SECOND CIRCULAR
21st International Workshop on Laser Ranging
“Laser Ranging for Sustainable Millimeter Geoscience”
Canberra, Australia, 5-9 November 2018 at the John Curtin School of Medical Research (JCSMR)

The International Program Committee is pleased to announce the following keynote speakers for IWLR 2018
Professor Thomas Herring, Massachusetts Institute of Technology, Cambridge &
Associate Professor Moriba Jah, University of Texas at Austin

Abstract Submission
Abstract submissions for the 21st IWLR opened in February 2018. Early submission of abstracts is encouraged to allow sufficient time for visa processes and travel arrangements to be made. The closing date for abstracts is **Friday 29 June**. Successful oral and poster presenters will be notified by Friday 31 August 2018. Please submit abstracts both oral and poster presentations via the following link [http://iwlr2018.serc.org.au/#abstracts](http://iwlr2018.serc.org.au/#abstracts)

Oral Presentations
Oral presentations are invited in the following Session Themes:
- SLR Contribution to Global Geodetic Observing System – a 2020 perspective
- Improvements in the SLR Product Quality & Precise Orbit Determination
- Satellite Missions & Techniques for Geodetic Applications
- Characteristics of Retroreflector Arrays
- Sources of Systematic Errors
- Network Operations & Site Upgrades
- Developments in SLR Techniques & Technologies
- Developments in Software & Automation
- Lunar Laser Ranging & Deep Space Missions
- Sensors & Satellite Tracking
- Orbit Determination & Propagation of Space Debris
- Conjunction Analysis & Collision Avoidance
- Mitigation & Remediation of Space Debris

**Oral Presentation Duration:**
15 minute speaking time which includes 12 minutes to present and 3 minutes for questions

Poster Presentations
The 21st IWLR has dedicated significant program time to poster sessions. Poster submissions are encouraged for each Session Theme (outlined above). In addition, posters which provide an update on station activities are **strongly encouraged**. Station Posters could include:
- **Current Status** – recent developments and upgrades, productivity, data statistics, quality metrics, calibration techniques & performance
• Operations – operating mode, staff levels, scheduling, software & other management initiatives
• Future Status - new technologies, developments, equipment upgrades, operational constraints
• Related Activities – co-located systems (GNSS, GPS, Doris, VLBI etc)
• Other Projects – time transfer, debris tracking, photometry
• Pictures & Images - site location, staff, telescope, major devices, system schematics

Poster Dimensions:
Size - AO (Width 841mm x Height 1189mm)
Orientation - Portrait

Young Professionals
The International Program Committee encourages young professionals (35 years or younger or within five years of PhD completion) to submit oral and/or poster presentations for IWLR2018. Special consideration will be given to abstracts submitted by young professionals and the Committee hopes to see at least one oral presentation in each session presented by a young professional.

IWLR organisations are asked to consider sponsoring a young professional to attend IWLR 2018. Sponsorship opportunities are outlined in the sponsorship prospectus available at http://iwlr2018.serc.org.au/assets/iwlr_prospectus_15april.pdf

Session Chairs
The International Organising Committee would like to thank the following session chairs for supporting IWLR 2018.

International Workshop on Laser Ranging – Mon 5 to Thurs 8 November

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<td>David Ball, Space Environment Research Centre</td>
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<td>Satellite Missions &amp; Techniques for Geodetic Applications</td>
<td>John Degnan, Sigma Space Corporation, Ulrich Schreiber, Technical University of Munich, Andrey Sokolov, SRI for Precision Instrument Engineering</td>
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<td>Characteristics of Retroreflector Arrays</td>
<td>Jose Rodriguez, NERC Space Geodesy Facility, Simone Dell’Agnello, Istituto Nazionale di Fisica Nucleare, Andrew Menas, Naval Research Laboratory</td>
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<td>Sources of Systematic Errors</td>
<td>Daniela Thaller, Federal Agency for Cartography &amp; Geodesy, Matthew Wilkinson, NERC Space Geodesy Facility, Toshimichi Otsubo, Hitotsubashi University</td>
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<td>Network Operations &amp; Site Upgrades</td>
<td>Hyung-Chul Lim, Korea Astronomy and Space Science Institute, Randall Ricklefs, University of Texas at Austin, Zhang Zhongping, Shanghai Astronomical Observatory</td>
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<td>Developments in SLR Techniques &amp; Technologies</td>
<td>Georg Kirchner, Austrian Academy of Sciences, Manuel Catalán, Royal Observatory of the Spanish Navy, Daniel Hampf, German Aerospace Centre</td>
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<td>Lunar Laser Ranging &amp; Deep Space Missions</td>
<td>Tom Murphy, Center for Astrophysics and Space Sciences, UCSD, Sven Bauer, Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Jean-Marie Torre, Observatorio de la Cote d’Azur</td>
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<td>Wrap up and Close IWLR proceedings</td>
<td>Michael Pearlman, Harvard Smithsonian Center for Astrophysics, Erricos Pavlis, Joint Center for Earth Systems Technology, UMBC, Giuseppe Bianco, Italian Space Agency</td>
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Space Debris Workshop – Friday 9 November

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<td>Associate Professor Moriba Jah, University of Texas at Austin</td>
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<tr>
<td>Sensors &amp; Satellite Tracking</td>
<td>Craig Smith, EOS Space Systems</td>
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<td>Yue Gao, EOS Space Systems</td>
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<td>Pawel Lejba, Space Research Centre of the Polish Academy of Sciences</td>
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<td>Orbit Determination &amp; Propagation</td>
<td>Moriba Jah, University of Texas at Austin</td>
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<td>Michael Steindorfer, Space Research Institute, Austrian Academy of Sciences</td>
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<td>Igor Zayer, European Space Agency</td>
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<td>Conjunction Analysis &amp; Collision Avoidance</td>
<td>James Bennett, Space Environment Research Centre</td>
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<td>Daniel Kucharski, Space Environment Research Centre</td>
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<td>Quirin Funke, Space Debris Office, European Space Agency</td>
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<td>Mitigation &amp; Remediation</td>
<td>Ben Greene, Electro Optic Systems</td>
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<td>Matthew Bold, Lockheed Martin</td>
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<td>Jung Hyun, Space Science Division, Korea Astronomy and Space Science Institute</td>
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<tr>
<td>Wrap up and Close Space Debris Workshop</td>
<td>Ben Greene, Electro Optic Systems</td>
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EOS Space Research Centre Tour & BBQ - Friday 9 November
A tour of the EOS Space Research Centre (telescope) and BBQ at Mount Stromlo will follow the Space Debris Workshop on Friday 9 November. The Space Debris Workshop, tour and BBQ are included in the registration price (student and full registrations). Additional tickets can be purchased via the workshop website [http://iwlr2018.serc.org.au/#register](http://iwlr2018.serc.org.au/#register)

3rd Meeting of the Asian Oceanian VLBI Group (AOV)
The third meeting of the AOV will be hosted by Geoscience Australia in Canberra from 9-10 November. The meeting is scheduled between the 21st IWLR (5-9 Nov) and the 7th International VLBI Technology Workshop (IVTW) in Krabi, Thailand (12-15 Nov).
The meeting will discuss current and future topics of the AOV and foster collaborations. The two-day meeting will consist of discussions on VLBI topics and a presentation style workshop on Saturday. IWLR participants with interest in VLBI and SLR activities in the Asia-Pacific region are encouraged to attend. For more information, please visit [http://auscope.phys.utas.edu.au/aov/](http://auscope.phys.utas.edu.au/aov/)

The Space Environment Research Centre would like to thank the following 21st IWLR Sponsors:

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<th>Welcome Reception</th>
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<th>Supporting Organisation</th>
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For further information, please visit the 21st IWLR website [http://iwlr2018.serc.org.au/](http://iwlr2018.serc.org.au/) or email:
IWLR Secretariat: [michellefulton@serc.org.au](mailto:michellefulton@serc.org.au)
IWLR Conference Manager: [claire@conlog.com.au](mailto:claire@conlog.com.au)
# DRAFT PROGRAM

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<th>DATE</th>
<th>SUNDAY 4 NOVEMBER</th>
<th>MONDAY 5 NOVEMBER</th>
<th>TUESDAY 6 NOVEMBER</th>
<th>WEDNESDAY 7 NOVEMBER</th>
<th>THURSDAY 8 NOVEMBER</th>
<th>INTERNATIONAL WORKSHOP ON SPACE DEBRIS MANAGEMENT AND MITIGATION FRIDAY 9 NOVEMBER</th>
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<td>LOCATION</td>
<td>Mt Stromlo Observatory</td>
<td>John Curtin School of Medical Research (JCSMR)</td>
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<tr>
<th>TIME</th>
<th>JCSMR</th>
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<tr>
<td>8:00 - 8:30</td>
<td>Space Debris Study Group</td>
</tr>
<tr>
<td>8:30 - 9:30</td>
<td>ASC</td>
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<tr>
<td>9:30 - 10:00</td>
<td>Session 1</td>
</tr>
<tr>
<td>10:00 - 10:30</td>
<td>MORNING TEA</td>
</tr>
<tr>
<td>10:30 - 12:00</td>
<td>ASC</td>
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<tr>
<td>12:00 - 12:45</td>
<td>LUNCH</td>
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<tr>
<td>12:45 - 13:30</td>
<td>POSTER SESSION A</td>
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<td>13:30 - 15:00</td>
<td>ASC</td>
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<td>15:00 - 15:30</td>
<td>AFTERNOON TEA</td>
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<td>15:30 - 17:00</td>
<td>ASC</td>
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<tr>
<td>17:00 - 18:00</td>
<td>ILRS GB</td>
</tr>
<tr>
<td>18:00 - 19:00</td>
<td>Key</td>
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- 15:00 - 15:30
- 15:30 - 17:00
- 17:00 - 18:00
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**LOCATION:**
- Mt Stromlo Observatory
- John Curtin School of Medical Research (JCSMR)
- JCSMR

**INTERNATIONAL WORKSHOP ON SPACE DEBRIS MANAGEMENT AND MITIGATION FRIDAY 9 NOVEMBER**

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- 15:00 - 15:30
- 15:30 - 17:00

**KEY**
- ASC: Analysis Standing Committee
- DFPSC: Data Formats and Procedures Standing Committee
- MSC: Missions Standing Committee
- NESC: Networks and Engineering Standing Committee
- TSC: Transponders Standing Committee
- GB: Governing Board (invitation only)
- JCSMR: John Curtin School of Medical Research

**BANQUET**
- National Arboretum

**ILRS GB WELCOME RECEPTION**
- JCSMR Foyer
- Sponsored by the ACT Government

**EOS Space Research Centre Telescope Tour**
- Includes BBQ at Mt Stromlo Observatory

**SESSIONS:**
- Opening Session
- Keynote Thomas Herring
  - Professor of Geophysics, MIT
- Session 1
  - SLR Contribution to Global Geodetic Observing System – A 2020 Perspective
- Session 3
  - Satellite Missions & Techniques for Geodetic Applications
- Session 6
  - Network Operations & Site Upgrades
- Session 8
  - Developments in Software & Automation
- Session 1
  - Continued
- Session 3
  - Continued
- Session 4
  - Characteristics of Retroreflector Arrays
- Session 7
  - Developments in SLR Techniques & Technologies
- Session 8
  - Continued
- Session 9
  - Lunar Laser Ranging & Deep Space Missions
- Session 2
  - Improvements in the SLR Product Quality & Precise Orbit Determination
- Session 4
  - Clinic Sessions
- Session 5
  - Sources of Systematic Errors
- Wrap-up & Close
- Mitigation & Remediation Session
- Conjunction Analysis & Collision Avoidance Session
- Sensors & Satellite Tracking Session

**LOCATION:**
- Mt Stromlo Observatory
- John Curtin School of Medical Research (JCSMR)
- JCSMR