# Program

**OFFICIAL WELCOME TO ASERA 2017**  
Aerial Function Centre, Building 10, Level 7

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<th>Time</th>
<th>WATTLE Room</th>
<th>THOMAS Room</th>
<th>BROADWAY Room</th>
<th>JONES Room</th>
<th>HARRIS Room</th>
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</thead>
</table>
| 9.30am - 9.40am | Vaille Dawson, Katherine Carson  
Teaching of argumentation and socio-scientific issues in three diverse schools  
Chair: Simon Taylor | Lihua Xu, Russell Tytler, Joseph Ferguson  
Embody experience of balance in solving problems with levers  
Chair: George Aranda | Gurinder Singh, Karen Haydock  
Understanding the role of student questioning in their argumentation: Moving beyond Toulmin's models  
Chair: Nuttawan Sirithon | Les Vozzo, Jessy Abraham  
Investigating a flipped classroom approach to foster learning and engagement in science and technology education at the undergraduate level  
Chair: Wendy Nielsen | Dorothy V Smith, Pamela J Mulhall, Richard F Gunstone, Christina E Hart  
What Teachers Should Know About Contemporary Aust Scientists, and Why?  
Chair: Teerana Chumsaeng |
| 9.45am - 10.25am | Simon Taylor  
Exploring a culture of co-operation and co-construction in year 9 science: New opportunities for science teachers and students working in flexible learning spaces  
Chair: Vaille Dawson | George Aranda, Joseph Ferguson  
Metarepresentational practices in an inquiry science classroom  
Chair: Lihua Xu | Nuttawan Sirithon, Ekgapoom Jantarakantee  
Developing grade 10 students' scientific explanations in the topics of forces, mass and laws of motion through an argument-driven inquiry approach  
Chair: Gurinder Singh Homi | Wendy Nielsen, Helen Georgiou, Pauline Jones, Annette Turney  
Multimodal resources in generating a digital explanation: Mapping the variety created by tertiary science students  
Chair: Les Vozzo | Teerana Chumsaeng, Ekgapoom Jantarakantee  
Using a context-based approach to develop grade 10 students' scientific explanation ability in an equilibrium unit  
Chair: Dorothy V Smith |
| 10.25am to 10.45am | MORNING TEA  
Breakout areas & Balcony |
| 10.45am - 11.30am | Yi-Fen Yeh  
Patterns of students’ diagram construction: A case of species extinction | Thepsathit Taruwan, Parichat Saenna  
Development of critical thinking for grade 11 students using problem-based learning with forensic science activities | Eunyoung Jeong  
The effect of introducing socio-scientific issues in a college biology course for pre-service science teachers | Shiho Miyake  
A study on creating a picture-story animation to communicate an environmental problem | Panisara Supanya, Jeerawan Ketsing, Ratcha Chaichana  
Grade 10 students’ scientific argumentation skills on microplastic waste |
| SESSION 3 | 10.30am - 11.30am | WATTLE Room | Physical and chemical change in textbooks: twenty years on!  
Chair: Linda Hobbs |
|---|---|---|---|
| 11.35am - 12.15pm | SESSION 4 | THOMAS Room | The parallel vision and creativity between science and art in the 20th century: A case study of paintings of Rene Magritte from the Copenhagen interpretation  
Chair: William P. Palmer |
| 12.20pm - 1pm | SESSION 5 | BROADWAY Room | Learning to teach out-of-field: Positioning, agency, continuity and expertise  
Chair: Hunkoog Jho |
| 1.50pm - 2.30pm | SESSION 6 | JONES Room | Science practical work of IER: nature, impact and improvement  
Chair: Léonie Rennie |
<p>| 2.30pm - 3.15pm | SESSION 7 | | LUNCH 1pm to 1.45pm - Breakout areas &amp; Balcony |</p>
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| 3.15pm to 3.30pm | Breakout areas & Balcony | WATTLE Room | Natchiya Tananushon, Jeerawan Ketsing, Wirasak Fungfuang  
Scaffolding grade 10 students' scientific conceptions on digestive system through the lens of epistemological and affective perspectives  
Chair: Nattakid Thongnoy |
| 3.35pm to 4.15pm |   | THOMAS Room | Maya Marcus, Sonia Saddiqui  
Integration with arts: Can STEAM education be used to attract and retain young women in STEM?  
Chair: David F. Treagust |
| 3.35pm to 4.15pm |   | BROADWAY Room | Kelly-Anne Jawerth, Jennifer Donovan  
Determining the most appropriate model to guide policy development for gifted and talented science students in NSW  
Chair: Sirinoot Khemkong |
| 3.35pm to 4.15pm |   | JONES Room | Nof Mohammed Albadi, Jean Harkins, John Mitchell O'Toole  
Saudi Year 10 Physics teacher and student perceptions of recent reforms in Secondary Science education  
Chair: Reece Mills |
| 3.35pm to 4.15pm |   | HARRIS Room | Leah Moor, B. Pearce  
Toward a Culturally Contextualised Australian Science Classroom: Addressing Post-colonial Tensions about Scientific Views  
Chair: Megan Ennes |
| 4.20pm to 5pm | 9    | WATTLE Room | Nattakid Thongnoy, Sasithep Pitiporntapin, Promote Chumnanpuen, Partorn Phongpajit  
Enhancing 10th Grade students’ scientific explanation of ecosystems using socio-scientific issue-based teaching  
Chair: Natchiya Tananushon |
| 4.20pm to 5pm | 9    | THOMAS Room | Agung W. Subiantoro, David F. Treagust, Kok-Sing Tang  
Development and implementation of socio-scientific issues-based learning in Indonesian secondary school biology: Students’ experience and perceptions on the issue of breastfeeding  
Chair: Maya Marcus |
| 4.20pm to 5pm | 9    | BROADWAY Room | Sirinoot Khemkong, Jeerawan Ketsing and Teerasak E-gobon  
Grade 11 gifted students’ scientific reasoning ability  
Chair: Kelly-Anne Jawerth |
| 4.20pm to 5pm | 9    | JONES Room | Reece Mills, Louisa Tomas, Brian Lewthwaite  
Using student-constructed animation to facilitate middle school students’ conceptual change in earth science  
Chair: Nof Mohammed Albadi |
| 4.20pm to 5pm | 9    | HARRIS Room | Megan Ennes, M. Gail Jones, Emily Cayton, Katherine Chesnutt, Pamela Huff  
Educator self-efficacy in informal science centers  
Chair: Leah Moore |
| 5.30pm to 7pm | 10 Fireside Chat | Building 10, Level 4 - School of Education |  
(use lifts to Level 4) |
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<tr>
<td>8.30am - 9.10am</td>
<td><strong>SESSION 1</strong></td>
<td>Paper withdrawn</td>
<td>Sung-Tao Lee, Ke-Hsuan Zeng</td>
<td>Rebecca Cooper, Karen Marango</td>
<td>Pattamporn Pimthong</td>
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<td></td>
<td>Deepa Dewali Chand, John Kenny, Sharon Fraser</td>
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<td>A study of science reading scaffolding effects for high school students toward science news texts in Taiwan</td>
<td>Establishing a school and science education partnership: A science teacher education perspective</td>
<td>The development of an activity for promoting pre-service teacher technological pedagogical content knowledge (TPCK)</td>
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<td>9.15am - 9.55am</td>
<td><strong>SESSION 2</strong></td>
<td>Keith Skamp</td>
<td>Saed Sabah</td>
<td>Joanne Burke,</td>
<td>Davis Baptiste Jn, David Palmer, Jennifer Archer</td>
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<td></td>
<td>Zeynep Yaseen</td>
<td>Teaching primary science constructively: Editor’s reflections on changes over 20 years of this research-based university text</td>
<td>Inquiry-based instruction in science classrooms in Qatar: findings from TIMSS 2015</td>
<td>Case studies of excellent science teachers’ beliefs and practice</td>
<td>Preservice teachers’ conceptions of how to increase students’ interest in science</td>
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<td>Student-generated analogies: Windows towards canonical understandings of science</td>
<td>Should primary children be taught the atomic-molecular theory of matter?</td>
<td>The South African science schooling curriculum on issues of scientific literacy in addressing climate change – a policy critique</td>
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<td>Sung-Tao Lee, Ying-Chun Chen</td>
<td>The explorations of frames and framing within science news regarding genetically modified organisms in Taiwan</td>
<td>Kudanaree Tanwannarak, Chatree Faikhama, Wachiryah Thong-as</td>
<td>Hayashi Nakayama, Tomokazu Yamamoto</td>
<td>Kanyarat Thanaphatwethpisit, Chittamas Suksawang, Boontana Wannalerse</td>
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<td>sung-pei chien, hsiao-hui lin, hsin-kai Wu</td>
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<td>Wachiryah Thong-asa</td>
<td>Designing a science education lesson: changing preservice teachers’ views on science lessons in undergraduate school</td>
<td>Thai science students’ conceptions of stoichiometry</td>
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**MORNING TEA** 10.40am to 11am - Breakout areas & Balcony

**POSTER PRESENTATION - SESSION 2 - Aerial Function Centre, Lobby Area**

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<td>8.30am - 9.10am</td>
<td>Hsiao-Hui Lin, Sieh-Hwa Lin, Hsin-Kai Wu</td>
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<td>Developing and Validating a Constructed-Response Assessment of Scientific Abilities: A Case of the Optics Unit</td>
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<td>Sung-Pei Chien, Hsiao-Hui Lin, Hsin-Kai Wu, Pai-Hsing Wu</td>
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<td>Examining the impacts of science teachers’ practice and beliefs about technology-based assessments on students’ performances: A hierarchical linear modelling approach</td>
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<td>Kanyarat Thanaphatwethpisit, Chittamas Suksawang, Boontana Wannalerse</td>
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### ASERA AGM

**11.50am to 12.45pm - THOMAS Room**

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<th>Session 4</th>
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| **Karen Marangio** | **Coral Campbell,**
**Victorian teachers of** | **Chris Speldewinde,**
| **psychology survey:** Psychology | **Christine Howitt,**
| is a science? Most definitely! | **Amy MacDonald**
| **Chair: Tracey-Ann Palmer** | **Early childhood teachers’**
| | **STEM pedagogy and practices:**
| | **A snapshot**
| | **Chair:**
| | **Kimberley Pressick-Kilborn**

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<th>Session 5</th>
<th>1.50pm - 2.30pm</th>
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| **Mareike Frevert,** | **Worawan Phanpreeda,**
**David-Samuel Di Fuccia** | **Sasithep Pitiporntapin,**
**Contemporary science in** | **Pramote Chumnanpuen-**
| **chemistry teacher education** | **Suradet Sritha**
| **Chair: Tim Strohfeldt** | **Enhancing of Grade 10**
| | **students’ environmental**
| | **action using socio-scientific**
| | **issues-based teaching.**
| | **Chair:**
| | **Willeke Rietdijk**

### LUNCH

**12.50pm to 1.45pm - Breakout areas & Balcony**

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<tr>
<th>Session 6</th>
<th>2.35pm - 3.16pm</th>
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</table>
| **Mareike Frevert,** | **Joseph Ferguson,**
**David-Samuel Di Fuccia** | **Sasithep Pitiporntapin,**
**Contemporary science in** | **N. Yutakom,**
| **chemistry teacher education** | **T. D. Sadler**
| **Chair: Tim Strohfeldt** | **Case studies of the development**
| | **of pre-service science teachers’**
| | **understandings and practices of**
| | **socio-scientific issues (ssis)-**
| | **based teaching through an**
| | **online mentoring program**
| | **Chair:**
| | **Mareike Frevert**

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**N. Yutakom,** | **Andri Christodoulou,**
**T. D. Sadler** | **Marcus Grace,**
| **Case studies of the development** | **Ralph Levinson**
| **of pre-service science teachers’** | **Mapping controversies: a**
| **understandings and practices of** | **pedagogical approach for**
| **socio-scientific issues** | **communicating about socio-**
| | **scientific issues**
| | **Chair:**
| | **Worawan Phanpreeda**

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| **Bette Davidowitz,** | **James P. Davis,**
| **Marissa Rollnick,** | **Alberto Belloccchi**
| **Marietjie Potgieter** | **Using a sketch map as a**
| **A comparison between the** | **conceptual metaphor: A**
| | **micro-sociological perspective**
| | **Chair:**
| | **Kathryn Garthwaite**

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| **Anne T Galvin,** | **James P. Davis,**
| **Rekha B Koul** | **Alberto Belloccchi**
| | **Impacts of NAPLAN**
| | **preparation impacting on**
| | **the teaching of science to**
| | **Stage 3 students in New**
| | **South Wales schools?**
| | **Chair:**
| | **Michael Tynan**

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| **Marissa Rollnick,** | **Andri Christodoulou,**
| **Marietjie Potgieter** | **Marcus Grace,**
| **A comparison between the** | **Ralph Levinson**
| | **knowledge bases of chemists**
| | **and teachers for teaching**
| | **organic chemistry**
| | **Chair:**
| | **Joseph Ferguson**

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| | **Stage 3 students in New**
| | **South Wales schools?**
| | **Chair:**
| | **Michael Tynan**
### Session 7

**WATTLE Room**
- Tim Strohfeldt, Margaret Marshman
- Partnering with preservice teachers for a school science extension program
  - Chair: Mareike Frevert

**THOMAS Room**
- Siriya Thongloleart, Pattamaporn Pimthong, Aphisit Songsasen
- The study of 10th Grade students’ conceptions in forming of ionic bonding and motivational beliefs through conceptual change approach: analogy and application software (4d elements®)
  - Chair: Joseph Ferguson

**BROADWAY Room**
- Kian Keong Aloysius, Ong Ai Choo Jennifer, Yeo Kim Chwee Daniel, Tan Poh Hiang
- Investigating experienced teachers’ pedagogical content knowledge (PCK) in representation-based instruction: A sociocultural perspective
  - Chair: Worawan Phanpreeda

**JONES Room**
- Kathryn Garthwaite
- Developing a model to analyse secondary students’ perceptions of nature in relation to a biodiversity rescue
  - Chair: James P. Davis

**HARRIS Room**
- Deborah Corrigan, Debra Panizzon
- Exploring the role of STEM education in relation to innovation and entrepreneurship as economic change agents
  - Chair: Anne T Galvin

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**Afternoon Tea**
- 4pm to 4.20pm - Breakout areas & Balcony

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**Conference Dinner**
- 7pm to 10pm - Dockside, Cockle Bay

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**Conference Dinner**

The Conference Dinner is to be held in beautiful Sydney Harbour at Dockside, Cockle Bay at the rooftop venue of L’Aqua. It is a 20 minute walk from the conference venue, along an interesting route – the old Goods Station and taking you past the International Conference Centre.

*Canapes and Pre-dinner drinks will be served at 7pm out on the balcony overlooking spectacular Darling Harbour.*
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<td>9.15am – 9.55am</td>
<td>Jim Scott Assessing the impact of formative practices on science learning outcomes: A mixed methods study Chair: Ken Silburn</td>
<td>Caroline McCarty What influence do science teachers have in creating positive learning experiences for learners of science? Chair: Dylan Roche</td>
<td>Donna King, Terry Lyons, Les Dawes, Tanya Doyle, Megan O’Loughlin Affordances and constraints of pre-service teachers’ design of STEM Resources on Demand (STEMROD) Chair: David Jeffries</td>
<td>Jan van Driel, Rebecca Cooper Analysing science teachers’ pedagogical content knowledge: the second PCK summit Chair: Kathleen Hayes</td>
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<td>10am – 10.40am</td>
<td>Ken Silburn Engagement of STEM: “Stuff that works” Chair: Jim Scott</td>
<td>Dylan Roche Making reliable judgments of quality in senior science assessments Chair: Caroline McCarty</td>
<td>David Jeffries, David Curtis STEM subject choice in Year 12: the influence of demographic characteristics, attitudes towards science and achievement Chair: Donna King</td>
<td>Kathleen Haynes, Merryn McKinnon John Cripps Clark Teacher’s perspectives on the role of collaborative partnerships in secondary science education Chair: Jan van Driel</td>
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<tr>
<td>11.10am – 11.50am</td>
<td>George Aranda, Joseph Ferguson, Russell Tytler and Radhika Gorur The roles of drawing in reasoning and learning in the science classroom Chair: Peter Hubber</td>
<td>Gillian Kidman, Niranjan Casinader Frameworks guiding the teacher’s work in scientific inquiry Chair: Ewa Biviano</td>
<td>Sally Birdsell Bev France Students’ beliefs about pest animals: An international comparative study Chair: Susanne Digel</td>
<td>Linda Hobbs, Scott Mcleod, Barry Plant Sustaining STEM-based reforms in secondary schools: Insights into successful implementation Chair: Wan Ng</td>
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<tr>
<td>11.55am – 12.35pm</td>
<td>Peter Hubber, Christine Preston Investigating representational pedagogies for learning electricity in Year 6 Chair: George Aranda</td>
<td>Ewa Biviano, Gillian Kidman When is a chemistry experiment an investigation? Chair: Niranjan Casinader</td>
<td>Susanne Digel, David Treaust, Alexander Kauertz, Patrick Löffler, Jochen Scheid Beyond content knowledge - how modelling skills and student concepts interrelate in context-based tasks Chair: Sally Birdsell</td>
<td>Wan Ng, Jennifer Fergusson State of Years 9 and 10 students’ views of science and science education Chair: Linda Hobbs</td>
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**MORNING TEA** 10.45am to 11.05am · Breakout areas & Balcony

*George Aranda, Joseph Ferguson, Russell Tytler and Radhika Gorur*

*Gillian Kidman, Niranjan Casinader*

*Sally Birdsell*

*Linda Hobbs, Scott Mcleod, Barry Plant*

*Jane Hunter* Principals leading the STEM agenda in Australian primary school education: Influence, tone and responsibility Chair: Kathryn Paige

*Peter Hubber, Christine Preston*

*Ewa Biviano, Gillian Kidman*

*Susanne Digel, David Treaust, Alexander Kauertz, Patrick Löffler, Jochen Scheid*

*Wan Ng, Jennifer Fergusson*

*Kathryn Paige, David Lloyd* Fresh water literacies: an interdisciplinary study with primary teachers and researchers Chair: Jane Hunter
LUNCH  12.40pm to 1.30pm - Breakout areas & Balcony

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<td><strong>Kathy Smith</strong>&lt;br&gt;Quality learning- teachers changing their practice&lt;br&gt;&lt;b&gt;Chair: Hye-Eun Chu&lt;/b&gt;</td>
<td><strong>Annette Hilton, Geoff Hilton</strong>&lt;br&gt;Proportional reasoning for science understanding: A science curriculum audit&lt;br&gt;&lt;b&gt;Chair: Onanong Inta&lt;/b&gt;</td>
<td><strong>Peter Aubusson, P.F. Burke, Kimberley Pressick-Kilborn</strong>&lt;br&gt;Barriers to teaching of primary science and technology&lt;br&gt;&lt;b&gt;Chair: Tracey-Ann Palmer&lt;/b&gt;</td>
<td><strong>Leissa Kelly, Mary Gibson, Merryn Dawborn-Gundlach</strong>&lt;br&gt;Collaborative partnerships between Specialist Science and Technology Centres and Universities&lt;br&gt;&lt;b&gt;Chair: Zeynep Yaseen&lt;/b&gt;</td>
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<td><strong>Hye-Eun Chu, Kok Siang Tan, Daniel Kimchwee Tan</strong>&lt;br&gt;Investigating factors for implementing assessment innovation in science classrooms&lt;br&gt;&lt;b&gt;Chair: Kathy Smith&lt;/b&gt;</td>
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<td><strong>Kimberley Pressick-Kilborn, Tracey-Ann Palmer</strong>&lt;br&gt;Which way forward for teaching primary science and technology? Cases of generalist and specialist teachers in NSW schools&lt;br&gt;&lt;b&gt;Chair: Peter Aubusson&lt;/b&gt;</td>
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