia), Abraham Hayli (France), Dieter Herrmann (Germany), Bambang Hidayat (Indonesia), Thomas Hockey (USA), Susanne Hoffmann (Germany), Jarita Holbrook (South Africa), Andrew Hopkins (Australia), Matthaïos Katsanikas (Greece), E.C. Krupp (USA), Ioannis Lirizis (Greece), Alejandro Lopez (Argentina), Claudio Mallamaci (Argentina), J. McKim Malville (USA), Javier Mejuto (Honduras), Areg Mickaelian (Armenia), Eugene Milone (Canada), Simon Mitton (UK), Andrew Munro (USA), Raymond Norris (Australia), Wayne Orchiston (Australia), Robert Preston (USA), Michael Rappenglück (Germany), Rosa Ros (Spain), Clive Ruggles (UK), Irakli Simonia (Republic of Georgia), Magda Stavinschi (Romania), Christiaan Sterken (Belgium), Linda Strubbe (USA), Woodruff Sullivan (USA), Virginia Trimble (USA), Ana Ulla (Spain), Johnson Urama (Nigeria), David Valls-Gabaud (France), Iryna Vavilova (Ukraine), Tiziana Venturi (Italy), Murli Verma (India), Gudrun Wolfschmidt (Germany), Georg Zotti (Austria).

2.2 Working Group Associates

Bryan Bates (USA), Patricio Bustamante (Chile), Nicholas Campion (UK), Brian Davis (USA), Margaret Davis (USA), Sona Farmanyan (Armenia), Roslyn Frank (USA), Robert Fuller (Australia), Cecilia Gomez (Argentina), Akira Goto (Japan), Liz Henty (UK), Stanislaw Iwaniszewski (Mexico), Olaf Kretzer (Germany), Trevor Leaman (Australia), Flavia Pedroza Lima (Brazil), Monica Martinez-Borravo (Mexico), Steve Miller (UK), Armando Mudrik (Argentina), Gregory Munson (USA), Cristina Negru (Romania), David Pankenier (USA), Emilia Pasztor (Hungary), Manuel Pérez-Gutiérrez (Spain), Eduardo Rodas (Honduras), William Romain (USA), John Saul (France), Fabio Silva (UK), Ivan Šprajc (Rep. Slovenia), Doris Vickers (Austria), Alexander Wolf (Russian Fed.), Mariusz Ziółkowski (Poland).

3 WG OBJECTIVES

The Working Group for Archaeoastronomy and Astronomy in Culture (WGAAC) is in part a discussion and collaboration group for IAU members regarding Astronomy in Culture, and as well for certain others with interests in these areas. A primary motivation is to facilitate interactions between researchers, but the WG also has significant interest in promoting education regarding cultural astronomy in all respects. The WGAAC is the focal point within the IAU for both vigorous research in the field of Astronomy in Culture and in public education for how astronomy has been used in many societies.

This field is also serviced by non-IAU organizations such as International Society for Archaeoastronomy and Astronomy in Culture (ISAAC), Société Européenne Pour L'Astronomie Dans La Culture (SEAC - European Society for Astronomy in Culture), Sociedad Interamericana de Astronomía Cultural (SIAC – Inter-American Society of Astronomy in Culture), and Society for Cultural Astronomy in the American Southwest (SCAAS). However, it is the IAU WGAAC that focuses on cultural astronomy within mainstream astronomy, and with its mission to:

- Advance the field of archaeoastronomy/cultural astronomy
- 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, ISAAC, SEAC, SIAC, and SCAAS 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

As well as facilitating internal interactions between the WGAAC and other IAU bodies, we strive as well to enhance strong links between the WGAAC and ISAAC, SEAC, SIAC, and SCAAS. The

WGAAC serves as a focal point for collaborative world-wide efforts in *Astronomy in Culture*.

4 TRIENNIAL WORK (2018–2021)

During the 2018-2021 triennium the WGAAC organized five committees for members to further its initiatives:

- Committee 1 – development of a comprehensive eBook 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. We anticipate this book will be ready for electronic publication by the end of 2021. The WGAAC plans for other books to follow.
- Committee 2 – development of initiatives for public outreach regarding Astronomy in Culture. We have begun this work and will add affiliation with Commission C2 to further the effort.
- Committee 3 – development of 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 are developing a compilation of such cultural information regarding this aspect of astronomy and are working toward additional educational initiatives as well.
- Committee 4 – development of 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. Commission C4 is a key affiliation here and we are in the process of compiling what is known.
- Committee 5 – development of 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 cultures and inspire them to include astronomy in their research and assessments. This committee has made good progress and continues its efforts.

Archaeoastronomy, a major part of cultural astronomy, very much relates to Commission C3 and C3 influences much of the above activity. The work of these committees is ongoing, and this will make important contributions to the growing field of Astronomy in Culture. The IAU through its WGAAC will continue to exert great influence on the further evolution of the field.

Significantly, we have now formed a 6th committee. In November 2020 the WGAAC was tasked with leading a joint collaborative initiative with the Royal Astronomical Society in the United Kingdom, and this was joined by the American Astronomical Society. The initiative addresses cultural sensitivities at world astronomical sites. Goals of the effort include developing a program to better educate astronomers as to Indigenous concerns, developing materials that will provide insightful information to the public, and developing information that can be used proactively when future observatory sites are considered. Work is well underway, and the team plans to offer workshops in 2021 and 2022 at major astronomical events of the IAU, the RAS, and the AAS. This will be an ongoing project and presentations are anticipated at other astronomy events as well. IAU members presently serving on the joint committee are: Steven Gullberg (Chair, USA), Megan Argo (UK), Rick Fienberg (USA), Duane Hamacher (Australia), Jarita Holbrook (South Africa), Alejandro Lopez (Argentina), Javier Mejuto (Honduras), Wayne Orchiston (Australia), Rosa Ros (Spain), Oana Sandu (Germany), and Gudrun Wolfschmidt (Germany). WGAAC Working Group Associate Steve Miller (UK) serves on the committee as well.

During this triennium several WG members worked to advance cultural astronomy education through degree programs and courses that they created at their universities.

5 RESEARCH

The WGAAC encourages research and publication regarding Astronomy in Culture. WG members have prolifically published during the 2018-2021 triennium – a still growing list includes over 240 books and papers. In the following Section we list examples of publications from our members and other IAU members involved in research in Astronomy in Culture. Names of WG members are shown in bold print.

6 PUBLICATIONS

Belmonte J.A., Gheorgiu, D., Nash, G., Bender, H., **Pasztor, E.**, 2019. Essay review on Land of the Shamans: archaeology, cosmology and landscapes *Journal for the History of Astronomy* 50, 482–483.

- Boutsikas, E., McCluskey, S.C., and Steele, J. (eds.), 2021. *Advancing Cultural Astronomy: Studies in Honour of Clive Ruggles*. Cham, Springer.
- Campion, N.**, and Impey, C. (eds.), 2018. *Imagining Other Worlds: Explorations in Astronomy and Culture*. Lam-peter, Sophia Centre Press.
- Campion, N.**, 2020. *The Archaeology of Cultural Astronomy: Material Culture, Astronomy and Power*. Oxford, British Archaeology Reports.
- David, B., and **Hamacher, D.W.**, 2019. Environment and landscape. In Lopez Varela, S.L. (ed.), *The Encyclopedia of Archaeological Sciences*, John Wiley & Sons.
- Di Paolo, A., and **Gangui, A.**, 2018. Estudio arqueoastronómico de las iglesias históricas de La Gomera. *Anales Asociación Física Argentina*, 29(3), 62–68 <https://doi.org/10.31527/analesafa.2018.29.3.62>
- Di Paolo, A., **Gangui, A.**, **Belmonte, J.A.**, and Perera Betancort, M.A., 2020. Cuando la ortodoxia no es lo más relevante: el paisaje de La Gomera y la orientación de sus Iglesias. *Cosmovisiones/Cosmovisões*, 1(1), 73–88.
- Dick, S.J., 2019. *Classifying the Cosmos: How We Can Make Sense of the Celestial Landscape*. Cham (Switzerland), Springer.
- Dimitrijević, M.S.**, 2019. Milutin Milanković and the reform of Julian Calendar on Ecumenical Congress in Constantinople in 1923. In Slavko Maksimović, S. (ed.), *International Conference. The Life and Work of Milutin Milanković: Past, Present, Future, 19–21 July 2019, Belgrade*. Belgrade, Faculty of Architecture. Pp. 87–92.
- Farmanyan, S.V.**, **Mickaelian, A.M.**, **Malville, J.McK.**, and Bagheri, M. (eds.), 2019. *Astronomical Heritage of the Middle East*. San Francisco, Astronomical Society of the Pacific (ASP Conference Series, Volume 520).
- Frank, R.M.**, 2018. Collective social memory as manifest in skyscape narratives. *Journal of Skyscape Archaeology*, 4(1), 124–128.
- Gabler, K., **Gautschy, R.**, Jenni, H., Reymond, C., and Bohnenkämper, L. (eds.), 2020. *Text-Bild-Objekte im archäologischen Kontext. Festschrift für Susanne Bickel*. Hamburg, Widmaier Verlag (Lingua Aegyptia – Studia Monographica).
- Gamarra, M.R., **Gullberg, S.R.**, Estrázulas, M., Horvath, J., and Zen Vasconcellos, C.A., 2019. Complementary duality of the Inca's cosmovision: an astrophysics perspective. *Astronomische Nachrichten*, 340, 817–827.
- Gamarra, M.R., **Gullberg, S.R.**, Estrázulas, M., Horvath, J., and Zen Vasconcellos, C.A., 2021. Inka's cosmovision, space, time, and cosmos: a Western perspective. *Astronomische Nachrichten*, 342, 31–38.
- Gangui, A.**, and **Belmonte, J.A.**, 2018. The development of a utopian city? Comparing land- and skylscapes in Santa Cruz de Tenerife and San Cristóbal de la Laguna. *Mediterranean Archaeology and Archaeometry*, 18 (4), 53–57.
- Gangui, A.**, and **Belmonte, J.A.**, 2018. Urban Planning in the first unfortified Spanish colonial town: the orientation of the historic churches of San Cristóbal de La Laguna. *Journal of Skyscape Archaeology*, 4(1), 6–25 <https://doi.org/10.1558/jsa.34336>
- Gangui, A.**, Lastra, C., and Karaseur, F., 2018. On times and shadows: the observational analemma. *The Physics Teacher*, 56(6), 367–369 doi.org/10.1119/1.5051148
- Gangui, A.**, 2020. De tauroctonías y estrellas: mitra y la vida de una imagen. *MODOS. Revista de História da Arte*, 4(3), 247–263.
- Gangui, A.**, 2020. La polémica del multiverse. *Anales Asociación Física Argentina*, 30(4), 72–78 doi.org/10.31527/analesafa.2019.30.4.72
- Gangui, A.**, 2020. The orientation of Jesuit churches in the Chiquitos missions of eastern Bolivia. *Journal of Skyscape Archaeology*, 6(2), 159–181 doi.org/10.1558/jsa.19631
- Gangui, A.**, and Ortiz, E.L., 2020. El físico Enrique Loedel Palumbo en el corredor científico Montevideo-Buenos Aires-La Plata: 1920–1930. *Revista de Indias*, 80(280), 815–846 <https://doi.org/10.3989/revindias.2020.023>
- Gangui, A.**, 2021. *Tensión Cósmica: La Energía Oscura y la Evolución del Universo*. Buenos Aires, Eudeba, E-book. <https://www.eudeba.com.ar/E-book/9789502331577/Tensión+cósmica>
- Gautschy, R.**, 2020. The Karnak Clepsydra: votive gift or utilitarian object? In Gabler, K., **Gautschy, R.**, Jenni, H., Reymond, C., and Bohnenkämper, L. (eds.), *Text-Bild-Objekte im archäologischen Kontext. Festschrift für Susanne Bickel*. Hamburg, Widmaier Verlag (Lingua Aegyptia – Studia Monographica). Pp. 171–183.
- González García A.C.**, and **Belmonte, J.A.**, 2019. Lunar standstills or lunastices, reality or myth? *Journal of Skyscape Archaeology*, 5(2), 177–190.
- Goto, A.**, 2018. House and burial orientations of the Hokkaido Ainu, indigenous hunter-gatherers of northern Japan. *Mediterranean Archaeology and Archaeometry*, 18(4), 173–180.
- Gullberg, S.R.**, 2019. Inca astronomy: horizon, light and shadow. *Astronomische Nachrichten*, 340, 23–29.
- Gullberg, S.R.**, 2019. Cultural astronomy and educational opportunities. *Astronomische Nachrichten*, 340, 810–816.
- Gullberg, S.R.**, 2020. *Astronomy of the Inca Empire: Use and Significance of the Sun and the Night Sky*. Cham (Switzerland), Springer.
- Gullberg, S.R.**, 2021. Astronomy of the Inca Empire. In Schultz, G., Barnes, J., Fraknoi, A., and Shore, L. (eds.), *ASP2020: Embracing the Future: Astronomy Teaching and Public Engagement. Proceedings of a Virtual Conference held 3 December 2020*. San Francisco, Astronomical Society of the Pacific (ASP Conference Series, Vol. 531). Pp. 250–260.
- Gullberg, S.R.**, 2021. Cultural astronomy for inspiration. In **Rosa et al.**, 265–268.
- Gullberg, S.R.**, and Layser, C., 2021. Archaeoastronomy of Teotihuacan and Tenochtitlan. *Astronomische Nachrichten*, 342(1-2), 39–44.

- Hamacher, D.W.**, Tapim, A., Passi, S., and Barsa, J., 2018. Dancing with the stars: astronomy and music in the Torres Strait. In **Campion, N.**, and Impey, C. (eds.), *Imagining Other Worlds: Explorations in Astronomy and Culture*. Sophia Centre Press. Pp. 151–161.
- Hamacher, D.W.**, **Fuller, R.S.**, **Leaman, T.M.**, and Bosun, D., 2020. Solstice and solar position observations in Australian Aboriginal and Torres Strait Islander traditions. *Journal of Astronomical History and Heritage*, 23(1), 89–99.
- Heller, F., Broes, F., and **Zotti, G.**, 2020. Linsmeau Early Bronze Age structure showing a possible astronomical intent. In **Henty** and Brown, 135–157.
- Henty, L.**, 2020. Skyscape archaeology: the place of the sky in the academy. In **Henty** and Brown, 13–34.
- Henty, L.**, and Brown, D. (eds), 2020. *Visualising Skyscapes: Material Forms of Cultural Engagement with the Heavens*. Oxford, Routledge.
- Herrmann, D.B.**, 2019. *Atlas Astronomischer Traumorte: Entdeckungsreisen auf den Spuren der Sternkunde*. Stuttgart, Franckh-Kosmos.
- Hockey, T.**, 2020. Archaeoastronomy sites of the USA: likelihood of preservation. *Bulletin of the American Astronomical Society*, 52.
- Hoffmann, S.**, 2021. Historical constellations in the planetarium. In **Ros** et al., 474–475.
- Holbrook, J.C.**, 2019. The Square Kilometre Array Art Exhibition. In Henty and Brown, 200–215.
- Khairunnisa, S.A., Hidayat, T., **Orchiston, W.**, and Nikeu, N., 2021. Astronomical aspects of the Prambanan Temple of Central Java, Indonesia. In **Orchiston, W.**, and Vahia, M. (eds.), *Exploring the History of Southeast Asian Astronomy: A Review of Current Projects and Future Prospects and Possibilities*. Cham, Springer. Pp. 487–502.
- Liritzis, I.**, Laskaris, N., Vafiadou A., Karapanagiotis I., Volonakis, P., Papageorgopoulou, C., and Bratitsi, M., 2020. Archaeometry: an overview. *Scientific Culture*, 6(1), 49–98. doi: 10.5281/zenodo.3625220
- López, A.M.**, 2018. Interculturalidad y educación astronómica: Perspectivas desde el Chaco argentino. In Ros, R.M., Belmonte, J.A., and Fabregat, J. (eds.), *Calidoscopio NASE de Experiencias en Astronomía Cultural. Arqueoastronomía y Astronomía en la Ciudad, Actas del Segundo Seminario Sobre Experiencias de NASE en Astronomía Cultural*, Vienna, Austria, International Astronomical Union, Network for Astronomy School Education. Albedo FullDome. Pp. 58–64.
- López, A.M.**, 2018. Peoples knocking on Heaven’s doors: conflicts between international astronomical projects and local communities. *Mediterranean Archaeology and Archaeometry*, 18(4), 439–446.
- López, A.M.**, 2020. Cultural astronomy perspectives on ‘development’. In Lago, M.T., (ed.), *Astronomy in Focus. As Presented at the IAU XXX General Assembly, 2018*. Cambridge, Cambridge University Press. Pp. 580–581.
- López, A.M.**, 2020. La batalla por el cielo: reacciones públicas contemporáneas de la comunidad científica argentina al Terraplanismo. *Cosmovisiones/Cosmovisões*, 2(1), 93–127.
- López, A.M.**, 2020. Problematizando el concepto de ‘observación astronómica’. *Revista Cosmovisiones / Cosmovisões*, 1(1), 17–51.
- López, A.M.**, 2021. Astronomies, cultures and education. In Bhandare, A., Giobbi, G., Larkin, C., Sanderson, R., Penteado, E., Deacon, N., Sanderson, G., and Sippel, A. (eds.), *Proceedings for the 3rd Shaw-IAU Workshop on Astronomy for Education. What Everybody Should Know about Astronomy Education*, Heidelberg, Max Planck Institute for Astronomy (Publications of the IAU Office of Astronomy for Education of the International Astronomical Union). Pp. 296–298.
- López, A.M.**, 2021. Cosmovisión y cosmología. Fundamentos histórico-metodológicos para un uso articulado. *Revista Cosmovisiones / Cosmovisões*, 3(1), 65–115.
- López, A.**, 2021. Cultural astronomy: a scientific frame to understand academic astronomy as part of the social world. In **Ros** et al., 235–244.
- López, A.M.**, 2021. Sobre torbellinos y otros aires. Vientos y poder entre los guaycurú del Chaco. In Iwaniszewski, S., Vasconcellos, R.M., and Gilewski, M. (eds.), *La Vida Bajo el Cielo Estrellado: la Arqueoastronomía y Etnoastronomía en Latinoamérica*. Varsovia, Editorial de la Universidad de Varsovia. Pp. 275–286.
- Magli, G., **Gonzalez-Garcia, A.C.**, and **Belmonte Aviles, J.A.** (eds.), 2019. *Archaeoastronomy in the Roman World*. Cham (Switzerland), Springer.
- Malville, J.McK.**, 2019. Environmental and societal determinants of ancient astronomies. In **Farmanyan** et al., 17–25.
- Mejuto, J.**, and Rodas-Quito, E., 2019. Etnoastronomía en Honduras: Retos y desafíos in *Libro de resúmenes del I Congreso de Investigación en Ciencias Espaciales*. Tegucigalpa, Universidad Nacional Autónoma de Honduras.
- Mickaelian, A.M.**, and **Farmanyan, S.V.**, 2019. *Armenian Archaeoastronomy and Astronomy in Culture*. San Francisco, Astronomical Society of the Pacific (Conference Series 520).
- Mudrik, A.**, 2020. Luna e identidad entre migrantes europeos y sus descendientes en el sur de la región chaqueña argentina. *Avá*, 35, 181–212.
- Munson, G.E.**, Williamson, R.A., and **Bates, B.C.** (eds.), 2020. *Before Borders: Revealing the Greater Southwest’s Ancestral Cultural Landscape*. Dolores, Multimedia Publications (SCAAS Occasional Papers on Cultural Astronomy, No. 1).
- Muratore, M.F., and **Gangui, A.**, 2020. Archaeoastronomical study of Christian churches in Fuerteventura. *Bulletin of the Argentine Astronomical Society*, 62, 301–303.

- Ôhashi, Y., and **Orchiston, W.**, 2021. Local Southeast Asian astronomy and the influence of China, India, the Islamic World and the West. In **Orchiston, W.**, and **Vahia, M.** (eds.), *Exploring the History of Southeast Asian Astronomy: A Review of Current Projects and Future Prospects and Possibilities*. Cham, Springer. Pp. 673–767.
- Orchiston, W.**, 2019. The IAU C41 Working Groups and their contribution to international history of astronomy research. In **Sterken** et al., 332–356.
- Orchiston, W.**, **Sule, A.**, and **Vahia, M.** (eds.), 2019. *The Growth and Development of Astronomy and Astrophysics in India and the Asia–Pacific Region: ICOA-9, Pune, India, 15–18 November 2016*. New Delhi, Hindustan Book Agency and Springer Singapore.
- Orchiston, W.**, **Guido, R.**, **Bautista, R.A.**, **Dela Crux, R.A.**, **Torres, J.**, and **Orchiston, D.L.**, 2021. Exploring the history of Philippine astronomy: Catholics, comets, eclipses and ethnoastronomy. In **Orchiston** and **Vahia**, 37–115.
- Orchiston, W.**, and **Vahia, M.** (eds.), 2021. *Exploring the History of Southeast Asian Astronomy: A Review of Current Projects and Future Prospects and Possibilities*. Cham (Switzerland), Springer.
- Orchiston, W.**, and **Vahia, M.**, 2021. Exploring the history of Southeast Asian astronomy: a checklist of recent research and future prospects and possibilities. In **Orchiston** and **Vahia**, 3–36.
- Pankenier, D.**, 2019. Parallel planetary astrologies in Medieval China and Inner Asia. *International Journal of Divination and Prognostication*, 1(2), 157–203.
- Pankenier, D.W.**, 2020. A brief account of three millennia of Chinese preoccupation with the skyscape. In **Henty** and **Brown**, 216–225.
- Pasztor, E.**, 2020. Visualisation of the sky in traditional cultures of Eurasia and its ancient representations. In **Henty** and **Brown**, 177–199.
- Pérez-Fernández, E.**, **Martínez García, B.**, **Braña-Rey, F.**, and **Ulla-Miguel, A.**, 2020. O ceo na pedra. Un proxecto de innovación educativa para o Ensino Secundario, no eido da astronomía cultural. Xornadas de Educación Patrimonial de Galicia, III.
- Rappenglück, M.A.**, 2020. Capturing heaven and Earth by counting, measuring and constructing: the prehistory of mathematics, metrology and astronomy in the Paleolithic. In **Wolfschmidt**, 88–126.
- Rodríguez Díaz, A.**, **Pérez Gutiérrez, M.**, and **Duque Espino, D.M.**, 2019. “Estrechando el círculo” de la fornacis de ptolemeo: el oppidum de hornachuelos (ribera del fresno, badajoz) / “Narrowing the circle down” of ptolemy’s fornacis: the oppidum of hornachuelos (ribera del fresno, badajoz). *Conimbriga, Revista do Instituto de Arqueologia*, No. 58.
- Romain, W.**, 2020. Subduing the demons of Tibet: geomantic magic during the Yarlung Dynasty: a landscape archaeology assessment. *Time and Mind: The Journal of Archaeology, Consciousness and Culture*. 14(1), 33–71.
- Ros, R.**, **García, B.**, **Gullberg, S.**, **Moldón, J.**, and **Rojo, P.** (eds.), 2021. *Education and Heritage in the Era of Big Data in Astronomy: The First Steps of the IAU 2020–2030 Strategic Plan. Proceedings of the Virtual Meeting held 8–12 December, 2020*. Cambridge, Cambridge University Press.
- Ruggles, C.**, 2019. Beyond Jodrell Bank: astronomical heritage. *Astronomy & Geophysics*, 60(4), 4.36–4.39.
- Saelee, C.**, **Riyaprao, O.**, **Komonjinda, S.**, and **Sriboonrueang, K.**, 2021. An archaeoastronomical investigation of *Vaastu Shastra* principles (Vedic Architecture) implemented in the city planning of ancient Chiang Mai. In **Orchiston** and **Vahia**, 461–485.
- Saul, J.M.**, 2020. Comment la mythologie permet de dater la préhistoire. *Bulletin Trimestriel du Group Ile-de-France de Mythologie Française*, 114 (June), 9–15.
- Sauter, J.**, **Simonia, I.**, and **Orchiston, W.**, 2021. Cultural and historical astronomy in a brontologion from Georgia. *Journal of Astronomical History and Heritage*, 24(4), 1001–1016.
- Savchuk, V.S.**, **Kushlakova, N.M.**, **Vavilova, I.B.**, and **Kibalchich, N.**, 2019. In the history of world rocket space technics: discussion questions of domestic and world historiography. *Space Science and Technology*, 25(6), 70–83.
- Schaefer, B.E.** and **Stamm, J.**, 2020. A case study of the Picture Rocks sun dagger, plus a review of the intentionality of sun daggers. *Journal of Astronomical History and Heritage*, 23(3), 427–451.
- Silva, F.**, 2020. A probabilistic framework and significance test for the analysis of structural orientations in skyscape archaeology. *Journal of Archaeological Science*, 118, 105–138.
- Silva, F.**, 2020. On measurement, uncertainty and maximum likelihood in skyscape archaeology. In **Henty** and **Brown**, 55–74.
- Simonia, I.**, 2019. Ancient astronomical knowledge: the unity of diversity. In **Farmanyan** et al., 59–70.
- Simonia, T.**, and **Simonia, I.**, 2019. Digital projection of ancient astronomical heritage. **Farmanyan** et al., 127–132.
- Sixto, G.B.**, **López, A.M.**, and **Mudrik, M.G.**, 2018. Churches orientations in the Jesuits missions among Guarani people. *Mediterranean Archaeology and Archaeometry*, 18(4), 165–171.
- Šprajc, I.**, 2019. Lunar orientations in the Maya architecture. In **Kováč, M.**, **Kettunen, H.**, and **Krempel, G.** (eds.), *Maya Cosmology: Terrestrial and Celestial Landscapes*. Munich, A. Saurwein (*Acta Mesoamericana*, 29, 27–44).
- Sterken, C.**, 2019. Bruegel’s winter landscapes: some reflections on climate change. *Archives et Bibliothèques de Belgique*, 90, 63–89.
- Sterken, C.**, 2019. Some thoughts on stellar constellations in petroglyphs. *American Indian Rock Art*, 45, 83–88.
- Sterken, C.**, **Hearnshaw, J.**, **Valls-Gabaud, D.**, 2019. *Under One Sky: the IAU Centenary Symposium*. Cambridge, Cambridge University Press (IAU Symposium 349).

- Sterken, C.**, 2021. Bronze Age rock art and 20th-century oil-on-canvas impressions of constellation Crux, the Southern Cross. In **César González-García, A., Frank, R.M., and Sims, L.D., Rappenglück, M.A., Zotti, G., Belmonte, J.A., and Sprajc, I.** (eds.), *Beyond Paradigms in Cultural Astronomy. Proceedings of the 27th SEAC Conference Held Together With the EAA*. Oxford, BAR Publishing. Pp. 153–158.
- Trimble, V.**, 2019. International cooperation in astronomy before the IAU. In **Sterken et al.**, 228–233.
- Urama, J.**, 2021. The African Cultural Astronomy Project: the hidden treasure. AFAS2 2021: Conference of the African Astronomical Society, held 08–12 March, 2021 virtually, id.81.
- Vavilova, I.**, and Artemenko, T.G., 2021. The oldest astronomical observatories in Ukraine. In **Ros et al.**, 484–486.
- Wolfschmidt, G.** (ed.), 2020. *Maß und Mythos, Zahl und Zauber: Die Vermessung von Himmel und Erde. Measure and Myth, Number and Magic: Measuring Heaven and Earth. Proceedings der Tagung der Gesellschaft für Archäoastronomie in Dortmund 2018*. Hamburg, Tredition (Nuncius Hamburgensis - Beiträge zur Geschichte der Naturwissenschaften 48).
- Wolfschmidt, G.**, 2021. Cultural Heritage of observatories in context with the IAU–UNESCO Initiative: highlights in the development of architecture. In Boutsikas, E., McCluskey, S.C., and Steele, J. (eds.), *Advancing Cultural Astronomy: Studies in Honour of Clive Ruggles*. Cham, Springer. Pp. 291–314.
- Ziółkowski, M.**, 2020. The Moon and planets among the Inca and in the Andes. In Read, P., de Dalmau, J., Fegley, B., Freeland, S., Jackman, C., Jin, S., Krupp, E.C., Lewis, S., Michalski, J., Rugheimer, S., Van Hoolst, T., Westall, F., and Zakharov, A. (eds.), *The Oxford Research Encyclopedia of Planetary Science*. Oxford, Oxford University Press.
- Zotti, G.**, 2020. Visualising skiescapes: GIS-based 3-D modelling and astronomical simulation. In **Henty and Brown**, 35–54.
- Zotti, G.**, and Muzaffari, S.M., 2020. New light on the main instrument of the Samarqand Observatory. *Journal for the History of Astronomy*, 51(3), 255–271.
- Zotti, G.**, 2021. Stellarium: simulation for research and outreach. In Ros, R., Garcia, B., Gullberg, S., Moldón, J., and Rojo, P. (eds.), *Education and Heritage in the Era of Big Data in Astronomy: The First Steps on the IAU 2020–2030 Strategic Plan*. Cambridge, Cambridge University Press. Pp. 95–104.

7 IN MEMORIUM

We will deeply miss our friend and colleague, William Liller (Chile), who recently passed in 2021.

8 CLOSING REMARKS

The WGAAC and its members had a very productive triennium as work continued during the present pandemic. The joint initiative between the IAU, RAS, and AAS is exciting and the Committee looks forward to seeing its efforts improve mutual understanding. The WG's other committees continue fascinating work as well. The WG's first eBook to be published later this year will be a banner achievement and a major contribution. The WG will actively explore all aspects of Astronomy in Culture and will promote educational public outreach initiatives. A primary goal is to help educators to learn aspects of cultural astronomy and then use this to inspire students at all levels to pursue endeavors in science. The field of Astronomy in Culture has reached a stage of increased momentum in its evolution and advancement. The IAU and its WGAAC will continue to play a central role in guiding the further development of and education for this field that is integral to the history of astronomy.