

東方天文學史國際會議
議會際國史學天文洋東

Mapping the Oriental Sky

Proceedings of the Seventh International Conference on
Oriental Astronomy (ICOA-7)

Edited by

Tsuko NAKAMURA, Wayne ORCHISTON, Mitsuru SÔMA & Richard STROM



Held on September 6 – 10, 2010

National Astronomical Observatory of Japan

Mitaka, Tokyo



ICOA-7 group photo at NAOJ Auditorium (8 September, 2010)

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PREFACE

These proceedings, edited by the undersigned four editors, consist of papers which were presented at the Seventh International Conference on Oriental Astronomy (ICOA-7) held at the National Astronomical Observatory of Japan, Mitaka near Tokyo, during September 6-10, 2010, and refereed by members of the scientific organizing committee of the conference. The International Conference on Oriental Astronomy (ICOA) was initially proposed by Professor Emeritus Nha Il-Seong (Yonsei University, Korea), in collaboration with Professor Richard Stephenson (Durham University, Britain), and the first meeting was held at Yonsei University, Seoul, on October 6-11, 1993.

The primary purpose of the ICOA was to inspire studies on the history of astronomy in Asian countries and to encourage mutual communication and collaboration between researchers in an international context; scholastic activities in this discipline had until then been conducted mainly on a domestic scale. Another aim of the ICOA was to collaborate with Western researchers who studied Asian history of astronomy. Although it is not clear whether the second meeting was clearly born in mind by the organizers at the time of the Seoul meeting, the ICOA has since then been held regularly, usually triennially, during the past 18 years, up to the ICOA-7. It is also noted that each ICOA has published its official proceedings, including that for the ICOA-6 which is now in print as one of the Astrophysics and Space Science Proceedings series at Springer Verlag.

Following is a short summary of the past ICOA meetings: the second meeting, ICOA-2, was held at Yingtan, China in 1995; ICOA-3 was at Fukuoka in 1998, hosted by Professor Hirai of Fukuoka University of Education; ICOA-4 at Nanyang, China in 2001; ICOA-5 at Chiang Mai, Thailand in 2004, hosted by Professor Soonthornthum of Chiang Mai University; and ICOA-6 at James Cook University, Townsville, Australia in 2008, hosted by Associate Professor Wayne Orchiston. The contents of all of these meetings can be seen on the ICOA website, NAOJ (*).

Reflecting the time elapsed during the past two decades, the ICOA seems to have gradually changed its nature. In the ICOA-1 and ICOA-2, the main themes of the conferences had focused on astronomy, calendar-making, observatories and instruments, and astronomical records of the ancient and medieval eras. The regions discussed were limited to China, Korea, India, and the Arabic/Islamic world, and the presented talks primarily treated subjects on the pre-telescopic times. In the ICOA-3, -4 and -5, the conference topics widened in terms of both the covered time periods and geographical locations, to include mathematical aspects of calendrical sciences, astronomy of Japan, Australia and Thailand, ethno- and archaeo-astronomy, and solar eclipse expeditions. The ICOA-6 held at Townsville, Australia, was special in that it further encompassed themes relating to the history of Asian and Pacific Rim astronomy, and included astrophysics, and the history of radio astronomy down to the times of post-WW II.

At the ICOA-6 meeting in 2008, the ICOA Executive Committee recommended to have the next meeting in Tokyo. As a result, Tsuko Nakamura and Mitsuru Sōma respectively agreed to act as chairmen of the Science Organizing Committee and the Local Organizing Committee for the ICOA-7. Mitaka campus of the National Astronomical Observatory of Japan (NAOJ) near Tokyo was selected as the conference venue, because it is the national center of astronomy in Japan, and also has a long history of its own since 1887. About one and a half years before the Mitaka meeting, the Internet website for the ICOA was launched on an NAOJ computer server by Sōma and Nakamura, intended for ICOA-7 announcements and providing links to relevant homepages. It was at that moment that the logotype written in ancient Chinese characters and meaning the name of this conference was adopted after discussion between some Japanese and Chinese researchers (the logo is shown on the front cover of these proceedings).

The summer of 2010 was abnormal in that at many cities in Japan unprecedented high temperatures were recorded, probably due to global warming caused by human activity, and the terrible heat continued till the ICOA-7 meeting. In spite of these unfavorable conditions, many researchers from all over the world got together at the NAOJ auditorium during September 6-9, 2011. The breakdown of the total number of participants was as follows: 13 from Korea; 5 from India; 3 from China; 2 each from Indonesia, Iran and Australia; 1 each from Uzbekistan, Thailand, France and Netherlands; and 25 from Japan. Since the majority of the participants presented their papers at the meeting, the ICOA-7 was really worth being called an international conference. The presented papers consisted of 12 invited papers, 29 ordinary talks and 24 poster papers.

Compared with past ICOA meetings, it seems that the ICOA-7 provided the widest variety of topics ever, ranging from archaeoastronomy through to modern astrophysics. For instance, there were several reports on megalithic and stone-circle astronomy from prehistoric India, Korea, Japan and Europe. In addition, papers on astronomy relating to culture, ethnology and climatology were presented, which were uncommon at past meetings.

On the other hand, this conference was characterized by numerous reports on modern astronomy and astrophysics achieved up to the times after World War II. Among these were poster papers by Australian astronomers and papers on developments in radio and optical astronomy in Japan. It was also impressive to see that young researchers and graduate students from Korea, Iran and Indonesia made lively presentations on their research. The long lunch breaks of one and a half hours helped promote mutual exchanges of information and active discussion.

As the last event of the conference, a full-day bus tour to the Nobeyama Radio Observatory and the Gishodo Clock Museum at Suwa city of Nagano Prefecture was held on 10 September. All of the delegates enjoyed the trip to this mountainous and rural area, escaping from the urban summer heat for a while.

We hope that these proceedings will serve as a good guide in overviewing the status quo of studies on the history of Asian astronomy.

Finally, we very much appreciate the financial support given to the ICOA-7 by the NAOJ and the Japanese Foundation for Promotion of Astronomy. Thanks are also due to NAOJ staff K. Sekiguchi, F. Yoshida, M. Goto and H. Mikoshiba, whose cooperation was very helpful in preparing the meeting and ensuring that it ran smoothly. Publication of this book was financially supported by the Japan Society for the Promotion of Science, grant No. 22500963.

June 30, 2011

Tsuko Nakamura (Teikyo-Heisei University, Japan)
Wayne Orchiston (James Cook University, Australia)
Misturu Sōma (National Astronomical Observatory of Japan)
Richard Strom (Dwingeloo Radio Observatory, Netherlands)

(*) <http://optik2.mtk.nao.ac.jp/~somamt/ICOA-website/ICOA-index.html>

Conference Participants

Ahn, Sang-Hyeon (Korea Astronomy and Space Science Institute, Korea)
Akbari, Marjan (Sendai, Japan)
Akhlaghi, Mohammad (Tohoku University Astronomical Institute, Japan)
Ansari, Shaukat N. (Aligarh Muslim University, India)
Ansari, S.M. Razaullah (Aligarh Muslim University, India)
Choi, Go Eun (Korea Astronomy and Space Science Institute, Korea)
Débarbat, Suzanne (SYRTE, Observatoire de Paris, France)
Ehgamberdiev, Shuhrat (Ulugh Beg Astronomical Institute of the Uzbek Academy of Sciences, Uzbekistan)
Fujiwara, Tomoko (Kyushu University, Japan)
Hariawang, Irma Indriana (Institute of Technology Bandung, Indonesia)
Hayashi, Masahiko (The University of Tokyo, Japan)
Hidayat, Bambang (Indonesian Academy of Sciences, Indonesia)
Hirai, Masanori (Fukuoka University of Education, Japan)
Hirose, Sho (Kyoto Sangyo University, Japan)
Hosoi, Hiroshi (Kwassui Women's College, Japan)
Hurukawa, Kiiro (former staff member of National Astronomical Observatory of Japan, Japan)
Hwang, Imsoon (Mrs. Oh, Kyungnam, Korea)
Ikeda, Meika (Waseda University, Japan)
Ito, Setsuko (former staff member of National Astronomical Observatory of Japan, Japan)
Jochi, Shigeru (Osaka Kyoiku University, Japan)
Jun, Yong Hoon (Kyujianggak Institute for Korean Studies, Korea)
Kuromi, Eri (Waseda University, Japan)
Kim, Sang-hyuk (Basic Science Research Institute, Korea)
Kinoshita, Hiroshi (National Astronomical Observatory of Japan, Japan)
Lee, Eun Hee (Konkuk University, Korea)
Lee, Ki-Won (Korea Astronomy and Space Science Institute, Korea)
Lee, Yong Bok (Seoul National University of Education, Korea)
Li, Liang (University of Science and Technology of China, China)
Lu, Lingfeng (University of Science and Technology of China, China)
Matsuura, Kiyoshi (Osaka Institute of Technology, Japan)
Maeder, Stefan (Kokugakuin University, Japan)
Menon, Srikumar M. (Manipal Institute of Technology, India)
Mihn, Byeong-Hee (Korea Astronomy and Space Science Institute, Korea)
Nakamura, Michiko (Gakken Co., Japan)
Nakamura, Tsuko (Teikyo-Heisei University, Japan)
Nakayama, Shigeru (Kanagawa University, Japan)
Nam, Moon-Hyon (Konkuk University, Korea)
Naruke, Tetsuro (Daito Bunka University, Japan)
Nha, Il-Seong (Yonsei University and The Nha Il-Seong Museum of Astronomy, Korea)
Normile, Dennis (Science Japan Bureau, Japan)
Oh, Gilsun (Hwachon Plant, Korea)
Ôhashi, Yukio (Shibuya-ku, Tokyo, Japan)
Okazaki, Akira (Gunma University, Japan)
Orchiston, Wayne (James Cook University, Australia)
Ozawa, Kenji (Anhui Normal University, Japan)
Qu, Anjing (Northwest University, China)
Renshaw, Steven (Kanda University of International Studies, Japan)
Saijo, Keiichi (National Museum of Science and Nature, Japan)
Sarma, U K V (Indian Institute of Technology Bombay, India)
Shiraishi, Masato (Zhongguo Yanjiusuo, Japan)
Sôma, Mitsuru (National Astronomical Observatory of Japan, Japan)
Sôma, Ririka (Gakushuin University, Japan)
Sôma, Sayaka (Waseda University, Japan)
Soonthomthum, Boonrucksar (National Astronomical Research Institute of Thailand, Thailand)
Stewart, Ron (James Cook University, Australia)
Strom, Richard (ASTRON, Netherlands)
Tajima, Toshiyuki (National Astronomical Observatory of Japan, Japan)
Tanikawa, Kiyotaka (National Astronomical Observatory of Japan, Japan)
Tanokura, Mizuho (Gunma University, Japan)
Vahia, Mayank N. (Tata Institute of Fundamental Research, India)
Watanabe, Mihoko (Kokugakuin University, Japan)
Yang, Hong-Jin (Korea Astronomy and Space Science Institute, Korea)
Yano, Michio (Kyoto Sangyo University, Japan)
Yokoo, Hiromitsu (Chiba University of Commerce, Japan)
Yoshida, Fumi (National Astronomical Observatory of Japan, Japan)
Yoshida, Seiko (Muroran Institute of Technology, Japan)

Conference Program

Session A – H (Pre-modern times)

Session I – N (Modern times & Other recent research)

Oral Papers

September 6 (Mon):

<Session A> [Chair: Ôhashi, Y.]

10:45–11:35AM, VAHIA, Mayank (Invited): "Megaliths in India and their possible relation to astronomy"

11:35 – 12:00AM, MENON, Srikumar M. and VAHIA, Mayank N.: "Megalithic astronomy in South India"

0:00 – 1:30PM

Lunch

<Session B> [Chair: Nakamura, T.]

1:30 – 2:20PM, MAEDER, Stefan (Invited): "The archaeology of the "Big Dipper" -- Some recent findings from Japan and Europe"

2:20–2:45PM, HARIAWANG, Irma I., SIMATUPANG, Ferry M. and RADIMAN, Iratius: "Orientation of Borobudur's East Gate measured against sunrise position during vernal equinox"

2:45–3:10PM, YANG, Hong-Jin, CHOI, Go Eun, MIHN, Byeong-Hee and AHN, Young Sook: "Analysis of Korean stone star chart using 3D scan measurement"

3:10–3:35PM, RENSHAW, Steven L.: "Prospects for scholarship in the archaeoastronomy and cultural astronomy of Japan: Interdisciplinary perspectives"

3:30–4:00PM

Tea Time

<Session C> [Chair: Ansari, R.]

4:00–4:50PM, TAJIMA, Toshiyuki (Invited): "National Astronomical Observatory of Japan and the postwar Japanese optical astronomy"

4:50–5:15PM, JUN, Yong Hoon: "Western astrology introduced in nineteenth-century Korea"

5:15 – 5:40PM, HOSOI, Hiroshi : "Theories about cosmic structure in ancient and medieval Japan"

September 7 (Tue):

<Session D> [Chair: Orchiston, W.]

9:20–9:45AM, SARMA, U K V: "Planetary models as expounded by Bhāskara in his commentary on Āryabhaṭīya"

9:45–10:10AM, LEE, Eun Hee and AHN, Young Sook: "Tenmon bunya nozu of Sibukawa Harumi and star maps of Joseon"

10:10–10:35AM, AHN, Sang-Hyeon: "Drawing method of the Korean Star-Chart, Chonsang-Yolcha-Punya-Ji-Do"

10:35–10:45AM

Tea Time

<Session E> [Chair: Orchiston/Nakamura]

10:45–11:35AM, NHA, Il-Seong and NHA, Sarah L. (Invited): "A classification of timekeeping instruments in East-Asian countries and inventory of significant relics prior to pendulum clocks"

11:35 – 12:00AM, TANIKAWA, Kiyotaka and SÔMA, Mitsuru: "How were eclipses memorized when there were no astronomers?"

0:00 – 1:30PM

Lunch

<Session F> [Chair: Débarbat, S.]

1:30 – 2:20PM, ANSARI, S.M. Razalliah (Invited): "A survey of Arabic-Persian sources on astrolabe extant in India and on the Indian school of astrolabe-makers"

2:20–2:45PM, KIM, Sang Hyuk and LEE, Yong Sam: "An analysis on the operation mechanism and restoration of Song I-Yeong's armillary clock"

2:45 – 3:10PM, LEE, Yong Bok: "Production and application of Ganpyeongui during Joseon Dynasty"

3:10 – 3:35PM, ÔHASHI, Yukio: "Two systems of Indian astronomy"

3:30–4:00PM

Tea Time

<Session G> [Chair: Sôma, M.]

4:00–4:50PM, QU, Anjing (Invited): "Planetary theory in China"

4:50–5:15PM, NAKAYAMA, Shigeru: "The merit and demerit of geometrical representation in the history of Chinese calendrical science"

5:15–5:40PM, LI, Liang, LU, Lingfeng and SHI, Yunli: "The accuracy of the eclipse calculation of the Huihuilifa"

September 8 (Wed):

<Session H> [Chair: Soonthomthum, B.]

9:20 – 9:45AM, SÔMA, Mitsuru and TANIKAWA, Kiyotaka: "Investigation of the Earth's rotation using ancient Chinese occultation records"

9:45 – 10:10AM, AKBARI, Marjan and AKHLAGHI, Mohammad: "Little known astronomer in the late Islamic period; a study of Qāsim-Ālī Al-Qāyīnī's manuscripts"

10:10–10:35AM, JOCHI, Shigeru: "The movement of observation center in the eastern Han Dynasty, China"

10:35–10:45AM

Tea Time

<Session I> [Chair: Vahia, M.]

10:45–11:35AM, EHGAMBERDIEV, Shuhrat (Invited): "Emergence of modern astronomy and astrophysics in Uzbekistan"

11:35 – 12:00AM, STROM, Richard, ZHAO, Fuyuan and ZHANG, Chengmin: "Could Oriental annals have recorded optically-bright γ -ray bursts?"

0:00 – 1:30PM

Lunch

<Session J> [Chair: Ehgamberdiev, S.]

1:30 – 2:20PM, HAYASHI, Masahiko (Invited): "Nobeyama radio observatory and the history of radio astronomy in Japan"

2:20 – 2:45PM, SAIJO, Keiichi: "The transition of characteristics in Japanese celestial globes of Edo era from the collection of National Museum of Nature and Science"

2:45 – 3:10PM, HIRAI, Masanori and FUJIWARA, Tomoko: "Two bronzed planispheres preserved in England since 1878 and Japan since 1683"

3:10–3:35PM, NAM, Moon-Hyon, HAHN, Young-Ho, SEO, Moon-Hwo and LEE, Jai-Hyo: "A restoration of 15th century Korean king Sejong's striking Clepsydra at National Palace Museum of Korea"

3:30–4:00PM,
Tea Time

<NAOJ Campus Tour and Welcome Party>

4:00–5:30PM, NAOJ Campus Tour

5:30–8:00PM, Welcome Party at Cafeteria

September 9 (Thu):

<Session K> [Chair: Strom, R.]

9:20 – 9:45AM, DÉBARBAT, Suzanne: "A peculiar manuscript from Delisle's jesuit correspondence"

9:45 – 10:35AM, RENSHAW, Steven L. (Invited): "Prospects for scholarship in the archaeoastronomy and cultural astronomy of Japan: Interdisciplinary perspectives"

10:35–10:45AM

Tea Time

<Session L> [Chair: Jochi, S.]

10:45–11:35AM, MATSUURA, Kiyoshi (Invited): "Star Mandaras, as visual images in which Buddhism coexists with astronomy or astrology"

11:35 – 12:00AM, LEE, Ki-Won, AHN, Young Sook, MIHN, Byeong-Hee and KIM, Bong-Gyu: "Incheon Meteorological Observatory and Comet Herschel-Rigollet"

0:00 – 1:30PM

Lunch

<Session M> [Chair: Nha, I.]

1:30 – 2:20PM, SOONTHORNTHUM, Boonrucksar (Invited): "The emergence of astronomy in Thailand"

2:20–2:45PM, HIDAYAT, Bambang: "The sky and the Agro-Bio-Climatology of Java: Need critical reevaluation due to environmental changes"

2:45 – 3:10PM, YOSHIDA, Seiko: "The flying Hirayama: Escape from asteroid families"

3:10 – 3:35PM, NAKAMURA, Tsuko: "A lunar map Taiin-no-Zu depicted in 1813 by a Japanese Feudal Warlord"

3:30–4:00PM

Tea Time

<Session N> [Chair: Hidayat, B.]

4:00 – 4:50PM, ORCHISTON, Wayne and WENDT, Harry (Invited): "The contribution of the ex-Georges heights experimental radar antenna to Australian radio astronomy"

4:50 – 5:15PM, STEWART, Ron, GEORGE, Martin, ORCHISTON, Wayne and SLEE Bruce: "A retrospective view of Australian solar radio astronomy. 2: 1960-1985"

5:15 – 5:40PM, STROM, Richard: "Conference summary"

September 10 (Fri):

<One-day Bus Tour to Nobeyama & Suwa>

8:30AM, Departure of Tour Bus

Poster Papers

1. MAEDER, Stefan: "The Sword, the Snake & the Turtle - Three constellations from pre-modern China?"

2. OH, Gilsun: "Replications of ancient star maps by a computer"

3. NARIKE, Tetsuro: "Guo Mo-ruo and Babylonian astronomy: The origin of the Chinese Twelve-Branch"

4. OZAWA, Kenji: "Discovery of degrees in Ancient China"

5. YOKOO, Hiromitsu: "Accuracy of north-south orientation by the Indian-circle method of a gnomon and the use of the recorded ancient orientations"

6. ÔHASHI, Yukio: "Mathematical astronomy of SEKI Takakazu and SHIBUKAWA Harumi --- Understanding and overcoming the Chinese traditional calendars in the Edo Period of Japan"

7. ÔHASHI, Yukio: "Astronomy and mathematics of Yixing"

8. EHGAMBERDIEV, Shuhrat: "Ulugh Beg's catalogue of stars and al-Sufi's sky map"

9. VAHIA, Bambang, YADAV, Nisha and MENON, Srikumar: "Foundations of Harappan Astronomy"

10. LEE, Yong Bok and AHN, Young-sook: "Analysis of solar eclipses records in Samguksagi"

11. KIM, Sang Hyuk, LEE, Yong Sam and LEE, Min Soo: "An analysis on the operation mechanism and 3D restoration of Ongnu in Sejong Era"

12. OKAZAKI, Akira and TANOKURA, Mizuho: "An examination of astronomical records in Vietnamese historical source"

13. CHOI, Go-Eun, KIM, Dong Bin, LEE, Yong Bok, AHN, Young Sook and LEE, Yong Sam: "A study of Korean Astronomical Almanacs for the period of 1864 – 1945"

14. ANDROPOULOS, Jenny, ORCHISTON, Wayne and CLARK, Barry: "Williamstown Observatory and the development of professional Astronomy in Australia"

15. COTTAM, Stella, ORCHISTON, Wayne and STEPHENSON, Richard: "The 1882 transit of Venus and the popularisation of astronomy through the pages of the New York Times"

16. HAFEZ, Ihsan, STEPHENSON, Richard and ORCHISTON, Wayne: "Al-Sufi's investigation of stars, star clusters and nebulae"

17. ORCHISTON, Wayne and LUCIUK, Michael: "Ronald McIntosh and the role of the amateur in New Zealand meteor astronomy"

18. ORCHISTON, Wayne and PEARSON, John: "The Lick Observatory and the development of professional astronomy in Western Australia"

19. ORCHISTON, Wayne and PEARSON, John: "The Lick Observatory and the development of solar astronomy in India"

20. ORCHISTON, Wayne, DUERBECK, Hilmar, GLASS, Ian, MALVILLE, Kim, MARSDEN, Brian, SIMONIA, Irakli, SLEE, Bruce, STEPHENSON, Richard, STROM, Richard, WHITTINGHAM, Ian and WIELEBINSKI, Richard: "History of astronomy at James Cook University, Australia"

21. PEARSON, John and ORCHISTON, Wayne: "The Lick Observatory and the development of professional astronomy in Indonesia"

22. SAUTER, Jefferson, SIMONIA, Irakli, STEPHENSON, Richard and ORCHISTON, Wayne: "The legendary fourth century Georgian total solar eclipse: fact or fantasy?"

23. WELLS, Bill and ORCHISTON, Wayne: "Early scientific astronomy on the American Northwest Coast: Captain Cook's Sojourn at Nootka Sound in 1778"





Left: Nobeyama Radio Observatory
Right: Gishodo Clock Museum (Suwa city)