

# 400 Years of Astronomical Telescopes: A Review of History, Science and Technology

## PROGRAMME

Monday 29 September 2008

|                  |  |                     |
|------------------|--|---------------------|
| 09:00            | <i>Welcome, registration and coffee</i>  |                     |
| 09:40            | Opening address by ESTEC   | Martin Kessler      |
| 09:50            | Opening address by the IAU   | Karel van der Hucht |
| <b>Session 1</b> | <b>History of Optical Telescopes</b><br>Chair: Peter Abrahams (Antique Telescope Society)              |                     |
| 10:00            | The Beginnings in the Netherlands, from Lipperhey to Huygens   | Albert van Helden   |
| 10:50            | Galileo's Telescope: History, Scientific Analysis, and Replicated Observations                         | Giorgio Strano      |
| 11:40            | <i>Coffee break</i>  |                     |
| 12:00            | The Era of Newton, Herschel & Lord Rosse   | Jim Bennet          |
| 12:35            | The Great 19th Century Refractors  | James Lequeux       |
| 13:10            | <i>Lunch break</i>   |                     |
| <b>Session 1</b> | <b>History of Optical Telescopes (cont.)</b><br>Chair: Harry van der Laan (Leiden Observatory)         |                     |
| 14:10            | In the Grip of the Big Telescope Age   | David DeVorkin      |
| 14:45            | Beautiful and Cantankerous Instruments: Telescopes, Technology, and the Changing Practice of Astronomy | Patrick McCray      |
| 15:20            | <i>Coffee break</i>  |                     |
| 15:50            | The History of Optical Instruments   | Guy Monnet          |
| <b>Session 2</b> | <b>History of Non-Optical Telescopes</b>   |                     |
| 16:25            | The History of Radio Telescopes  | Woody Sullivan      |
| 17:00            | History of Infrared Telescopes and Astronomy   | George Rieke        |
| 17:35            | <i>To Space Expo</i>   |                     |
| 18:00            | <i>Welcoming Reception @ Space Expo &amp; Announcement of Selected Poster Presentations</i>            |                     |

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| Session 3 | History of Non-Optical Telescopes (cont.)<br>Chair: Joachim Truemper (Max Planck Institut fuer extraterrestrische Physik) |                     |
| 09:00     | History of X-ray Telescopes and Astronomy   | Riccardo Giacconi   |
| 09:50     | History of Gamma - Ray Telescopes and Astronomy   | Klaus Pinkau        |
| 10:25     | History of Solar Telescopes and Astronomy   | Oskar von der Luehe |
| 11:00     | <i>Coffee</i>   |                     |
| 11:20     | Imaging VHE Gamma-Ray Telescopes  | Heinz Voelk         |
| 11:55     | History of Neutrino Telescopes/Astronomy  | Atsuto Suzuki       |
| Session 4 | Miscellaneous Aspects and Projects<br>Chair: Donald Morton (National Research Council of Canada)                          |                     |
| 12:45     | 400 Years of Astrometry: From Tycho Brahe to Hipparcos  | Erik Hog            |
| 13:20     | <i>Lunch break</i>  |                     |
| 14:20     | History of Astronomical Discoveries   | Malcolm Longair     |
| 15:10     | Capabilities of Amateur Telescopes  | Detlef Koschny      |
| 15:45     | <i>Coffee break</i>   |                     |
| 16:05     | Building the Hubble Space Telescope   | Bob O'Dell          |
| 16:40     | Zooming in on the Galactic Center   | Reinhard Genzel     |
| 17:50     | <i>Buses to Museum Boerhaave</i>  |                     |
| 18:15     | <i>Boerhaave: Arrival</i>   |                     |
| 18:30     | <i>Boerhaave: Welcome - Dirk van Delft</i>  |                     |
| 18:35     | <i>Boerhaave: "Leiden Observatory" - Harry van der Laan</i>   |                     |
| 19:00     | <i>Boerhaave: Introduction to Exhibit - Hans Hooijmaijers</i>   |                     |
| 19:20     | <i>Boerhaave: Exhibition and walking dinner</i>   |                     |
| 21:00     | <i>Busses back to the hotels</i>  |                     |

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Wednesday 1 October 2008

|           |   |                     |
|-----------|---|---------------------|
| Session 5 | Fundamental Telescope Technologies<br>Chair: Dietrich Lemke (Max Planck Institut fuer Astronomie) |                     |
| 09:00     | Technology: Mirror Casting, Polishing, Segmentation, and Active Optics                            | Lothar Noethe       |
| 09:35     | Telescope Designs: Technology Keeping Up with Design or Vice Versa                                | Jason Spyromilio    |
| 10:10     | A breakthrough in astronomy: the advent of adaptive optics  | Pierre Léna         |
| 10:45     | <i>Coffee break</i>   |                     |
| 11:15     | Technology: Interferometry (All Wavelengths)  | Andreas Quirrenbach |
| 11:50     | The Rise of the Submillimetre   | Ian Robson          |
| 12:25     | Back to the Future: Technology Directions for Radio Astronomy                                     | Jim Cordes          |
| 13:00     | <i>Lunch break</i>  |                     |
| 14:00     | <i>Poster Presentations</i><br>Chair: Remko Stuik (Leiden Observatory)                            |                     |
| 15:00     | <i>Coffee break</i>   |                     |
| 15:30     | Realisation of X-ray telescopes - from design to performance                                      | Bernd Aschenbach    |
| 16:05     | Technology: Gamma-ray telescopes  | Neil Gehrels        |
| Session 6 | Political and Sociological Aspects  |                     |
| 16:40     | ESO's Past and Future   | Lo Woltjer          |
| 17:15     | Telescope Technology to Harvest Solar Energy  | Roger Angel         |
| 18:00     | <i>Buses to Dinner Cruise</i>   |                     |
| 18:30     | <i>Dinner Cruise</i>  |                     |

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Thursday 2 October 2008

|           |   |                  |
|-----------|---|------------------|
| Session 7 | Political and Sociological Aspects (cont.)  |                  |
| 09:00     | Telescopes and Sacred Mountains   | Günther Hasinger |
| 09:35     | Environmental Threats to Astronomy - What to Do?  | David Crawford   |
| 10:10     | The Role of Observatories in Underdeveloped Countries   | Kevin Govender   |
| 10:45     | <i>Coffee</i>   |                  |
| 11:15     | Telescopes Seen Through the Lens of Scientometrics  | Virginia Trimble |
| 11:50     | Space Astronomy as Very Big Science   | Robert Smith     |
| 12:25     | Conceiving and Marketing NASA's Great Observatories   | Martin Harwit    |
| 13:00     | <i>Lunch</i>  |                  |
| Session 8 | Perspectives for Future Telescopes  |                  |
| 14:00     | Future Technologies for Telescopes and Instruments  | Colin Cunningham |
| 14:35     | Challenges and Perspectives for Future Telescopes   | Tim de Zeeuw     |
| 15:25     | <i>Conference Close</i>   |                  |
|           | Poster Session  |                  |
|           | <p>The Rise and Fall of Australian Colonial Observatories<br/><i>Tasker, Ian</i><br/><i>University of Western Sydney (Australia)</i></p> <p>650 Years of Optics: From Alhazen to Fermat and Rømer<br/><i>Hoeg, Erik</i><br/><i>Niels Bohr Institute, Copenhagen University (Denmark)</i></p> <p>History of Development of Astronomical X-ray Telescopes in the Eastern Europe<br/><i>Hudec, Rene</i><br/><i>Astronomical Institute (Czech Republic)</i></p> <p>Astronomical X-ray Telescopes of Lobster Eye Type<br/><i>Hudec, Rene</i><sup>1</sup>; <i>Pina, L.</i><sup>2</sup>; <i>Sveda, L.</i><sup>2</sup>; <i>Inneman, A.</i><sup>3</sup>; <i>Semencova, V.</i><sup>3</sup>; <i>Skulinova, M.</i><sup>1</sup><br/><i>1Astronomical Institute AS CR (Czech Republic); 2CTU (Czech Republic); 3RITE (Czech Republic)</i></p> <p>Precursors of the Hubble Space Telescope<br/><i>Morton, Donald</i><br/><i>National Research Council of Canada (Canada)</i></p> <p>The Astronomical Telescope between Kepler and Newton<br/><i>Mahoney, Terence</i><br/><i>Instituto de Astrofísica de Canarias (Spain)</i></p> <p>Galileo 1610: an Original Play for the International Year of Astronomy<br/><i>Larrouy, C.</i><sup>1</sup>; <i>Lacoste, G.</i><sup>1</sup>; <i>Blanc, M.</i><sup>1</sup>; <i>Blanc, E.</i><sup>1</sup>; <i>Habibi, E.</i><sup>1</sup>; <i>Baratte, Y.</i><sup>1</sup>; <i>Gibert, B.</i><sup>1</sup>; <i>Fuerte, L.</i><sup>1</sup>; <i>Gaboriaud, R.</i><sup>2</sup>; <i>Gaboriaud, A.</i><sup>3</sup>; <i>Von Ballmoos, P.</i><sup>4</sup><br/><i>1Théâtre Extensible (France); 2Prodigima (France); 3CNES (France); 4CESR (France)</i></p> |                  |

Solar Telescopes of the Crimean Astrophysical Observatory: History of Establishment and Discoveries

*Vavilova, Iryna*<sup>1</sup>; *Stepanyan, N.N.*<sup>2</sup>

*1Main Astronomical Observatory, NAS of Ukraine (Ukraine); 2Crimean Astrophysical Observatory (Ukraine)*

Ukrainian T-Shape Radio Telescope UTR-2 and Ukrainian VLBI System URAN: 50 Years at the Service of Decameter Astronomy

*Vavilova, Iryna*<sup>1</sup>; *Konvalenko, A.A.*<sup>2</sup>; *Miroshnichenko, A.P.*<sup>2</sup>

*1Main Astronomical Observatory, NAS of Ukraine (Ukraine); 2Institute of Radio Astronomy, NAS of Ukraine (Ukraine)*

The Infrared Space Observatory (ISO)

*Salama, Alberto*<sup>1</sup>; *Cesarsky, C.*<sup>2</sup>; *Clegg, P.*<sup>3</sup>; *de Graauw, T.*<sup>4</sup>; *Kessler, M.F.*<sup>5</sup>; *Lemke, D.*<sup>6</sup>; *Steinz, H.*<sup>5</sup>

*1ESA (Spain); 2ESO (Germany); 3Queen Mary, University of London (United Kingdom); 4SRON (Netherlands); 5ESA - ESTEC (Netherlands); 6Max-Planck-Institut für Astronomie (Germany)*

Observations with Small Telescopes at the Terskol Observatory: Results and Benefits

*Godunova, Vira; Tarady, V.K.; Sergeev, O.V.; Karpov, M.V.; Zhilyaev, B.E.*

*ICAMER Observatory (Ukraine)*

Fraunhofer Refractor at Tartu Observatory

*Annik, Kalju*

*Tartu Observatory (Estonia)*

From Observation to Gaia Catalogue

*Blasco, Carmen*

*ESA (Netherlands)*

The Gaia Spacecraft and Instruments

*Blasco, Carmen*

*ESA (Netherlands)*

Gaia Mission Overview

*Blasco, Carmen*

*ESA (Netherlands)*

Amateur Robotic Telescope

*Nieuwenhout, Frans*

*AWSV Metius (Netherlands)*

Small Robotic Telescopes for HEA in Ondrejov

*Nekola, Martin*<sup>1</sup>; *Strobl, Jan*<sup>1</sup>; *Kocka, Matus*<sup>1</sup>; *Hudec, Rene*<sup>1</sup>; *Simon, Vojtech*<sup>1</sup>; *Jelinek, Martin*<sup>2</sup>; *Polasek, Cyril*<sup>1</sup>; *Munz, Filip*<sup>3</sup>

*1Astronomical Institute of the Academy of Sciences (Czech Republic); 2IAA CSIC, Granada (Spain); 3IASF/INAF, Bologna (Italy)*

Gaia's Scientific Rewards

*Blasco, Carmen*

*ESA (Netherlands)*

The Great Melbourne Telescope: A Contextual History

*Gillespie, Richard*

*Museum Victoria (Australia)*

XMM-Newton: Across the X-ray Universe

*Gonzalez-Riestra, Rosario ; Rodriguez-Pascual, P.M.*

*XMM-Newton Science Operation Centre (Spain) v*

AKARI: Space Infrared Cooled Telescope

*Onaka, Takashi*<sup>1</sup>; *Salama, Alberto*<sup>2</sup>

*1University of Tokyo (Japan); 2European Space Astronomy Centre, ESA (Spain)*

Airborne Infrared Telescopes  
*Erickson, Edwin*  
*NASA Ames Research Center (United States)*

The Early Spread of the Telescope in Asia  
*Zoomers, Henk*  
*Asian Historical Consultancy (Netherlands)*

Galileo and the Birth of Science  
*Saucedo Morales, Julio*  
*Universidad de Sonora (Mexico)*

A Focusing Telescope for Gamma-ray Astronomy  
*von Ballmoos, Peter*  
*CESR (France)*

European Astronomy in Antarctica  
*Zinnecker, Hans*  
*Astrophysikalisches Institut Potsdam (AIP) (Germany)*

On the Telescopes in the Painting of Bruegel "The Vision"  
*Selvelli, Pierluigi*  
*INAF (Italy)*