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CHAPTER III

THIRTY-FIRST GENERAL ASSEMBLY

SPECIAL PRESENTATIONS, PLENARY DISCOURSES AND SOCIAL EVENTS

1. Division Meetings

Division meetings were held on August 5 and 8, 2022 at BEXCO and virtually on IAU GA2022's meeting platform. More information can be found on each Division's page.

2. Prize Lectures

2.1. Recipients of the Kavli Foundation Prize

This lecture is given by Prof. Jørgen Christensen-Dalsgaard on behalf of the three recipients of the Kavli Prize in Astrophysics 2022.

Prof. Jørgen Christensen-Dalsgaard (Aarhus University), Thursday, Aug. 4

The historical road and future path of helio- and asteroseismology

Jørgen Christensen-Dalsgaard is, from 1 July 2022, Professor Emeritus at the Department of Physics and Astronomy, Aarhus University, and he heads the Stellar Astrophysics Centre, funded by the Danish National Research Foundation. He received a PhD in Astrophysics from Cambridge University. He has contributed to the development of helio- and asteroseismology from the inception of these fields, including work on stellar modelling and data analysis techniques involving frequency fitting and inverse analyses of seismic data. In addition, he took part in the establishment of ground- and space-based instrumentation for helio- and asteroseismology, including contributions to the definition of the SoHO satellite. He has had overall responsibility for the asteroseismic use of data from the NASA Kepler and TESS missions, with the establishment of the Kepler and TESS Asteroseismic Science Consortia. He served as Danish delegate on the ESA Science Programme Committee and, for one year, as its president.

Conny Aerts is Full Professor of Astrophysics at the Department of Physics and Astronomy, KU Leuven, Belgium, as well as Part-time Professor of Asteroseismology at the Radboud University Nijmegen, NL and External Scientific Member of the Max Planck Society in Heidelberg, Germany. She earned an MSc degree in Mathematics from Antwerp University and a PhD from KU Leuven. She contributed to the development of asteroseismology, with emphasis on fast rotators and massive stars relying on ground- and spacebased data. Her work involves instrumentation, data analysis, and methodology for both the identification of nonradial oscillation modes and asteroseismic modelling. She provided personal supervision to 45 MSc and 40 PhD students, in addition to 15 externally recruited postdocs so far. Aside from her participation in

numerous international committees and advisory boards, she lectures various BSc and MSc courses annually, leads numerous outreach initiatives focusing on gender in STEM, and is Belgian PI of the PLATO space mission.

Roger Ulrich is Research Professor of Astronomy at UCLA. He received his PhD from UC Berkeley from the Department of Astronomy under Louis Henyey in 1969. After receiving his PhD, he went to Cal Tech and began a collaboration with John Bahcall studying solar neutrino fluxes that lasted years. His interest in the solar 5-minute oscillations began with observations by fellow graduate student Ed Frazier which showed that the oscillatory motion was disrupted by convection cells rather than being generated. Based on that clue, he carried out a modal analysis of a solar envelope. Ulrich with the assistance of Edward Rhodes, Jr. and independently by Franz Deubner confirmed that prediction using new instrumentation that measured 2-dimensional grids of the velocity at regular time intervals for a duration of hours. He was appointed Assistant Professor at UCLA and remained there until he retired in 2008. In 1986 he began managing the 150-foot solar tower telescope on Mt. Wilson and continues to analyse data acquired from that system.

2.2. Recipients of the Shaw Foundation Prize

This lecture is given by Prof. Lindegren on behalf of both recipients of the Shaw Prize in Astronomy 2022.

Prof. Lennart Lindegren (Lund University), Wed. Aug. 10

Gaia and global space astrometry: A historical perspective

Lennart Lindegren is Professor Emeritus at the Lund Observatory, Department of Astronomy and Theoretical Physics at Lund University, Sweden. He was a member of the European Space Agency's Hipparcos Science Team (1976–1997) and the Gaia Science Advisory Group (1997–2000). Since 2001 he has been a member of ESA's Gaia Science Team. His many studies of the technical and mathematical aspects of space astrometry have helped to shape both missions. Within the Gaia Data Processing and Analysis Consortium he leads the scientific implementation of the core astrometric solution.

Michael Perryman was ESA's Project Scientist for the full duration of the Hipparcos mission (1980–1997). In 1993 he proposed, together with Lindegren, an ambitious follow-up mission to Hipparcos which eventually developed into Gaia, accepted by ESA in 2000. Perryman was the project scientist for Gaia from its inception to his retirement from ESA in 2009. He received a degree in mathematics and theoretical physics, and a PhD in astrophysics, from the University of Cambridge, and today is Adjunct Professor of the University College Dublin.

3. Invited Discourses

- **Early Science with the James Webb Space Telescope**
  Dr. Klaus Pontoppidan (STScI), Wed Aug 3

- **The Hubble Tension**
  Prof. Sherry Suyu (MPA/TUM), Thurs. Aug. 4

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- **Superflares and super coronal mass ejection on solar types stars**
  Dr. Hiroyuki Maehara (NAOJ), Wed. Aug. 10

4. Symposium Plenary Lectures

- **IAUS 368 Machine Learning in Astronomy: Possibilities and Pitfalls**

  Machine Learning in Astronomy: From the Star-Galaxy Separation to a Collaborative Human-AI Discovery
  Prof. George Djorgovsky

  Deep Learning in Astronomy: Trends and Challenges
  Prof. Ofer Lahav

- **IAUS 369 The dawn of Cosmology & Multi-Messenger studies with Fast Radio Bursts**

  Observational Properties of Fast Radio Bursts
  Prof. Victoria Kaspi

  Multi wavelength studies and cosmological uses of FRBs
  Dr. Javier Prochaska

- **IAUS 370 Winds of Stars and Exoplanets**

  Winds and magnetospheres from stars and planets: Similarities and differences
  Prof. Stanley Owocki

- **IAUS 371 Honouring Charlotte Moore Sitterly: Astronomical Spectroscopy in the 21st Century**

  Turning Chaos into Order: The Life and Work of Charlotte Moore Sitterly
  Dr. David DeVorkin

  Legacy of Charlotte Moore Sitterly in the Internet Age
  Dr. Alexandre Kramida

- **IAUS 372 The Era of Multi-Messengers Solar Physics**

  Challenges and opportunities in solar and heliospheric physics at the dawn of the multi-messenger era
  Prof. Valentin Martinez Pillet

- **IAUS 373 Resolving the Rise and Fall of Star Formation in Galaxies**

  Star Forming Galaxies Resolved into their Fundamental Units
  Prof.Ádam Leroy

  Star formation across the bodies of galaxies and its suppression: a theoretical overview
  Dr. Annalisa Pillepich

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Exploring star formation and quenching via observations, simulations and synergies
Prof. Yingjie Peng

- **IAUS 374 Astronomical Hazards for life on Earth**

Rare Earth Got It Wrong: Astronomical Hazards and Habitability
Dr. Milan Ćirković

5. Focus Meetings

FM 1 Physics of Relativistic Jets on All Scales

FM 2 Towards a World Standard for Dark and Quiet Sky Protection

FM 3 Consensus Cosmic Shear in the 2020s

FM 4 UV insights to Massive Stars and Young Stellar Clusters

FM 5 Beyond the Goldilocks Zone: the Effect of Stellar Magnetic Activity on Exoplanet Habitability

FM 6 Dynamics of the ICM: Radio and X-ray Observations and Theory

FM 7 Astrometry for 21st Century Astronomy

FM 8 Planetary Astronomy via Telescopic and Microscopic Approaches

FM 9 Stellar Synthetic Spectra to Study Stellar Populations in the Gaia Era

FM 10 Synergy of Small Telescopes, and Large Surveys for Solar System and Exoplanetary Bodies Research

6. Public Lectures

Imaging a Supermassive Black Hole, Prof. Sheperd S. Doeleman, Fri. Aug. 5

Dr. Sheperd S. Doeleman is the Founding Director of the Event Horizon Telescope (EHT), and an astrophysicist at the Center for Astrophysics — Harvard & Smithsonian (CfA), USA. By studying supermassive black holes, he pursues answers to several fundamental questions about the Universe: Do event horizons exist? Does Einstein's theory of gravity hold near a black hole? How do black holes affect the evolution of galaxies? Under his leadership, the EHT collaboration, consisting of more than 200 researchers around the world, successfully produced the first directly observed image of a black hole. This was made possible by linking together radio dishes across the globe to establish an Earth-size virtual telescope that achieved the highest angular resolution possible from the surface of our planet. He is now leading the next-generation EHT (ngEHT) project aimed at making the first movies of black holes. He received a B.A. from Reed College and a Ph.D. in astrophysics from MIT. He served as an assistant director of

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the MIT Haystack Observatory prior to joining the Harvard-Smithsonian Center for Astrophysics in 2012, where he is also co-director of the Black Hole Initiative at Harvard.

The State of the Universe, Prof. Brian Schmidt, Sat. Aug. 6

Prof. Brian Schmidt is Vice-Chancellor and President of the Australian National University (ANU), as well as a Professor at the Research School of Astronomy and Astrophysics at ANU. His research is focused on understanding the universe. He formed the High-z Supernova Search Team in 1994, aiming to determine the expansion rate of the universe using the most distant supernovae. Prof. Schmidt shared the 2006 Shaw Prize in Astronomy and the 2011 Nobel Prize in Physics along with Saul Perlmutter and Adam G. Riess for the discovery of the accelerating universe, consistent with the universe entering a dark energy dominated era roughly 4 billion years ago. He also studies gamma-ray bursts, which are the most energetic phenomena in the universe, and other stellar transients including supernovae of various types. Most recently, he co-lead the Southern Sky Survey team using the SkyMapper optical telescope located in northern New South Wales, Australia. The Southern Sky Survey aims to create a digital survey of the entire Southern sky. He received a B.A. in Physics and Astronomy from the University of Arizona and a Ph.D. in Astronomy from Harvard University.

7. Social Events

7.1. Young Astronomers Lunch

Fri. Aug. 5

The aim of the Young Astronomers Lunch (YAL) is to stimulate networking opportunities between senior astronomers and young astronomers at the start of their careers. The main objectives of the YAL are:

- to give young astronomers (i.e. early career astronomers) the opportunity to discuss predefined topics of their choice, related to careers and research organisation in astronomy, with more experienced astronomers,
- to raise the awareness of the YAs of their importance to the IAU,
- to enhance networking among YAs of different countries.

A generous donation by US National Academy of Sciences (US NAS) and the Norwegian Academy of Science and Letters (NASL) made this event possible.

7.2. Women in Astronomy Lunch

Mon. Aug. 8

The gender and diversity dimension of science and technology has become one of the most important and debated issues worldwide, impacting society at every level. The International Astronomical Union, through its Executive Committee Working Group on Women in Astronomy, has been a strong advocate for discussing these themes openly and for supporting initiatives that can improve a more balanced representation of diversity in our community. In this context, the Organizing Committee of the IAU EC WG on Women in Astronomy together with the NOC of the IAU-GA in Busan are

proud to announce the Women in Astronomy Lunch Meeting (WL) for networking and discussions of important issues.

A generous donation by US National Academy of Sciences (US NAS) made this event possible.

7.3. Conference Dinner

Tues. Aug. 9

This dinner took place at Hall 5A, Exhibition Center II, BEXCO. Entertainment included a traditional Korean dance performance.

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