ISSW35:

SHOCK WAVES DOWN UNDER

PROGRAM BOOK

05 - 14

JULY 2025

The 35th International Symposium on Shock Waves

Hawken Engineering Building (50),
Advanced Engineering Building (49)

The University of Queensland, St. Lucia Campus
Brisbane, Australia.

Contents

A Welcome Message from the Co-chairs

The Chairs of ISSW35 and the local organising committee welcome all delegates and accompanying visitors to the latest version of the Symposium, Brisbane July 2025.

This is the third time that the Symposium will be held in Australia, following the cancellation of ISSW33 in 2021 due to COVID and the highly successful ISSW34 hosted by Korea in 2023. We are delighted to see the large number of registrations encompassing a wide range of multi-disciplinary shock wave applications from diverse cultural and generational backgrounds. We hope that personal interactions between leading and nascent researchers from around the world will inspire productive collaboration and generate new ideas. The accumulated knowledge and wisdom of shock waves is not entirely contained in the archival literature or generated via AI, and it also grows through creative personal interactions in spontaneous and unpredictable ways. We believe that these meetings play an important role in the further development of our science, and have made every effort to organise an enjoyable and productive week. We acknowledge the enthusiastic team of volunteers who are giving generously of their time to ensure smooth operations before, during and after the event!

The meeting will be held on the University of Queensland St Lucia Campus, nestled in a loop of the Brisbane River easily accessible by road, bus and ferry ('city cat') from the city and surrounding suburbs. A full social day out on Moreton Island has been organised for the Wednesday, during which we hope for fair weather, usually a good bet at this time of year, but beyond our control. Wet weather contingency plans are in place. The meeting will be preceded by a workshop on hypersonic shock tube technology at the UQ Campus on the Saturday, and followed by workshops on free flight wind tunnel experimentation and re-entry emission signatures hosted by the University of Southern Queensland at their Toowoomba Campus on the following Monday. A partner's program has been organised for visits to the Lone Pine Koala sanctuary on the Brisbane River, and to the Outback Spectacular show at the Gold Coast.

We look forward to meeting you all in Brisbane.

ISSW35 LOC Co-chairs.

Richard Morgan, UQ

David Buttsworth, UniSQ

Harald Kleine, UNSW

Past ISSWs

No.	Year	City	Country
1st	1957	Boston	USA
2nd	1958	Palo Alto	USA
3rd	1959	Fort Monroe	USA
4th	1961	Aberdeen	Scotland
5th	1965	White Oak	USA
6th	1967	Freiburg	Germany
7th	1969	Toronto	Canada
8th	1971	London	UK
9th	1973	Palo Alto	USA
10th	1975	Kyoto	Japan
11th	1977	Seattle	USA
12th	1979	Jerusalem	Israel
13th	1981	Buffalo	USA
14th	1983	Sydney	Australia
15th	1985	Berkeley	USA
16th	1987	Aachen	Germany
17th	1989	Bethlehem	USA
18th	1991	Sendai	Japan
19th	1993	Marseille	France
20th	1995	Pasadena	USA
21st	1997	Great Keppel Island	Australia
22nd	1999	London	UK
23rd	2001	Fort Worth	USA
24th	2003	Beijing	China
25th	2005	Bangalore	India
26th	2007	Gottingen	Germany
27th	2009	St. Petersburg	Russia
28th	2011	Manchester	UK
29th	2013	Wisconsin	USA
30th	2015	Tel Aviv	Israel
31st	2017	Nagoya	Japan
32nd	2019	Singapore	Singapore
33rd	2021	*Cancelled* *(International Colloquium on Shock Waves)*	Australia
34th	2023	Daegu	Korea
35th	2025	Brisbane	Australia

Overview of ISSW35: Shock Waves Down Under

Details of the 35th International Symposium on Shock Waves	
Name	The 35th International Symposium on Shock Waves (ISSW35)
Date	July 5th (Sat) to July 14th (Mon), 2025.
Buildings	Hawken Engineering Building (50) and Advanced Engineering Building (49)
Location	The University of Queensland, St Lucia Campus, Brisbane.
Hosted by	The University of Queensland; The University of New South Wales, Canberra; The University of Southern Queensland.

Local Organising Committee	
Co-chairs	Professor Richard Morgan; Associate Professor Harald Kleine; Professor David Buttsworth
Co-editors	Dr David Gildfind, Associate Professor Harald Kleine; Associate Professor Rowan Gollan

Dr Chris James	The University of Queensland	Dr Yu Liu	The University of Queensland
Dr David Gildfind	The University of Queensland	Dr Ramprakash Ananthapadmanaban	The University of Queensland
Dr Rowan Gollan	The University of Queensland	Mr Toby van den Herik	The University of Queensland
Professor Timothy McIntyre	The University of Queensland	Mr Matthew Uren	The University of Queensland
Dr Tamara Sopek	The University of Queensland	Ms Daisy-May Joslyn	The University of Queensland
Associate Professor Fabian Zander	The University of Southern Queensland	Mr Robert Hawken	The University of Queensland
Associate Professor Ingo Jahn	The University of Southern Queensland	Mr James Wallington	The University of Queensland

International Advisory Committee

Nicholas Apazidis	Sweden	Stuart Laurence	USA
Elangannan Arunan	India	Seokbin Lim	USA
Joanna M. Austin	USA	Achim Loske	Mexico
Gabi Ben-Dor	Israel	Frank Lu	USA
Riccardo Bonazza	USA	Xisheng Luo	China
Martin Brouillette	Canada	Kazuo Maeno	Japan
Bianca Capra	Australia	Matthew McGilvray	UK
Kazuhisa Fujita	Japan	David Mee	Australia
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Victor Golub	Russia	Rho Shin Myong	Korea
Jagadeesh Gopalan	India	Hiroki Nagai	Japan
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Ronald Hanson	USA	Marianne Omang	Norway
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Hamid Hosano	Japan	Randall Paton	South Africa
Ozer Igra	Israel	Allan Paull	Australia
Jeff Jacobs	USA	Eric L. Petersen	USA
In-Seuck Jeung	Korea	Oren Sadot	Israel
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Zonglin Jiang	China	Akihiro Sasoh	Japan
Georges Jourdan	France	Friedrich Seiler	Germany
Valeriy Kedrinskiy	Russia	Kazuyoshi Takayama	Japan
Boo Cheong Khoo	Singapore	Evgeny Timofeev	Canada
Heuy Dong Kim	Korea	Setoguchi Toshiaki	Japan
Harald Kleine	Australia	Zbigniew Walenta	Poland
Konstantinos Kontis	UK	Minoru Yaga	Japan
Irina Krassovskaya	Russia	Subith Vasu	USA

Program at a Glance (Page A)

See main program for locations / room information

Time	Saturday (July 5th)	Time	Sunday (July 6th)	Time	Monday (July 7th)	Time	Tuesday (July 8th)	Time	Wednesday (July 9th)
				8:00-8:20	Registrations Location: Building 49, AEB			8:00-17:00	**Social Day at Tangalooma (Moreton Island)** (See page 34 for details)
				8:20-9:00	Welcome Session				
8:30-9:20	Registrations Location: Outside 50-T203					8:30-9:40	**Plenary 3** Professor Hideyuki Tanno		
9:20-11:00	**UQ Short Course* Session 1** Introduction to Hypersonic Shock Tunnels and Expansion Tubes			9:00-10:00	**Plenary 1** ***The Ray Stalker Lecture*** Emeritus Professor Hans Hornung				
				10:00-11:00	Technical Sessions	9:40-11:00	Technical Sessions		
11:00-11:30	Coffee Break			11:00-11:30	Coffee Break	11:00-11:30	Coffee Break		
11:30-13:10	**UQ Short Course Session 2** Optical Diagnostics in Shock Tunnels and Expansion Tubes			11:30-12:50	Technical Sessions	11:30-12:50	Technical Sessions		
13:10-14:10	Lunch			12:50-13:50	Lunch / SWI Lunch	12:50-13:50	Lunch		
14:10-15:40	**UQ Short Course Session 3** Applications of Hypersonic Shock Tunnels and Expansion Tubes	14:00-17:00	**ISSW35 Welcome Reception and Registrations** Location: UQ Lakes Amphitheatre Refer to map on page 9	13:50-14:50	**Plenary 2** ***The Irvine Glass Lecture*** Associate Professor Sally Bane	13:50-14:50	**Plenary 4** ***The Paul Vieille Lecture*** Professor Matthew McGilvray		
				14:50-15:20	Coffee Break	14:50-15:20	Coffee Break		
15:40-16:20	Coffee Break			15:20-16:20	Technical Sessions	15:20-16:20	Technical Sessions		
16:20-17:40	**UQ Short Course Session 4** Modelling Hypersonic Flows in Support of Experiments			16:20-17:20	Optional Laboratory Tours	16:20-18:00	Poster Session with Drinks		
						18:00-21:00	IAC and Plenary Speakers Dinner		

***See page 37 for details on UQ Short Course on Hypersonic Shock Tube Technology on Saturday 5 July.**

Program at a Glance (Page B) *See main program for locations / room information*

Time	Thursday (July 10th)	Time	Friday (July 11th)	Time	Saturday (July 12th)	Time	Sunday (July 13th)	Time	Monday (July 14th)
8:30-9:40	**Plenary 5** Professor Sean O'Byrne	8:40-10:00	Technical Sessions		*No conference activities happen on this weekend.*			9:30-10:00	**UniSQ Workshops †** Welcome Tea and Coffee
9:40-11:00	Technical Sessions	10:00-11:00	**Plenary 7** Professor Oren Petel					10:00-16:00	**Workshop** Re-entry Emission Signatures / **Workshop** Wind Tunnel Free-flight Testing
11:00-11:30	Coffee Break	11:00-11:30	Coffee Break						
11:30-12:50	Technical Sessions	11:30-12:30	**Plenary 8** Professor Vincent Wheatley						
12:50-13:50	Lunch / SWJ Lunch	12:30-13:50	Lunch						
13:50-14:50	**Plenary 6** Professor Ivett Leyva	13:50-14:50	Technical Sessions						
14:50-15:20	Coffee Break	14:50-15:20	Coffee Break						
15:20-17:00	Technical Sessions	15:20-15:40	ISSW35 Closing Remarks						
18:00-21:00	Conference Banquet								

† **See page 38 for details on the UniSQ (Toowoomba) Workshops on Monday 14 July.**

ISSW35 Venues

UQ Lakes (Dr Mary Mahoney AO) Amphitheatre, UQ St. Lucia Campus

Location of the ISSW35 Welcome Reception


The Advanced Engineering Building (AEB, Building 49), UQ St. Lucia Campus

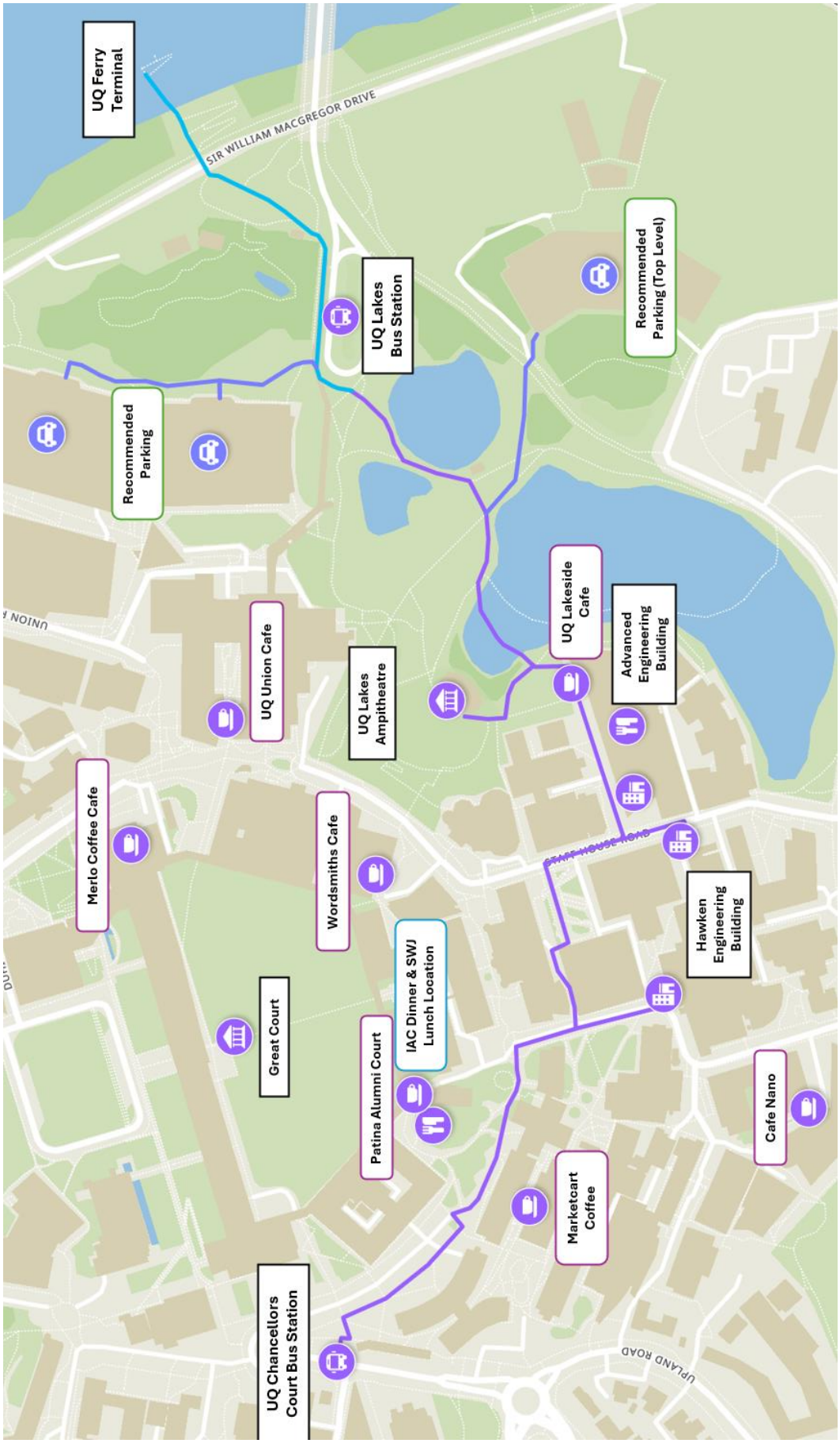
Location of Session Room 39-313A, Lunches, Coffee Breaks, and Some Plenaries (49-200)


The Hawken Engineering Building (Building 50), UQ St. Lucia Campus

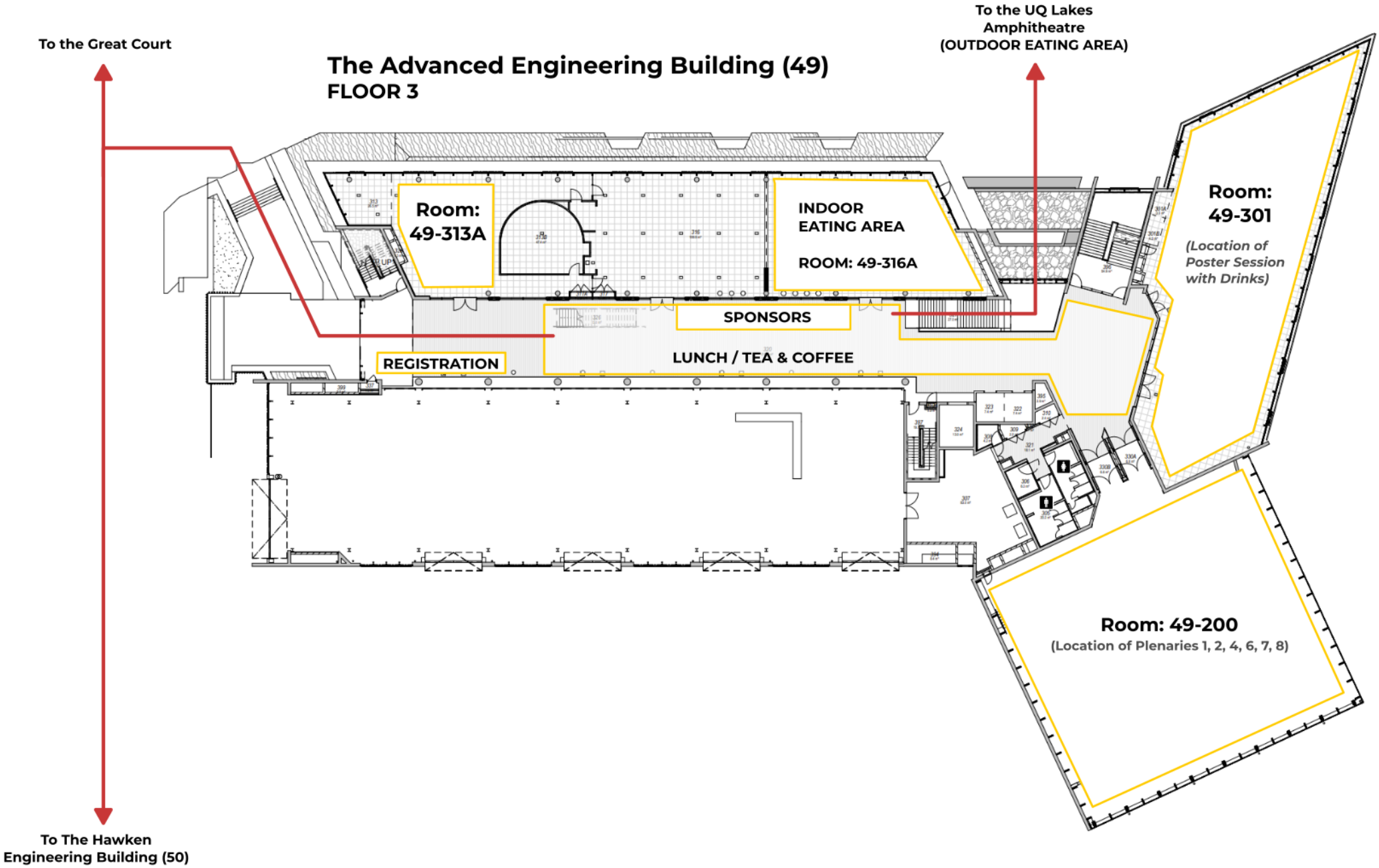
Location of Session Rooms 50-N201, 50-N202, 50-T103, 50-T105, 50-S201, 50-C207 and Some Plenaries (50-T203)


Maps of these spaces can be found on the following pages

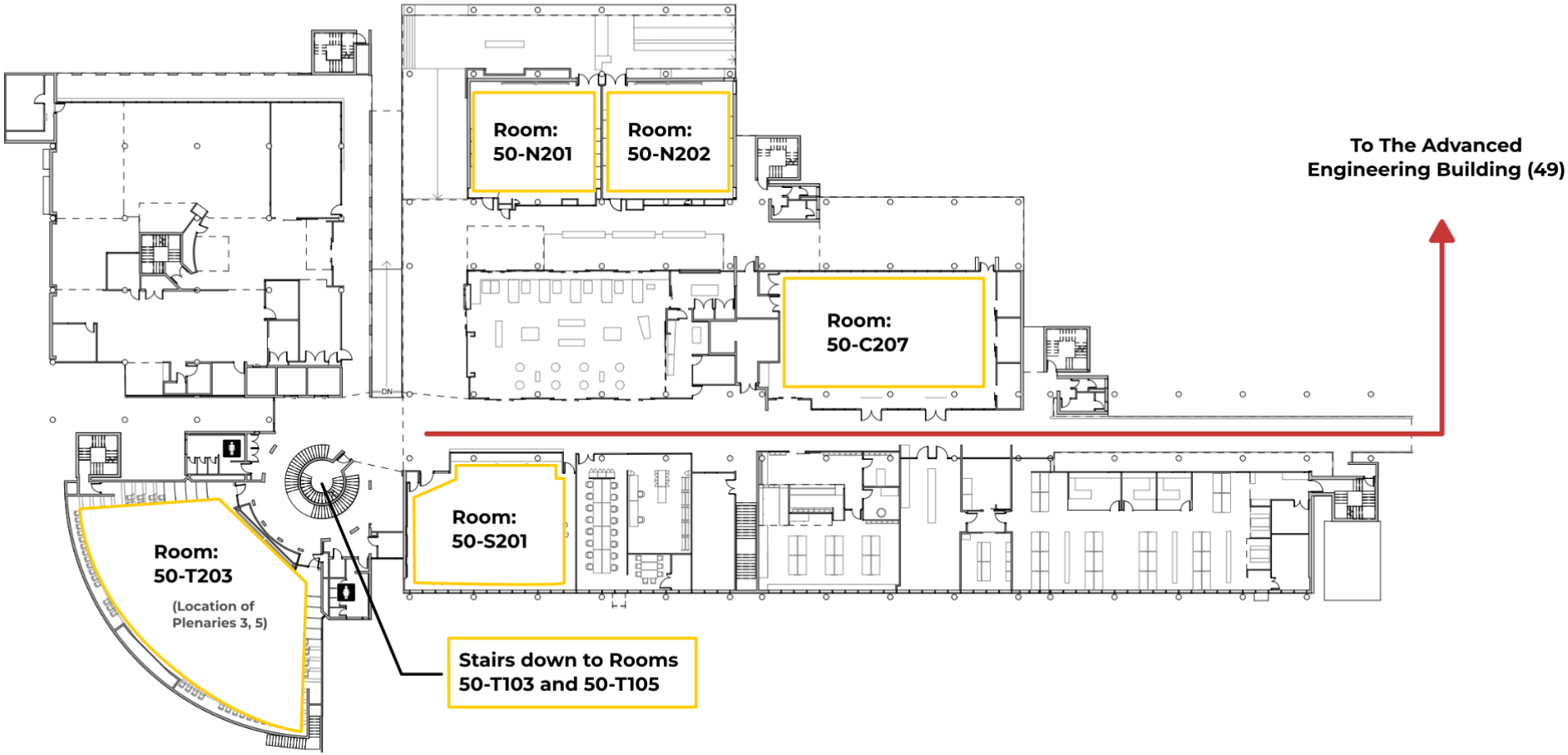
Conference Maps



The Advanced Engineering Building (49)
FLOOR 3



The Hawken Engineering Building (50)
FLOOR 2



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Photron's high-speed imaging systems are transforming shockwave research by capturing data in breathtaking detail. The latest range of cameras, including the Pharsighted E9 150S — boasting a total system throughput of 150 gigapixels-per-second— allows engineers and scientists to visualize shockwave formation, propagation, and interaction with materials. Photron's precision timing, unrivalled light sensitivity and high-resolution sensors deliver the clarity and accuracy needed for the next advancements in shsock research.

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Other Sponsors

Plenary Speakers

Emeritus Professor Hans Hornung

California Institute of Technology

Former director of GALCIT - Graduate Aerospace Laboratories

Plenary 1: The Ray Stalker Lecture (Monday 7 July, Room 49-200, 9:00-10:00)

Recent developments in high-enthalpy ground testing

Since this is the Stalker Lecture, I will begin by reminiscing about the golden decade during which the team Stalker, Sandeman, Hornung collaborated at ANU. Then I will outline four selected advances in the use of free-piston-driven shock tunnels. Each of these has improved features of their utility. One has even shown high-enthalpy facilities to be applicable to the study of problems for which, in the early days, we had never thought they could be used.

Associate Professor Sally Bane

Purdue University

Director of Laboratory & Hands-On Education in the School of Aeronautics and Astronautics

Plenary 2: The Irvine Glass Lecture (Monday 7 July, Room 49-200, 13:50-14:50)

Advancements in Active Control of Shock Wave/Boundary Layer Interaction

Shock wave/boundary layer interactions (SWBLI) remain a critical challenge in high-speed aerodynamic applications, often leading to flow separation, increased drag, and unsteady loading. This presentation reviews recent advancements in active control of SWBLI, beginning with established techniques and then exploring emerging plasma-based methods, which offer fast response times, low mass addition, and the potential for real-time flow adaptation. Experimental and computational studies demonstrating the efficacy of various plasma actuator configurations will be highlighted, including ongoing work using pulsed plasma actuators at Purdue University. The talk aims to synthesize key findings, identify remaining challenges, and outline future directions for integrating plasma-based control into practical high-speed flow systems.

Professor Hideyuki Tanno

Japan Aerospace Exploration Agency (JAXA)

Former manager of the JAXA-HIEST (High-Enthalpy Shock Tunnel)

Plenary 3 (Tuesday 8 July, Room 50-T203, 8:30-9:40)

Insights and Applications from high-enthalpy Shock Tunnel Studies

This presentation explores key experimental advancements achieved using the High-Enthalpy Shock Tunnel HIEST at JAXA, which enables testing under conditions simulating low Earth orbit reentry by achieving up to 25 MJ/kg stagnation enthalpy and 150 MPa stagnation pressure. Originally developed for studying aerodynamic stability of winged reentry vehicles, HIEST has since supported broader research into scramjet propulsion and hypersonic cruise systems. A major contribution is the development of a novel free-flight measurement technique using onboard accelerometers, which enabled unprecedentedly accurate determination of pitching moments in real-gas hypersonic flows. Furthermore, HIEST has contributed significantly to understanding boundary-layer transition under high-enthalpy conditions, demonstrating enthalpy-induced delays in disturbance growth, especially in Mack-mode instabilities. These insights highlight the importance of oxygen dissociation in transition phenomena. Another key finding addresses the anomalously high heat flux observed in shock tunnel tests, which was traced to radiative heating by trace metal atoms in high-enthalpy flows, complicating CFD validation. HIEST's capability to test largescale models has been instrumental in uncovering these effects. Despite these achievements, challenges remain in applying aerodynamic stability data to vehicle design, correcting radiative anomalies, clarifying delayed transition mechanisms, and improving mixing for scramjet combustion. Overall, the talk emphasizes how empirical research in high-enthalpy flows informs future aerospace vehicle design and calls for further innovation to realize next-generation hypersonic technologies.

Professor Matthew McGilvray

The University of Oxford

Head of the Oxford Hypersonics Group

Plenary 4: The Paul Vieille Lecture (Tuesday 8 July, Room 49-200, 13:50-14:50)

Development, Experiments and A-posteriori Modelling of Shock Tubes

The shock tube is an experimental facility used to explore fundamental physics of shock waves and to assist in the development of engineering systems. The shock tube was developed in the 1890's by Paul Marie Eugene Vieille to understand shock wave phenomena for explosives, leading to the first experimental verification of the mathematical theory of Riemann and Hugoniot on the existence of shock waves. Although the shock tube was simple in its conception, it has stood the test of time as a useful and flexible tool for scientists and engineers. This talk will describe the conception, development and commissioning of the Oxford free-piston driven T6 multimode shock tunnel facility, which ran its first test in 2017. An overview will be provided of key experiments and development of new experimental techniques in the T6 shock tube. Finally, an overview will be given of the novel and computationally efficient numerical methods developed in Oxford for a-posteriori modelling of shock tubes and their application to shock tube experiments.

Professor Sean O'Byrne

Australian National University

Professor and Cluster Lead, Aerospace

Plenary 5 (Thursday 10 July, Room 50-T203, 8:30-9:40)

Nonintrusive Diagnostics for High-Speed Flight Tests

Laser diagnostics have consistently demonstrated their utility in a laboratory environment since the 1960s, but have been relatively rare in flight tests, where the emphasis is still very much on surface measurements. There are a number of flow properties associated with in-flow turbulence, rarefied gas behaviours and internal energy modes of molecules that are best investigated with laser-based or other types of non-intrusive flow diagnostic techniques and that need to be investigated in a flight environment for comparison with ground-based tests. The speed and accuracy of these methods also show their value as sensors in engine or vehicle control systems. This lecture will discuss some actual and potential flight test diagnostic experiments, and some of the valuable information they can potentially provide.

Professor Ivett Leyva

Texas A&M University

Head of the Aerospace Engineering Department

Plenary 6 (Thursday 10 July, Room 49-200, 13:50-14:50)

Perspectives on Hypersonics from my Experiences at AFOSR and Academia

In this brief I will talk about my perspectives on hypersonic fundamental research from my experience as a former program officer for the Air Force Office of Scientific Research at the Air Force Research Lab from the US Air Force. Then, a recent area of my research will be discussed. In the last decade, there have been observations of center heat streaks on swept geometries like HiFIRE5. The observations have been numerical, experimental and in flight. The exact origin of the heat streaks has not been studied independently. It is likely that the heat streaks are a combination of factors like the geometry itself (swept) and shock curvature. My research group has created a set of swept wedges and analyzed them numerically and experimentally. The team is aiming to measure and isolate the effects of shock curvature, swept geometry, and natural instability modes on the heat streaks. The ongoing results will be discussed.

Professor Oren Petel
Carleton University
Head of the Impact Dynamics Research Group

Plenary 7 (Friday 11 July, Room 49-200, 10:00-11:00)

Advances in Experimental Methodologies to Investigate Blast and Impact Trauma

Blast- and impact-induced head trauma may result in neurodegeneration that has been linked to devastating health outcomes. While protective equipment is designed to reduce the risk of injury, the primary mechanisms and critical thresholds responsible for such injuries remain unresolved. The research in my lab has focused on the development of new experimental tools and techniques to advance injury evaluation methodologies. This research program seeks to fill a number of knowledge gaps in the field of injury biomechanics surrounding impact trauma. Our primary focus has been the advancement of time-resolved in situ measurement techniques using our custom high-speed X-ray imaging system, and the development and validation of advanced head surrogates for blast and impact trauma. Our multidisciplinary research approaches have included a series of ex vivo and in vitro studies combining mechanical and histological investigations in an effort to resolve injury mechanisms and thresholds. In this presentation, I will provide a high-level overview of our injury biomechanics research and how it aims to bridge shock physics and the broader injury biomechanics field.

Professor Vincent Wheatley
The University of Queensland (UQ)
Co-Director of UQ's Centre for Hypersonics

Plenary 8 (Friday 11 July, Room 49-200, 11:30-12:30)

Development of an Accelerator Scramjet for Access-to-space

System level studies have shown that utilizing hypersonic air-breathing propulsion to power launch vehicle stages could lead to a more economical and flexible access-to-space system. The three-stage rocket-scramjet-rocket system that emerged from these studies requires a fixed geometry accelerator scramjet capable of providing thrust from approximately Mach 5 to 10. While scramjets have successfully operated over small Mach number ranges, physically realising such an accelerator scramjet requires major challenges to be overcome. These include: the design of an efficient inlet that produces acceptable combustor entry conditions over the entire trajectory; the ability to initiate and hold efficient dual-mode combustion at the low end of the trajectory without the aid of physical flame holders that would compromise high Mach number operation; and achieving the exceptional combustion efficiencies required to overcome losses during high Mach number operation. The multi-decade effort at the University of Queensland to overcome these challenges will be presented, along with experimental validation of the resulting accelerator scramjet at the mid-point of its trajectory, and computational predictions of its performance at the extremes.

Detailed Program

ISSW35 Main Program

Monday 7 July							
08:20 - 09:00	Room: 49-200 **Welcome Remarks and Welcome to Country**						
09:00 - 10:00	Room: 49-200; Chair: Prof Richard Morgan **Plenary 1: Em Prof Hans Hornung, Recent developments in high-enthalpy ground testing**						
Mon 7 July 10:00 - 11:00							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Propulsion	**Facilities and Instrumentation**	**Shock Waves in Solids**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Chemically Reactive Flows**	**Shock-Vortex Interaction**
	Chair: Jeong-Yeol Choi	Chair: Eric Petersen	Chair: Michael Liverts	Chair: Ravi Kumar Peetala	Chair: Dan Igra	Chair: Yoshitaka Sakamura	Chair: Riccardo Bonazza
10:00	*Fluidic Thrust Vectoring of Micro Nozzles in Space Application (326)* *(S) Arnab Kumar Das, Tapan Mankodi, Ujjwal K. Saha*	*Commissioning Experiments in the Oxford Cold Driven Expansion Tube CXT (52)* *(S) Omar Valeinis, Eric Won Keun Chang, Tobias Hermann, Matthew McGilvray*	*Effect of shock wave on the structural and optical properties of MoS2 layered compound (80)* *Dr. Jayaram Vishakantaiah, Kavitha Jayaram, Nagaraj Mariyappa*	*Effects of sweep angle on hypersonic three-dimensional shock wave/turbulent boundary layer interactions (22)* *Xinliang Li, Ji Zhang*	*Numerical Investigation of Sonic Jet Injection in a Supersonic Crossflow with Cavity (237)* *(S) Shailesh Kumar Singh, Arun Kumar Rajagopal, Srinivas M V V*	*Extension of a Chemical Reaction Model in the Fokker-Planck Framework and its Application to Supersonic Flows (67)* *Leo Basov, Georgii Oblapenko*	*Influence of Aspect Ratios on Expansion Wave Diffraction over Cavities (296)* *Rajesh G, S Vishnu Prasad, Preetha Pushkarni P, Reia Ramkumar, Anbu Serene Raj C, Mano M, Vinoth P*
10:20	*Effect of Intake Shape on Supersonic Pulsed Laser Propulsion (324)* *(S) Taichi Kumazaki, Kohei Shimamura*	*Heated Hydrogen Driver Upgrade for the HYPULSE Shock Tunnel Facility (265)* *Adrian Flores, Matthew Bush, Joseph Jewell*	*Experimental and Numerical Study on the Effect of Incident Shock Stress Waves on Crack Propagation in Blasting (195)* *(S) Geunsoo Jeon*	*Direct Numerical Simulation of a Boundary Layer Induced by a Hypersonic Fluid Flow over a Wall (11)* *Amareshwara Sainadh Chamarthi, Josette Bellan*	*On the extremely Fast Vibrational Energy Relaxation between CO and H2O: An Experimental Study (55)* *Dong He, Qizhen Hong, Renjie Li, Tielou Liu, Fei Li, Quanhua Sun, Ting Si, Xisheng Luo*	*Shock Processing of CdS nanostructure and Computer Simulation with Machine Learning (76)* *Kavitha Jayaram, Jayaram V*	*Experimental Study on a Head-On Collision of Compressible Elliptical Vortex Rings. (387)* *(S) Rijin Rajan, Shakti Kumar, Pawan Kumar Karn, Kamal Poddar, Debopam Das*
10:40	*Exploring Three-dimensional Compression Fields for the Design of Streamline-traced Hypersonic Inlets (264)* *Rowan Gollan*	*Measurement of Film Cooling Effectiveness in Shock Tunnel for Transonic Flow over a Flat Plate by Multi-Test Strategy (107)* *Wei Zeng, Yizhi Fang, Haiteng Ma*	*Electronic and Photoluminescence Spectra of g-C3N4/Y2O3: A Shock Tube-Based Investigation (332)* *Sivaprakash Paramasivam, S.A. Martin Britto Dhas, Ikhyun Kim*	*An Investigation on the Origin of Heat Streaks on a Swept Wedge-Cone Geometry in Hypersonic Flow (286)* *Jacob Vaughn, Ivett Leyva, Koen Groot, Bryan Morreale, Jacob Smotzer*	*Design and testing of a Flush Air Data Sensing System for Sounding Rockets (102)* *(S) Sanjeev Adhikari, David Buttsworth, Fabian Zander, Ingo Jahn, Ingo Jahn, Fabian Zander*	*equilibrium-c: A Modern, Lightweight Equilibrium Chemistry Solver for Hypersonic Flow Applications (299)* *Nicholas Gibbons, Vincent Wheatley*	*Effect of Shock Leakage on Screech Mode Transition of Supersonic Jet Flows (87)* *(S) Jiacheng Liu, Shucheng Pan*
11:00 - 11:30	**Coffee Break** (Building 49, AEB)						

Mon 7 July 11:30-12:50							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Atmospheric Entry	**Diagnostics and Flow Visualization**	**Multiphase Flows**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Chemical Kinetics**	**Shock Wave Reflection, Interaction, and Focussing**
	Chair: Upendra Bhandarkar	Chair: Tamara Sopek	Chair: Josette Bellan	Chair: Arnab Roy	Chair: Ulrich Teubner	Chair: Justin Urso	Chair: Eran Arad
11:30	Flow visualization experiments around flare-type membrane aeroshell using ISAS expansion tube (202) *(S) Tomohito Morimoto, Jiro Kasahara, Yasunori Nagata, Kazuhiko Yamada*	Improvement of Dye-Painted Anodized-Aluminum Pressure-Sensitive Paint for Shock-Induced Unsteady Flow Measurement (427) *(S) Yuma Kawamata, Takeru Kawashima, Kiharu Yoneyama, Daiju Numata*	Numerical Simulation of the Aerobreakup of Two Droplet Positioned in Tandem under High Speed Flow (65) *(S) Yanming Li, Wangxia Wu, Honghui Teng*	The Effects of Mass Injection through Porous Media upstream of a Crossing Shock/Boundary-layer Interaction (78) *(S) Anthony Finnerty, Matthew McGilvray, David Mee, Raghul Ravichandran, Wesley Condren, Srinath Lakshman*	Study on the Ablation of UHTC and Graphite in Arc-Jet Environments via Flow-Material Response Coupled Analysis (86) *(S) Seonghwan Kim, Kyu Hong Kim, Yosheph Yang, Hojun You, Jaegang Kim*	Contact-Surface Tailoring Using N2/H2 and CO2/H2 Driver Mixtures in Diverging Shock Tubes (37) *(S) Matthew Sandberg, Eric Petersen*	Shock Wave Propagation with Fore-Flow in Converging Ducts (208) *(S) Naotaka Shigeta, Nao Kimura, Jun Hagiwara, Daniel Custodio, Takumi Asahi, Koki Ozawa, Yusuke Nakamura, Akihiro Sasoh, Gaku Fukushima*
11:50	Preliminary analysis of radiation measurements for high-speed Mars and Venus entry (266) *Yu Liu, Alexis Lefevre, David Gildfind, Kyle Damm, Chris James, Richard Morgan*	CN Laser Absorption Measurements at Extreme Conditions in a Free-Piston Shock Tube (436) *William Swain, Elijah Jans, Charley Downing, Kyle Lynch, Kyle Daniel, Justin Wagner*	Spread Rates of Bi-disperse Particle Curtains (438) *Kyle Daniel, Justin Wagner*	Wall Temperature Effect on Shock Wave/Turbulent Boundary Layer Interaction by Cryogenic Wall Cooling (164) *(S) Yuma Miki, Leo Ando, Azumi Miyazaki, Aoi Ban, Kiyoshi Kinefuchi, Yasuhiro Egami*	Tagging Velocimetry in Hypersonic Boundary Layers (200) *Ben Segall, Tim Keenoy, Nick Parziale*	NO Formation from Hydrogen Enriched Natural Gas Combustion in a Shock Tube using Cavity Enhanced Absorption Spectroscopy (106) *Ramees Rahman, Subith Vasu, Gregory Vogel*	Investigation of flow control-based heating reduction schemes for a V-shaped blunt leading edge (6) *(S) Tao Zhang, Chongguang Shi, Chengxiang Zhu, Yancheng You*
12:10	Convective Heat Transfer On A Reentry Body In Martian Atmosphere At Varying Enthalpies (315) *(S) Jithin Sreekumar, Honhar Gupta, Md Gulam Sarwar, Soumya Ranjan Nanda, Ashoke De, Mohammed Ibrahim Sugarno*	Drag Coefficient Measurement of a Sphere at Different Deceleration Rates (441) *Takamasa Kikuchi, Atsuki Yamauchi, Ren Sasaki, Mahiro Kudo, Kiyonobu Ohtani*	Particle Separation Using Expansion Waves (197) *Martin Brouillette, AurLie Grebe, Gaku Fukushima, David Chartrand, Mohamed Eldakamawy*	Effect of Freestream and Boundary-Layer Turbulence on SWBLI-Induced Unsteadiness in Mach 6 Flow (157) *(S) Emma Nicotra, Sally Bane, Joseph Jewell*	Subscale Suction Tests of an Airframe-integrated Busemann Intake for an Airbreathing Rocket (174) *Yuma Miki, Tasuku Miyazaki, Kiyoshi Kinefuchi, Yusuke Maru, Hiroaki Kobayashi, Shinichiro Tokudome, Tetsuya Sato*	Molecular Level Understanding of Nonequilibrium Air Chemistry in Hypersonic Flows (293) *Tom Schwartzentruber, Erik Torres*	Focusing of Shocks Generated by Underwater Copper Foil Explosions of Different Geometries (24) *Sebastián Rojas Mata, Francesc Hernández Garcia, Michael Liverts*
12:30	Measurement of Carbon Monoxide during TPS Ablation in a Hypersonic Shock Tunnel using Tunable Diode Laser Absorption Spectroscopy (433) *John Murray, Joshua Hargis, Christopher Murzyn, William Swain, Charley Downing, Kyle Lynch, Justin Wagner*	Shock Tube VUV Measurements of High Temperature Air Chemistry in Nitrogen-Oxygen-Argon Mixtures (256) *(S) Zev Granowitz, Devin Merrell, Jesse Streicher, Christopher Strand, Ronald Hanson*	Experimental Investigation of Liquid Aluminum Droplet Breakup in a Shock Tube (254) *(S) Leopold Winter, Marcus Giglmaier, Nikolaus A. Adams*	Shock Reflections with Dynamic Seperation Bubble (44) *Jianhui Fan*	Hypersonic boundary-layer transition control using acoustic metasurface (53) *(S) Yifeng Chen, Peixu Guo, Chihyung Wen*	Nonequilibrium chemistry model validation in a high-enthalpy test facility (248) *Tom Schwartzentruber, Erik Torres, Thomas Gross*	Thermochemical Non-Equilibrium Effects on Edney Type IV Shock Interactions in High-Enthalpy Hypersonic Flows (221) *Anu Priya, Ravi Peetala*
12:50 - 13:50	**Lunch** (Building 49, AEB)				**Shock Waves Institute (SWI) Lunch** (Room: 49-316A)		

Mon 7 July 13:50 - 14:50							
13:50 - 14:50	Room: 49-200; Chair: Prof Akihiro Sasoh **Plenary 2: Assoc Prof Sally Bane, Advancements in Active Control of Shock Wave/Boundary Layer Interaction**						
14:50 - 15:20	**Coffee Break** (Building 49, AEB)						
Mon 7 July 15:20-16:20							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Nozzle Flows and Supersonic Jets	**Facilities and Instrumentation**	**Shock Waves in Internal Flows**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Chemical Kinetics**	**Numerical Methods**
	Chair: Ben Guan	Chair: Sangdi Gu	Chair: Sannu Molder	Chair: Guilai Han	Chair: Dale Pullin	Chair: Christopher Strand	Chair: Santanu Ghosh
15:20	Characterization of a Single-Pulse, Highly Underexpanded Jet in the Endwall Region of a Shock Tube (415) *(S) Tristan Crumley, Matthew Abulail, Eric Petersen*	Design and Construction of a Large-diameter, Single-pulse Converging Shock Tube (89) *(S) Shijie Bai, Tianyou Wang, Xingyu Liang, Kun Wang*	DNS and LES of shock train in internal flows (13) *Somnath Ghosh, Agneev Roy*	Validity of Johnstons triangular crossflow model in conical shock wave boundary layer interactions (323) *(S) Bikalpa Bomjan Gurung, Sudhir Laxman Gai , Krishna Talluru*	Computational investigation of shear layer stability for different boundary layer thickness and cavity geometries in a laminar supersonic flow (339) *(S) Mohammed Areeb Hussain, Karthick Sk*	Laboratory Investigation of shock-induced dissociation of dust analogues - Buckminsterfullerene C60 and Coronene C24H12: Insights from real-time optical emission diagnostics. (42) *Deepak Singh*	A r-adaptive Discontinuous Galerkin Method Based on Interface Conservation for Computing Shock Waves on Arbitrary Grids (325) *Hong Luo, Gianni Absillis, Robert Nourgaliev, Patrick Greene*
15:40	Thrust Performance of ED Nozzle Induced by Internal Shock (284) *(S) Kyunghwan Han, Hyoung Jin Lee*	Near-Full-Scale CFD Simulation of HEK-X Flowfield (343) *Takeharu Sakai, Hiroshi Katsurayama, Hideyuki Tanno*	Large Eddy Simulations of Isolator Shock Trains in Supersonic Co-flow Configuration (153) *Pavithirah Selvam, Balaji Himakar Apparascheruvu, Srisha Rao*	Forced Axisymmetric Transitional SBLI at Mach 5 (440) *Ashish Singh, James Threadgill, Jesse Little*	Experimental analysis of acoustic noise receptivity using a ray-tracing technique for high-enthalpy conditions (312) *(S) James Wallington, Ramprakash Ananthapadmanaban, Chris James, David Gildfind, Anand Veeraragavan, David Mee*	State-to-State Chemical-Kinetic Database Construction and Master Equation Study for Hydrogen Chemistry (96) *(S) Hyesu Jeong, Sung Min Jo, Sung Min Jo*	Dynamic Load Balancing for Parallel Simulations of Unsteady Oblique Shock Wave Reflections Using Adaptive Mesh Refinement (113) *Yoshitaka Sakamura, Hiroki Mori, Katsuyuki Nakayama*
16:00	Interaction of the Recirculation Flow and Vortex Development in Extremely Under-expanded Supersonic Impinging Jet (240) *(S) Qingmo Xie, Huakun Huang, Peng Yu*	Design and Performance Analysis of a Super/Hypersonic Shock Tunnel by Two-Dimensional, Transient Computational Fluid Dynamics (108) *(S) Siming Dai, Yizhi Fang, Haiteng Ma*	Unsteadiness mitigation in a transonic cavity flow with a deep sub-cavity (171) *(S) Cherishma Mallavarapu, Hideaki Ogawa, Karthick Sk*	Interaction between cavity and wake flows in the transonic regime (250) *(S) Harshit Bansal, Pradeep Moise, Karthick Sk, Sriram Rengarajan, Sriram Rengarajan*	Effects of calculated experimental freestream conditions on double cone numerical predictions (28) *(S) Aaron Kennedy, Rowan Gollan, Matthew McGilvray*	Stochastic Chemical-kinetics Modeling of High-temperature Nitrogen (94) *(S) Tae Woong Jeong, Sung Min Jo, Sung Min Jo*	Bound- and positivity-preserving first-order velocity-consistent HLL scheme for two-medium γ -based model of stiffened gas (124) *Wai Sun Don, Bao-Shan Wang, Yuan-Yang Qiao, Chang-Ming Guo*
16:20 - 17:20	**Optional Laboratory Tours**						

Tuesday 8 July							
8:30 - 9:40	Room: 50-T203; Chair: Prof Joanna Austin **Plenary 3: Prof Hideyuki Tanno, Insights and Applications from high-enthalpy Shock Tunnel Studies**						
Tue 8 July 09:40 - 11:00							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Atmospheric Entry	**Diagnostics and Flow Visualization**	**Shock Waves in Internal Flows**	**Shock/Boundary Layer Interaction**	**Nozzle Flows and Supersonic Jets**	**Chemically Reactive Flows**	**Blast Waves**
	Chair: Savio Poovathingal	Chair: Bryan Schmidt	Chair: Haiteng Ma	Chair: Zhufei Li	Chair: Andrea Sansica	Chair: Yu Liu	Chair: Marianne G. Omang
9:40	Spectroscopic Measurements of Shock Layer around the Capsule Model with Hollow Fiber Probe (350) *Satoshi Nomura, Hiroki Takayanagi, Takumi Futohashi*	Non-Equilibrium Nitric Oxide Thermometry, Partial Pressure, and Velocity Measurements at 100 kHz in a Hypersonic Shock Tunnel (443) *Jonathan Gilvey, Elijah Jans, Bradley Lyon, Charley Downing, Kyle Lynch, Justin Wagner, Christopher Goldenstein*	Large-eddy simulation of shock-train dynamics in a cavity-stabilised ramjet engine (38) *(S) Tin-Hang Un, Salvador Navarro-Martinez*	Investigation of Roughness Elements on Oblique Shock Wave Boundary Layer Interaction (392) *(S) Akash Marade*	Numerical Study of Supersonic Exhaust Jet Flow Patterns (305) (S) Juan Sebastian Serrato Ortiz, Sylvester Abanteriba, Yan Ding, Ralf Stark, Justin Hardi, Jan Schyndel, Thomas Esch	Shock and blast pyrolysis of methane: a mini review (54) *Frank Lu, Ananthkumar Jayamani*	An apparatus for generating reproducible and scalable shock waves in the free field (61) *(S) Marco Gerbeit, Henrik Seeber, Dennis Grasse, Marcel Donner, Daniel Krentel*
10:00	Direct Simulation Monte Carlo study of Hypersonic Flow During Atmospheric Entry into Jovian Planets (356) *Devendra Koushal, Tapan Mankodi, Upendra Bhandarkar*	Development of CO Thermometry for Temperature Measurements over 3000-6000 K (57) *(S) Tielou Liu, Dong He, Renjie Li, Fei Li, Juchun Ding, Ting Si, Xisheng Luo*	Mechanism of Shock Transition from RR to MR with Single and Tandem Liquid Injection in a Supersonic Crossflow (184) *(S) Srinivas M V V, Arun Kumar Rajagopal*	Plasma Actuation for Control of Hypersonic Wind Tunnel Models (170) *Nathan Stern*	Effects of Permeable Section Parameters on Shock Separation and Thrust Performance of Permeable Rocket Nozzles (403) (S) Yuqin Xue, Yuqin Jin, Suoxuan Zhang, Ben Guan, Ge Wang, Yubing Bai	Development and Applications of an A Posteriori Two-Dimensional Solver for Shock Tube Experiments (185) *(S) Justin Clarke, Luca Di Mare, Matthew McGilvray*	Blast Waves Produced by Colliding Spheres (198) *Hannah Whelan, Brendan Wallace, Harald Kleine*
10:20	Instrumentation of 3D-printed Ablating aeroshells in a Hypersonic Impulse Facility (263) *(S) Steven Apirana, Nils Temme, Chris James, Richard Gareth Morgan*	Measurement of water vapor absorption spectroscopy parameters in high-temperature gases (103) *Jianyu Chao, Yi Jin, Dong He, Chao Zhai, Tielou Liu*	On the unsteadiness of reattachment shock in flow over cavity-ramp configuration (150) *(S) Waner Hu, Zhu Chengxiang, Jianhui Fan*	Normal Shock - Cavity Shear Layer Interactions in Internal Supersonic Flows (360) *(S) Siva Vayala, Harshit Bansal, Nagabhushana Rao Vadlamani, Sriram Rengarajan*	Effects of Nozzle Roughness on the Streamwise Streaks in Underexpanded Jets An Experimental Study (292) (S) Haohan Gong, Shengkai Wang	On The Reacting Flow Field of A Supersonic Combustor Fueled By Liquid N-Decane (219) *Wing Ki Cheung, Kuo-Long Pan*	Fundamental experiment on overpressure profile near gun muzzle (449) *Toshiharu Mizukaki, Daichi Kubo, Keisuke Kiura, Shinta Nakamura*
10:40	Combining Expansion Tubes and Laser Heating for Reentry Ablation Studies (148) *Kohei Shimamura*	Development of an Unsteady PSP Applicable to Low Reynolds Number and High Mach Number Flows for the Advancement of Supersonic Mars Aircraft (331) *(S) Tomoyuki Takizawa, Daiju Numata*	Isolator Shock Dynamics in a Streamtraced Busemann Intake during Back-Pressurization (247) *(S) Mark Noftz, Joseph Jewell*	Numerical Study on Mitigating Swept Shock-Induced Separation Using Air Jet Vortex Generators (328) *(S) Eunchae Kim, Soo Hyung Park*		The Use of CO Rovibrational Thermometry to Demonstrate the Vibrational Relaxation Behaviors of Shock-heated Air (56) *Dong He, Qizhen Hong, Tielou Liu, Renjie Li, Fei Li, Quanhua Sun, Ting Si, Xisheng Luo*	Evaluating Incident Peak Overpressure Estimates from Body-Mounted Blast Sensors and High-Fidelity Simulations (413) *Suthee Wiri, Christina Wagner, Jasmyne Longwell, Andrea Gonzales, David Ortley, Charles Needham*
11:00 - 11:30	**Coffee Break** (Building 49, AEB)						

Tue 8 July 11:30 - 12:50							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Atmospheric Entry	**Facilities and Instrumentation**	**Multiphase Flows**	**Richtmyer-Meshkov Instability**	**Supersonic and Hypersonic Flows**	**Detonation, Combustion and Ignition**	**Numerical Methods**
	Chair: Hiroki Nagai	Chair: David Mee	Chair: Hong Luo	Chair: Georges Jourdan	Chair: Rajesh Ranjan	Chair: Toshiharu Mizukaki	Chair: Rowan Gollan
11:30	Re-Entry Capsule Shock Layer Reconstruction from a Remote Observation (282) *Fabian Zander, Rowan Gollan*	A Ring-Amplified Shock Tube for Spectroscopy and Kinetics Research (417) *Christopher Strand, Devin Merrell, Ronald Hanson*	Barrel Shock Interaction in Tandem injection of supercritical Jet-A (394) *Eshaan Raj, Gagana Satyanarayan, Tm Muruganandam*	Richtmyer-Meshkov instability at gas/viscoelastic material interface (210) *(S) Yongrui Deng, Juchun Ding, Xisheng Luo*	High-Temperature Flow-Material Ablation Studies Using RBF Mesh Deformation (84) *Yosheph Yang, Seonghwan Kim, Gayeon Noh, Hojun You, Jaegang Kim*	Laminar Flame Speed Measurement of Supercritically Cracked Rocket Propellant-1 in a Shock Tube Under Scramjet Combustor Relevant Operating Conditions (329) *Chaitanya Bhoir, Jagadeesh Gopalan*	The influence of heat flux for compressible jet impingement heat transfer based on a developed turbulence model (398) *Huakun Huang, Qingmo Xie, Peng Yu*
11:50	Ultra High-Speed Emission Spectroscopy in the X2 Expansion Tube (259) *(S) Nathan Lu, Carolyn Jacobs, Timothy Mcintyre, Chris James*	Statistical Determination of Quasi-Steady Test Time in Shock and Expansion Tube Flows (235) *(S) Matthew Uren, Yu Liu, Chris James, Richard Gareth Morgan*	Evolution of Wall-attached Droplets under Shock Wave Impact (321) *(S) Peng Kang, Jianfeng Guo, Kai Mu, Ting Si*	Attenuation of the single-mode perturbation growth for the shocked multi-interfaces system via double waves impacts (129) *(S) Chenren Chen, Zhigang Zhai, Xisheng Luo*	Effect of Reynolds number on unsteady instabilities in hypersonic cone-step flow (447) *Gs Sidharth, Anubhav Dwivedi, Chase Jenquin, Eric Cui, Joseph Jewell*	Investigation of V-shaped initiation scheme of standing detonation engine (178) *(S) Haochen Xiong, Tao Zhang, Chongguang Shi, Yancheng You*	Spectral Fitting with Rigorous Conservation Constraints (409) *Albert Williams, Alex Glenn, Justin Clarke, Luca Di Mare, Matthew McGilvray*
12:10	Experimental and Numerical Study of CO2 radiation in high temperature flows (338) *(S) Yixin Xu, Senhao Zhang, Fei Li, Jinping Li, Shizhong Zhang, Xiaoyuan Zhang, Xin Lin*	Characterising the Step Response of a Static Pressure Probe (159) *(S) William Feasey, Joanna Austin, Hans Hornung*	Particle-Resolved Numerical Simulation of a Particle Lift-Off from a Rough Surface (122) *Pavel Utkin, Alexander Lopato*	Reactive Richtmyer-Meshkov Instability at Hydrogen-Air Interface (228) *(S) Jianwen Liu, Juchun Ding, Wan Cheng, Pengfei Yang, Xisheng Luo*	Experimental Investigation on Unstart and Restart phenomena in Scramjet Inlet (437) *Sanghoon Lee, Yang-Ji Lee, Inyoung Yang, Kyungjae Lee*	Wall Temperature Dependence of Flame Structure in an Axisymmetric Scramjet Combustor (389) *(S) Rahul Jain, Michael Jain, Venkat Raman*	Boundary Condition-based Machine Learning Algorithm for Fast Prediction of Chemically Reactive Hypersonic Flows in Rarefied Atmosphere (186) *(S) Rachakonda Naga Sai Prakash, Sumati Raghav, Tapan Mankodi, Niranjan Sahoo*
12:30	Axisymmetric Viscous Nitrogen Shock Layer Computed with a Vibrational-State Specific Kinetics Model (47) *Marie-Claude Druguet, Arnaud Bultel*	Feasibility of ITO Thin Film Gauges for Impulse Facilities (405) *Frank Lu, Emirhan Bayir, Ananthkumar Jayamani*	High Mach Number Aerobreakup (191) *Jett Langhorn, Alex Dworzanczyk, Nick Parziale*	Richtmyer-Meshkov Instability at Quasi-Single-Mode Interfaces Accelerated by a Strong Shock Wave (68) *(S) Wei Cai, Shuaishuai Jiang, Ting Si, Xisheng Luo, He Wang*	Induced Transition Strategy over a 2D Wedge at Hypersonic Speed (301) *Talluri Vamsi Krishna, Jacob Cohen, Soumya Nanda*	Effect of Multiple Detonations on the Detonation Parameters in Rotating Detonation Engine (101) *(S) Sunil Bassi, Venkata Ramana Ikkurthi*	
12:50 - 13:50	**Lunch** (Building 49, AEB)						

13:50-14:50	Room: 49-200; Chair: Prof Christian Mundt **Plenary 4: Prof Matthew McGilvray, Development, Experiments and A-posteriori Modelling of Shock Tubes**						
14:50 - 15:20	**Coffee Break** (Building 49, AEB)						
Tue 8 July 15:20 - 16:20							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Nozzle Flows and Supersonic Jets	**Facilities and Instrumentation**	**Medical and Biological Applications**	**Richtmyer-Meshkov Instability**	**Supersonic and Hypersonic Flows**	**Chemical Kinetics**	**Plasmadynamics and Magnetohydrodynamics**
	Chair: Somnath Ghosh	Chair: Krishna Talluru	Chair: Gopalan Jagadeesh	Chair: He Wang	Chair: Moritz Ertl	Chair: Tom Schwartzentruber	Chair: Kyle Hanquist
15:20	Mid-infrared Laser Absorption Spectroscopy of CO2 for Thermochemical Nonequilibrium Study in Expanding Flow (233) *(S) Zhang Yitong, Huang Yingjing, Qiu Wang*	Heat Transfer Measurements for Heated Canonical Geometries in Hypersonic Shock Tunnel (381) *Chathura Guddemane Ramesh, Vyom Sharma, Nagashetty K, Saravanan S, Srisha Rao*	Shock Wave Impact Effects on Surface Morphology of an Arecanut Leaf Sheath (372) *(S) Numan Ahamed N, Niyati Shanbhag, Nihad Ahmed, Sudarshan B, Anil Chandra A R, N R Prabhu Swamy*	Vortex Interactions and Mixing of A Shocked Fluid Layer (167) *(S) Dugang Zheng, Xu Guo, Zhigang Zhai, Xisheng Luo*	Computations of Turbulent Transition Control with Porous Surface in Hypersonic Boundary Layer (255) *(S) Minjae Jeong, Suhun Cho, Youngwoo Kim, Solkeun Jee*	Development of a Multi-Wavelength Laser Absorption Schema for Speciation Measurements of Ammonia and NOx Reaction Kinetics at Turbine Relevant Conditions (145) *Christopher Dennis, Justin Urso, Ramees Rahman, Nikolas Hulliger, Subith Vasu, Michael Pierro*	Electron Plasma Waves / Collision-less Shock Waves Generation by Electron Beam Emission in Ionosphere Plasma (435) *Koichi Mori, Kosuke Ohrui*
15:40	Computational investigation on the impact of the secondary injection angle on the thrust vectoring performance in a supersonic nozzle (112) *(S) Sagar Sedani, Karthick Sk, Shria Anand, Sibaram Patro, Purushothaman Nandagopalan, Sriram Rangarajan*	A quasi-one-dimensional simulation strategy for ultrahigh shock speed in the detonation-driven shock tube (236) *(S) Wentao Wang, Kai Luo, Qiu Wang, Zhuo Liu*	Study on Confined Cavitation Jet Behavior with Underwater Shock Waves for Removal of Marine Sessile Organisms (88) *Jinichi Koue, Akihisa Abe, Haruo Mimura*	Analytical and numerical investigations on non-standard Richtmyer-Meshkov instability attenuation at a heavy-light interface (127) *(S) Jiaxuan Li, Zhigang Zhai, Chih-Yung Wen Wen, Xisheng Luo*	Experimental heat loads of hypersonic diffuser and heat exchanger in GHIBLI Plasma Wind Tunnel (180) *Eduardo Trifoni, Carlo Purpura*	Comparative and Uncertainty Analyses of Radiation Solvers: MURP and NEQAIR (385) *Sung Min Jo, Marco Panesi*	Visualization and CFD Validation of MHD Aerobraking Shock Layer Enlargement in JAXA HEK-X Expansion Tube (374) *Hiroshi Katsurayama, Yuma Higashi, Takeharu Sakai, Hiroki Sakamoto, Kohei Shimamura, Hideyuki Tanno, Shuto Yatsuyanagi*
16:00	Shock wave phenomena in expansion-deflection nozzles (227) *(S) Shuhui Zhao, Ben Guan, Ge Wang, Bocheng Zhou, Xisheng Luo*	Computational flow modelling of the X3/R free-piston driven facility in expansion tube (X) mode (139) *Tamara Sopek, Peter Jacobs, Richard Gareth Morgan*	Observation of propagation of femto-second laser induced micro shock wave and bubble behavior to develop devices for regenerative medicine (306) *Haruto Yamakita, Ayumu Yamamoto, Kota Nakashima, Masaaki Tamagawa*	Richtmyer-Meshkov Instability Coupled with a Chemical Reaction (48) *Tanner Diring, Eri Amezcua, Jason Oakley, David Rothamer, Riccardo Bonazza*	Numerical Simulation of the Experimental Results of Chemically Reaching Wakes of Hypersonic Spheres (20) *Robert Macdermott*	Ab-initio based collision model for DSMC using multiple O3 Potential Energy Surfaces (99) *(S) Ashirbad Mallick, Tapan Mankodi*	Numerical Simulation of Fully Coupled Magnetohydrodynamics with Thermochemical Nonequilibrium model in Hypersonic Regime (49) *(S) Chanho Kim, Kyu Hong Kim, Jaegang Kim, Hojun You*
16:20 - 18:00	Room: 49-301 **Poster Session with Drinks** (See page 30 onward for poster session details)						
18:00-21:00	**Dinner for IAC and Plenary Speakers** (at Patina Restaurant, see map on page 9 for directions)						

Wednesday 9 July	
8:00- 17:00	**Tangalooma Social Day on Moreton Island** (See page 34 for bus pick-up locations and other details)

Thursday 10 July

8:30 - 9:40	Room: 50-T203; Chair: Prof Ron Hanson **Plenary 5: Prof Sean O'Byrne, Nonintrusive Diagnostics for High-Speed Flight Tests**						
Thu 10 July 09:40 - 11:00							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Atmospheric Entry	**Diagnostics and Flow Visualization**	**Multiphase Flows**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Detonation, Combustion and Ignition**	**Numerical Methods**
	Chair: Eduardo Trifoni	Chair: Tristan Vanyai	Chair: Juan Sebastian Rubio	Chair: Srisha Rao M V	Chair: Peixu Guo	Chair: Shrey Trivedi	Chair: Nicholas Gibbons
9:40	Validation of CO2 Chemical Kinetics in Expanding and Recombining High Density Mars Entry Conditions (445) *(S) Mragank Singh, Chris James, Tim Mcintyre, Richard Gareth Morgan*	Quantitative visualization of flow field behind weak shock waves with parallel phase-shift interferometry (238) *(S) Yuki Iwamoto, Kiyonobu Ohtani, Toshiharu Mizukaki*	Development of a High-Fidelity Eulerian-Lagrangian Framework for High-enthalpy Particle-Laden Plasmas (95) *(S) Hyeonwoo Nam, Sung Min Jo*	Hypersonic Transitional Experiments on a 10.9 deg Cone by Using ALTP Sensors for Direct Heat-Flux and Temperature Measurements (183) *(S) Claudia Hofmann, Simon Kaneider, Tim Rodiger, Jan-Erik Brune, Christian Mundt , Lukas Jakobs*	Suppression of acoustic wave using passive device in supersonic cavity with sub-cavity. (313) *Mitali Joshi, Cherishma Mallavarapu, Karthick S. K., Hideaki Ogawa, Bamelari Dkhar*	Numerical Simulation of Shock Transmission from the Exit of a Detonation Tube (121) *(S) Milin Martin, Ebuzer Tarik Balci, Elaine Oran*	A machine learning-augmented CFD framework for achieving DSMC-level accuracy in shock flow analysis of diatomic gases (149) *Gagan Garg, Tapan Mankodi, Rho Shin Myong*
10:00	Force and Moment Coefficients of a Cube Interacting with a Ramp Shock at Mach 7 (276) *(S) Gerard Armstrong, David Buttsworth, Fabian Zander*	Development of Fast-response Temperature Sensitive Paint and Its Application to Shock Tube (110) *(S) Jinyoung Kim, Mithat Engin, Masaki Okawa, Bok Jik Lee, Tsubasa Ikami, Hiroki Nagai*	Investigating Pseudosteady Reflections in Dusty Flows using Meshless Framework (336) *(S) Avinash Singh, T. Jayachandran, Rajesh G., Shubham Kailas Vyas*	Numerical Analysis of the Reflected Shock Region in a Single-Diaphragm Shock Tube Modeled with Realistic Diaphragm Opening Profiles (353) *(S) Touqeer Anwar Kashif, Janardhanraj Subburaj, Aamir Farooq*	Film Cooling-Induced Transition in High-Speed Laminar Boundary Layers: Transition Modeling and Analysis (212) *Diviaharshavardini R C, Davoud Hosseinzadeh, Jayachandran T, Rajesh G, Ikhyun Kim*	Why the standard devices for extinguishing detonation in pipelines can work (155) *Zbigniew Walenta, Agnieszka Slowicka*	A Hybrid Genetic AlgorithmPareto Framework for Optimizing Film Cooling in Hypersonic Flows (209) *(S) Davoud Hosseinzadeh, Diviaharshavardini R C, Ikhyun Kim*
10:20	Transpiration Cooling Using 3D-Printed Porous Silicon Carbide (189) *(S) William Matthews, Ivett Leyva, Hassan Saad Ifti, Garrett Yoder, Sean Ryan, John Howard*	Development of an Integrated Schlieren-FLDI System for Characterizing High-Speed Flows in the T4 Stalker Tube (289) *(S) Maxwell Young, Ramprakash Ananthapadmanaban, Anand Veeraragavan, Matthew Trudgian*	Effect of Sub-models in a High-Fidelity Hyperbolic System of Equations on Predicting Characteristics of Craters Formed on a Granular Soil by a Supersonic Impinging Jet (10) *Josette Bellan*	Resolvent analysis of hypersonic compression corner flow under crossflow effect (12) *Chun Kit Uy, Chih-Yung Wen Wen, Jiaao Hao, Jiaao Hao*	Experimental Study on Boundary Layer Transition Delay Using Porous Surfaces in a Hypersonic Flow (168) *(S) Junhyuk Nam, Jungmu Hur, Jinhwi Kim, Jinyoung Kim, Bok Jik Lee*	Computations on Supersonic Combustion for an Orifice Hydrogen Injection into Airstream of Mach 8 and 10 (448) *Zhuhe Zhang, Shengli Xu*	Low Cost, A-posteriori Expansion Tunnel Freestream Modelling with Non-Equilibrium (158) *Joseph Steer, Luca Di Mare, Matthew McGilvray*
10:40		Spectral analysis of simultaneous schlieren and shadowgraph measurements (173) *Krishna Talluru, Harald Kleine*	Wave Dynamics in Densely Packed Particles Subjected to Periodic Shock Wave Impact (156) *Pavel Utkin*	Experimental Investigation of Shock - Cavity Shear Layer Interaction in a Confined Supersonic Flow over a Tapered Cavity with Gas Injection (245) *(S) Dwarakesh Madavan, Purna Ananthkrishnan, Pandian Samiayyan, Sriram Rengarajan, Malsur Dharavath*	Using Thermal Compression to Combust Simple Hydrocarbon Fuels in Scramjets (307) *(S) Vinay Dekkala, Vincent Wheatley, Nicholas Gibbons, Tristan Vanyai*	Universal Framework for Gaseous Detonation Propagation and Initiation (109) *Zonglin Jiang*	Characterization of Turbulent Transonic Buffet Using an Improved Hybrid Monotonic Upstream-Centered Scheme (162) *Andrea Sansica, David Lusher, Keiichi Kitamura, Gaku Fukushima, Hashimoto Atsushi*
11:00 - 11:30	**Coffee Break** (Building 49, AEB)						

Thu 10 July 11:30 - 12:50

	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Atmospheric Entry	**Facilities and Instrumentation**	**Shock Waves in Dense/Rarefied Gases**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Detonation, Combustion and Ignition**	**Shock Wave Reflection, Interaction, and Focussing**
	Chair: Hassan Saad Ifti	Chair: Chris James	Chair: Rho Shin Myong	Chair: Sriram Rengarajan	Chair: Koen Groot	Chair: Edyta Dzieminska	Chair: Sivaprasad Gangadharan
11:30	Preliminary X2 Expansion Tube Experiments Investigating Radiation at Peak Velocity Uranus Entry Conditions (172) *(S) Daisy-May Joslyn, Samuel G. Lock, Matthew Uren, Toby J. van den Herik, Robert G. Watt, Nicholas N. Gibbons, Yu Liu, Richard G. Morgan and Christopher M. James*	Initial Shakedown Testing of the Stanford High-enthalpy Optical Tube/Tunnel (SHOTT) (82) *(S) Tal Schwartz, Alexis Thoeny, Konstantinos Kotsarinis, Jin Lee, Padmanabha Simha, Eric Zhao, Sarah Baird, Jason Lin, Christopher Strand, Ronald Hanson*	Rarefaction waves in the dense vapors of D6 (126) *Chandrasekhar Medipati, Chiara Falsetti, Piero Colonna*	Correlation for the prediction of separation length in impinging oblique-shock/turbulent-boundary-layer interactions (320) *Vinay B A, Santanu Ghosh, Muruganandam T M*	Aerodynamic heating characteristics of V-shaped edge at hypersonic speeds (396) *Guilai Han, Shicheng Zhan*	Effects of Initiation Configuration on Development and Propagation of Detonation Waves (93) *(S) Jayson Small, Liwei Zhang*	Rylov's Conjecture and a Singularity (5) *Sannu Molder, Amin Gulamhussein, Ben Shoesmith*
11:50	Laser Absorption Spectroscopy to Magnetohydrodynamic Aerobraking in an Expansion Tube (285) *(S) Takeaki Muramatsu, Kohei Shimamura, Akira Kakami, Hiroshi Katsurayama, David Gildfind*	Characterization of Modified Shock Tunnel (S1) (241) *(S) Jithin Sreekumar, Honhar Gupta, Soumya Ranjan Nanda, Md Gulam Sarwar, Mohammed Ibrahim Sugarno*	Shock Driven Mixing of Active Scalars (304) *(S) Joaquim P Jossy, Prateek Gupta*	Aerothermal Symmetry in Hypersonic Transitional Swept Shock-Wave/Boundary-Layer Interactions (114) *Xu Liu, Di Peng, Jiaao Hao*	Three-Dimensional Receptivity of Hypersonic Boundary Layers over Sharp Wings (29) *(S) Jiachen Lu, Chun Kit Uy, Rui Zhao, Chih-Yung Wen Wen*	Thermochemical Parameters Measurement in a High Mach Number Scramjet Engine Using Mid-Infrared Laser Absorption Spectroscopy (253) *(S) Renjie Li, Dong He, Xiaoyuan Zhang, Dongdong Meng, Xi Gong, Xin Lin, Fei Li*	Time-Resolved Parametric Study of Shock Wave Reflection from Wavy Walls (352) *Randall Paton, Irshaad Mahomed, James Kamerman*
12:10	Laser-based Absorption Measurements of Atomic Air Species Using a Ring-Amplified Shock Tube (39) *Devin Merrell, Dylan Drescher, Zev Granowitz, Jesse Streicher, Christopher Strand, Ronald Hanson*	One- and Two-Dimensional Models of the HYPULSE Shock Tunnel (269) *(S) Matthew Bush, Adrian Flores, Joseph Jewell*	Fokker-Planck Simulations of the SHEFEX~II Vehicle (130) *Moritz Ertl, Leo Basov, Marius Franze*	Study on the Concept of Free Interaction of Supersonic Flows over Compression Ramp (9) *(S) John Chemmanoor Joseph, Lijo V, Heuy Dong Kim, Heuy Dong Kim*	Development of Inviscid Supersonic Flow in the Wake of a Circular Cylinder (275) *(S) Akshay Kumar Nandhan, Krishna Talluru, Sudhir Laxman Gai*	Experimental Study of a Rotating Detonation Engine(RDE) with an applied Cooling Channel (273) *(S) Minsik Yun, Tae Seong Roh, Hyoung Jin Lee*	Experimental Study of Oblique-Shock/Bow-Shock Interaction with a Large-scale Test Model in Hypersonic Flows (163) *Zongmin Hu, Yao Zhang, Shaolai Li*
12:30	Role of Enthalpy on Hypervelocity Mach Stem Turbulence (411) *Rodney Bowersox*	Estimating Flow Conditions in a Stalker Tube for Conditions with Attenuating Primary Shock Waves (226) *David Mee*	Collision and Reflection of Micro Shock Waves (251) *Ulrich Teubner, Walter Garen, Lars Jepsen*	Transition Scenario in a Mach-6.5 Compression Ramp Flow (25) *Shibin Cao, Qiu Wang*	Intermittency in hypersonic transitional and turbulent boundary layers (262) *Krishna Talluru, David Petty, David Mee, Anand Veeraragavan*	Detonation initiation and propagation in stratified cracked ammonia (175) *Jie Sun, Yicun Wang, Huangwei Zhang*	Shock wave focusing of hemispherical shocks (73) *Marianne Omang, Knut Ove Hauge*
12:50 - 13:50	**Lunch** (Building 49, AEB)			**Shock Waves Journal (SWJ) Lunch** (Patina Café / Restaurant. Refer to map on page 9)			

Thursday 10 July							
13:50 - 14:50	Room: 49-200; Chair: Prof Joe Jewell **Plenary 6: Prof Ivett Leyva, Perspectives on Hypersonics from my Experiences at AFOSR and Academia**						
14:50 - 15:20	**Coffee Break** (Building 49, AEB)						
Thu 10 July 15:20 - 17:00							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	High Enthalpy Gas Dynamics	**Facilities and Instrumentation**	**Shock Waves in Liquids**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Detonation, Combustion and Ignition**	**Shock Wave Reflection, Interaction, and Focussing**
	Chair: Robert MacDermott	Chair: David Buttsworth	Chair: Kavitha Jayaram	Chair: Anand Veeraragavan	Chair: Dong He	Chair: Zbigniew Walenta	Chair: Randall Paton
15:20	Numerical simulation of a three-dimensional relativistic astrophysical jet issuing from an Active galactic nuclei (274) *Ribhu Pal, Arnab Roy*	Miniaturisation of an Antenna for the X2 Expansion Tunnels Microwave Interferometry System (214) *(S) Sandy Goetjens, Toby van den Herik, Chris James*	Scaling of Flow Phenomena in Hypervelocity Water Entry (281) *(S) Joshua Smith, Monal Patel, Manuel Viqueira-Moreira, Matthew Sendrey, Premika Thasu, Bryan Schmidt, Christoph Brehm*	Time-Scale Aerodynamic Performance of NS-SDBD Plasma Actuation and Its Control of Small-Height Backward Step Separation in Transonic Flow (120) *Feng Ye, Jianlei Wang, Enbo Ju, Xuanshi Meng*	Numerical study on the longitudinal stability of the parallel-staged two-stage-to-orbit vehicle during hypersonic transverse stage separation (154) *Yue Wang, Yunpeng Wang, Yiming Liu*	Experimental Investigation of Detonation Wave Propagation and Interactions with Different Media (272) *(S) Edyta Dzieminska, Sanjeev Kumar Mall*	Numerical Simulation of Shock-Focusing in a 3-Wall 90 deg Corner with Hydrogen-Air Mixture (397) *(S) Henrik Thomas, Irenaus Wlokas, Andreas Kempf, Wojciech Rudy*
15:40	Numerical Investigation of Shock Stand-off Distance in Chlorine (429) *(S) Robert Watt, Rowan Gollan*	L1d Simulation of a Hydrogen Preheater for Supersonic Combustion Studies (444) *Ramprakash Ananthapadmanaban, David Mee*	Experimental Investigation of Hypervelocity Water Entry by Spherical Projectiles (196) *(S) Matthew Sendrey, Bryan Schmidt, Josh Smith, Premika Thasu*	Hypersonic Shock Wave/Boundary Layer Interactions on a Heated, Compliant Clamped-Free-Clamped-Free Panel (268) *Damon Kirkpatrick, Andrew Neely, Dylan Dooner, Charlie Hoke, Timothy Beberniss, David Buttsworth*	Experimental Investigation on 25-50 deg Double-cone Flow at Mach 6 (117) *Xin Li, Zongnan Chen, Jiaao Hao, Jiaao Hao*	Numerical research on droplet deformation characteristics within the gaseous multi-dimensional detonation flow-field (63) *(S) Hanbing Zou, Yijue Wei, Sheng Xu, Bing Wang*	Shocks Interactions and Reflections During Startup Process of An Hypersonic Air-Breathing Vehicle (72) *Eran Arad, Omri Ram, Yoav Gichon*
16:00	Temperature measurements in cylindrical shock wave convergence (151) *(S) Sourabh Bhardwaj, Nicholas Apazidis, Michael Liverts*	Multi-Fidelity Theory and Simulation of High-Enthalpy Shock Tubes (279) *Aaron Larsen, Kyle Hanquist*	Shock Wave Dynamics in Underwater Copper Wire Explosions (377) *Michael Liverts, Francesc Hernández Garcia, Sebastián Rojas Mata*	Hypersonic Shock Wave-Boundary Layer Interaction Experiments on a Cone-Slice-Wedge over a Range of Enthalpies (434) *Justin Wagner, Elijah Jans, Kyle Daniel, William Swain, Kyle Lynch*	Conjugate Heat Transfer Simulation of High Enthalpy Reacting Flows over a Double Wedge at Mach 7 (364) *(S) Ladin Uluakan, Bayram Celik*	Experimental Investigation of a Reacting Bidisperse Particle Curtain Under Extreme Conditions (439) *Juan Rubio, Kyle Daniel, Justin Wagner*	Shock Interactions on Asymmetric V-shaped Blunt Leading Edges (357) *(S) Yu Chen, Zhufei Li*
16:20	Thermochemical Nonequilibrium Study on the JFX Nozzle Expanding Air Flows (51) *(S) Tia Chen, Sangdi Gu, Zhuo Liu, Chihyung Wen, Kai Luo, Fei Li, Qiu Wang, Renjie Li*	Development of Optical, Through-model, Temperature-based Surface Heat Flux Sensor for Hypervelocity Flows (207) *(S) Chengxin Yu, David Gildfind, David Mee, Tim Mcintyre*	Study on Underwater Wave Phenomena and Bubble Formation Induced by Impact Bending of Bar Materials in Contact with the Water Surface (71) *Akihisa Abe, Jinichi Koue, Takehiro Fujimoto*	Analysis of large-scale spanwise motions of turbulent separation bubbles (46) *(S) Zhen Zhang, Xin Li, Jiaao Hao, Jiaao Hao*	Numerical studies of high enthalpy flow in micro-scale shocktube (244) *Ribhu Pal, Debayan Das, Arnab Roy, Lars Jepsen, Walter Garen, Ulrich Teubner*	Molecular level analysis of induction zone length in hydrogen-air detonations with increasing Mach number using DSMC (43) *Shrey Trivedi, John K. Harvey, Jacqueline H. Chen*	Unsteady Reflections in a Concave Cavity and Convex Bump in the Weak Shock Domain (146) *Vedant Vijaykrishnan, Thara Reshma, Rajesh G. , S Vishnu Prasad, Vinoth P, Vinoth P*
16:40	Dissociation in the Stagnation Point Boundary Layer (223) *Sangdi Gu*	Implementation of Ionisation Probe Based Shock Speed Sensor in the X2 Expansion Tube (147) *Callagan Wing, Chris James, Daisy-May Joslyn*	Pseudosteady shock refractions over air-silicon oil and air-glycerin interfaces (330) *Somesh Putti, Md Asif, Anbu Serene Raj C, Mano M, Rajesh G*	Control of Swept Shock Wave / Boundary Layer Interactions using Air-Jet Vortex Generators (351) *Bhavesh Tongaria, Deepak Prema Ramaswamy, Sriram Rengarajan, Anne-Marie Schreyer*	On the transition reversal on a blunted plate at Mach 4 (199) *(S) Yuen Lee, Jiaao Hao*	Towards high-speed metal combustion (277) *Nicholas Kanizaj, Samuel Cousens, Donna Capararo*	Synchrotron Radiography of Wire-Driven Cylindrical and Semi-Cylindrical Shock Waves Interacting with a Bubble (128) *(S) Francesc Hernández Garcia, Nicholas Apazidis, Michael Liverts*

18:00-21:00	**Conference Banquet** (Page 36 for details and a map) (Sofitel Brisbane Central, Ballroom Le Grand, 249 Turbot St, Brisbane City – Above the Brisbane Central Train Station)

Friday 11 July

Fri 11 July 08:40 - 10:00

	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	Propulsion	**Facilities and Instrumentation**	**Shock Waves in Internal Flows /Multiphase Flows**	**Richtmyer-Meshkov Instability**	**Supersonic and Hypersonic Flows**	**Shock/Boundary Layer Interaction**	**Shock Wave Reflection, Interaction, and Focussing**
	Chair: Andrew Neely	Chair: Shengkai Wang	Chair: Rajesh Gopalapillai	Chair: Vincent Wheatley	Chair: Karthick Sengunthapuram Kandasamy	Chair: Ramprakash Ananthapadmanaban	Chair: Harald Kleine
8:40	Supersonic Combustor Test Facility Providing Clean Air and Its Spatial Flow Uniformity Measurement (426) *Inyoung Yang, Sang-Hun Lee, Bo-Yeon Kim, Kyung-Won Park, Hyun-Seung Lee*	Qualification of the NASA Ames Low Density Shock Tube (104) *Brett Cruden, Andrea Fagnani*	Investigating the Relationship Between Cavity Shape and Flow Characteristics for Transonic Flow. (359) *(S) Anagha Kuniyil, Karthick Sk, Niranjan Ghaisas, Gnanaprakash K, Rajesh Kumar, Jaysinh J. Patel*	Time-Resolved Particle Image Velocimetry Measurements of the Rarefaction-Driven Rayleigh-Taylor Instability (242) *Weston Meyers, Kevin Ferguson, Jeffrey Jacobs*	Base Pressure Establishment Time of Slender Sphere-Cones in Hypersonic Flow (105) *(S) Liam Mcquellin, Luke Doherty*	Simultaneous Fluid and Structure Measurements of an Impinging Shock-Boundary Layer Interaction in Mach 4 Flow (161) *(S) Alex Acosta, Ying Luo, Joanna Austin*	Investigating the Dynamics of Transmitted and Reflected Shock Waves in Converging Ducts with Varying Contraction Geometries (77) *(S) Yoav Gichon, Hemanth Chandravamsi, Omri Ram*
9:00	Performance Evaluation of Disk-Type Rotating Detonation Engine for a Model Rocket Launch (384) *(S) Shinji Mabuchi, Toshiharu Mizukaki, Rintaro Suzuki, Naoki Okamoto, Michael Kawalec, Edyta Dzieminska, Mizuki Toyoda*	The Detonation Research Test Facility Going Upscale (133) *Elaine Oran, Scott Jackson*	Experimental Verification and Analysis of 3D Shock-surface-based Curved Shock Theory (26) *(S) Mengfei Zhang, Chongguang Shi, Yancheng You*	Suppression of hydrodynamic instability at interfaces with various Atwood numbers via a same-side second shock impact (136) *(S) Yinuo Xing, Zhigang Zhai, Xisheng Luo, He Wang*	Experimental Investigation of Pressure Distribution on an Osculating Cone Waverider (118) *(S) P V Karthikeya Bharadwaj*	Effect of dynamic variation in shock strength on shock-induced Fluid-Structure Interaction (406) *(S) Rahul Kapse*	Shock-particle interaction in convergent geometry; first results (152) *(S) Georges Jourdan, Baptiste Theurier, Christian Mariani, Marc Vandenboomgaerde*
9:20	Forced Dual-Mode Combustion in an Accelerator Scramjet Flowpath (290) *Tristan Vanyai, Damian Curran, Vincent Wheatley*	Development of Multiphase Shock Tube Facility and Shock Processing of Natural Sand from Australian Desert (91) *Dr. Jayaram Vishakantaiah, Nagaraj Mariyappa, Kavitha Jayaram*	Effect of the Initial Diaphragm Opening Phase on the Shock Parameters Obtained in a Single-Diaphragm Shock Tube (349) *(S) Janardhanraj Subburaj, Touqueer Anwar Kashif, Aamir Farooq*	Effects of Mach Numbers on Reactive and Inert Shock-Induced Double-Layer Gas Cylinders (123) *(S) Xin Li, Chih-Yung Wen Wen, Jiaao Hao*	Exploring Control Strategy to Mitigate Unsteadiness in Hypersonic Cavity (297) *Md Gulam Sarwar, Soumya Ranjan Nanda, Mohammed Ibrahim Sugarno*	The effect of sweep angle on shock-induced cellular separation bubbles in wide-span 3D turbulent transonic aerofoil buffet (3) *David Lusher, Andrea Sansica*	A Study on Head-on-Head Collision of Expansion Waves (327) *Rajesh G, S Vishnu Prasad, Anbu Serene Raj C, Mano M, Vinoth P, Vinoth P*
9:40	Theoretical Analysis on the Performance of Ram-Rotor Detonation Engine (15) *Haocheng Wen, Bing Wang*	Experimental and Numerical Investigation of Shock Wave Formation and Propagation in a Miniature 20 mm Diaphragmless Shock Tube (346) *(S) Janardhanraj Subburaj, Touqueer Anwar Kashif, Serban Rotaru, Guido Dessy, Ahmed Habib, Mohanad Shamsan, Adolfo Sausa, Aamir Farooq*	Characterization of Twin Impinging Liquid Jet at Supersonic Air Crossflow (378) *Srinivasa Narasimman V B*	Shock-tube experiments on strong-shock-driven single-mode Richtmyer-Meshkov instability (141) *He Wang, Shuaishuai Jiang, Wei Cai, Ting Si, Xisheng Luo*	Investigation of shock-shock interaction in variable Mach number flow with symmetric and asymmetric shock generators (355) *Vijayakrishnan Venkatesan, Muruganandam T. M.*	Three-dimensional Shockwave Boundary Layer Interactions (179) *(S) Raja Janmejay, Srisha Rao, Jagadeesh Gopalan*	Characterization of Edney Shock-Shock Interactions in Supersonic Flow (386) *Eryl Shaji, Muruganandam Tm, Sebastian Ds, Madhura Sabhahit, Snega Manjini*

10:00 - 11:00	Room: 49-200; Chair: Prof Martin Brouilette **Plenary 7: Prof Oren Petel, Advances in Experimental Methodologies to Investigate Blast and Impact Trauma**						
11:00 - 11:30	**Coffee Break** (Building 49, AEB)						
11:30 - 12:30	Room: 49-200; Chair: Prof Frank Lu **Plenary 8: Prof Vincent Wheatley, Development of an Accelerator Scramjet for Access-to-space**						
12:30 - 13:50	**Lunch** (Building 49, AEB)						
Fri 11 July 13:50 - 14:50							
	Room: 50-N201	Room: 50-N202	Room: 50-T103	Room: 50-T105	Room: 50-S201	Room: 50-C207	Room: 49-313A
	High Enthalpy Gas Dynamics	**Diagnostics and Flow Visualization**	**Shock Wave Interaction with Various Media**	**Shock/Boundary Layer Interaction**	**Supersonic and Hypersonic Flows**	**Detonation, Combustion and Ignition**	**Plasmadynamics and Magnetohydrodynamics**
	Chair: Zonglin Jiang	Chair: Muruganandam Thiruchengode Mahalingam	Chair: Pavel Utkin	Chair: Kyle Daniel	Chair: James Threadgill	Chair: Elangannan Arunan	Chair: David Gildfind
13:50	Numerical Investigations of Nonequilibrium De-excitation Using a Collisional-Radiative Model in Nitrogen (50) *(S) Zhuo Liu, Sangdi Gu, Chih-Yung Wen, Jiaao Hao*	Eight-Point Focused Laser Differential Interferometer for Fluctuation Measurements in the T4 Stalker Tube (421) *Ramprakash Ananthapadmanaban, Srinath Lakshma, David Mee, Ananthanarayanan Veeraragavan*	Explosively Driven Shock Tube and Schlieren Technique to Visualize Blast Wave Propagation through Different Material Interfaces (217) *Therese Schunck, Myriam Bastide, Dominique Eckenfels, Laurent Sinniger, Thierry Ottie, Yannick Stehlin*	Experimental investigations of three-dimensional shock-wave/boundary-layer interactions at Mach 6 hypersonic flow (423) *Srinath Lakshman*	Force measurements on a free-flying cone/square pyramid model in a shock tunnel (367) *Shuto Yatsuyanagi, Hideyuki Tanno*	Combustor Length and Reactant Concentration Effects on Shuttling Transverse Detonation Wave Modes (30) *Xin Huang, Wenhao Xu, Po-Hsiung Chang, Zhen Wei Teo, Jiun-Ming Li, Chiang Juay Teo, Boo Cheong Khoo*	Study of the Stagnation Point Boundary Layer in Hypersonic Magnetohydrodynamic Flows (134) *Kai Luo, Danyang Li, Qiu Wang, Jinping Li, Wei Zhao*
14:10	Multi-Fidelity Modelling of Thermochemical Nonequilibrium in Oxygen Flows (288) *(S) Himanshu Khatri, Liwei Zhang*	Boundary Layer Velocity Measurements in a Detonation-Driven Hypersonic Shock Tunnel (119) *Tianshu Wu, Yupeng Li, Jiwei Li, Yejun Wang, Yutao Huo, Chenglong Guo, Qiu Wang, Wei Zhao*	Numerical Analysis of Shock-Tandem Bubble Interaction - Insights from Lamb Vector Divergence, Pressure Contours, and Vorticity Transport Equation (246) *(S) Nithin Krishnan S, Ribhu Pal, Arnab Roy, Parthasarathi Ghosh*	Massively-Separated Turbulent Shock-Wave/Boundary-Layer Interactions in Hypersonic Flows with Varying Mach and Reynold Numbers (234) *Romie Bura, Ahmad Riyadl*	The Role of Junction Curvature in the Origin of Heat Streaks on Swept Geometries in Hypersonic Flows (291) *(S) Jacob Currin, Jacob Smotzer*	Large-Eddy Simulation of Sound Generation within a Scramjet Engine (310) *(S) Ramandeep Kaur*	Computational Investigation of an Air-Breathing Lorentz Engine (ABLE) for Hypersonic Flight (425) *(S) Roshan John Kurian, Vincent Wheatley, Alexis Lefevre, Robert Watt, Nicholas Gibbons*
14:30				Shock-Boundary Layer Interactions in Double Ramp Flow in the Presence of Curvature (410) Abhinav Aggarwal, Rajesh Ranjan	Co-linear Focused Laser Differential Interferometry and High Speed Schlieren Measurements of Supersonic Cylinder Near Wake (160) Ying Luo, Alex Acosta, Joanna Austin, Hans Hornung		Extension of thermionic electron emission boundary conditions for hypersonic flow to the presence of a near-surface electron sheath (204) (S) Shahzeb Imran, Vincent Wheatley, Dale Pullin
14:50 - 15:20	**Coffee Break** (Building 49, AEB)						
15:20 - 15:40	**Farewell** (Room: 49-200)						

Poster Session Details

The Poster Session with Drinks will be held on **Tuesday 8 July from 16:20 - 18:00** in **Room 49-301.**

Poster Session with Drinks

Poster Number	Topic: Atmospheric Entry
01	Heating Experiments of Silicon-based Heat-resistant Materials in High-enthalpy Flows and Its Optical Measurements (137) Masato Funatsu, Kento Tsukada, Masaya Kamatari, Shunsuke Ono
02	Numerical study of the inflation process of Mars parachute system with different combinations of fabric and structural permeabilities (205) Xiaopeng Xue, Dangjun Zhao, Degui Yang, Buge Liang, He Jia, Tianqi Zou
03	A Framework for Design Optimization of Mars Entry Module Using a Rapid Aero-Thermodynamic Analysis Program (314) (S) Hoonjung Yeo, Jae Gang Kim, Kyu Hong Kim
04	Modeling of Breakup Dynamics of Space Debris during Hypersonic Atmospheric Entry (361) Sung Min Jo, Jaeseong Han

Poster Number	Topic: Chemical Kinetics
05	Comparison of DSMC thermochemical models with DMS calculations (182) Savio Poovathingal, Ethan Huff

Poster Number	Topic: Detonation, Combustion and Ignition
06	Calculation Model of Wall Heat Flux in Kerosene Two Phase Rotating Detonation Combustor (34) (S) Yingchen Shi, Wenqi Fan, Haocheng Wen, Bing Wang
07	Understanding on multi-dimensional aerodynamics of detonations in small size rectangular channels (131) (S) Daoping Zhang, Zhuo Xu, Gang Dong
08	A theoretical prediction of detonation front under lateral di-vergence effect (135) (S) Yuan Wang, Kang Tang, Gang Dong
09	Experimental Study on Ignition Delay Time and Ignition to Detonation Transition of NOFBX Propellant Based on Shock Tube (232) (S) Kai Pang, Shengyu Pang, Xinyan Li, Yugan Liao, Xiao Hou
10	Study on the Stationary Characteristics of Oblique Detonation Across Various Reaction Rate Distribution (280) Kepeng Yao, Chun Wang, Zonglin Jiang, Guilai Han
11	Effect of blast-wave trap with cushion materials installed on an L-shaped square tube on blast-wave forms (340) Tomotaka Homae, Yuta Sugiyama, Takahiro Tamba
12	Characteristics behavior of detonation waves in the combustor 100 RDE with H2/Air (402) (S) Hirohito Suzuki, Rintarou Suzuki, Shinji Mabuchi, Mizuki Toyoda, Naoki Okamura, Toshiharu Mizukaki

Poster Number	Topic: Diagnostics and Flow Visualization
13	Application of 3D Reconstruction Method for the Density Field of Underexpanded Jet Using Background Oriented Schlieren (267) (S) Sakuma Shin, Ogasawara Yuki, Nose Narumi, Udagawa Shinsuke, Ishibashi Ayumu, Hirose Yusuke, Inage Taturo, Yamagishi Masato, Ota Masanori
14	Time-Series Measurement of Unsteady Pressure Fields Induced by Shock Waves Under Atmospheric Pressure Conditions Using Pressure-Sensitive Paint (380) Daiju Numata, Takeru Kawashima, Kiharu Yoneyama, Yuma Kawamata
15	High-precision telescopic flow visualization with wavefront correction (407) (S) Moe Yatagai, Takeo Miinezaki, Shin Oya, Toshiharu Mizukaki

Poster Number	Topic: Facilities and Instrumentation
16	Novel Evolutionary Algorithm for Optimization of Free-Piston Driver Fill Conditions (220) (S) Liam Heffernan, Toby van den Herik, Chris James

Poster Number	Topic: High Enthalpy Gas Dynamics
17	Experimental and Numerical Investigation of Air Radiation in Hypersonic Expanding Flow (337) (S) Senhao Zhang, Jiaying Wang, Tianrui Bai, Yixin Xu, Xiaoyuan Zhang, Shizhong Zhang, Xin Lin, Jinping Li, Fei Li

Poster Number	Topic: Medical and Biological Applications
18	Experimental Investigation of Shock Wave Effects on Porosity Variations in Human Tooth (390) (S) Numan Ahamed N, Niyati Shanbhag, Nihad Ahmed, Sudarshan B

Poster Number	Topic: Multiphase Flows
19	Study on Shock Wave Flow Generated During the Collapse of an Air Bubble in Water (18) (S) Rajasekar Jayabal, Minoru Yaga, Heuy Dong Kim

Poster Number	Topic: Nozzle Flows and Supersonic Jets
20	Gas Density Effect on a Linear Shrouded Aerospike Nozzle (97) Kao-Chun Su, Kung-Ming Chung, Ping-Han Chung, Konstantinos Kontis

Poster Number	Topic: Numerical Methods
21	Physics-assisted Machine Learning Algorithm for Optimized Grid Generation for Capturing Shocks in Rarefied Hypersonic Conditions (243) (S) Rachakonda Naga Sai Prakash, Nishant Sharma, Tapan Mankodi, Niranjan Sahoo
22	Predicting the Breakdown of Continuum Mechanics for Kinetic and Continuum Simulations of Rarefied Flows (393) (S) James Taleb

Poster Number	Topic: Plasmadynamics and Magnetohydrodynamics
23	Numerical Study of Magnetohydrodynamics at Moderate Magnetic Reynolds Numbers (271) (S) Sebastiaan Van Oeveren, David Gildfind, Vincent Wheatley, Rowan Gollan

Poster Number	Topic: Propulsion
24	Analytical studies of oblique detonation wave (ODW) combustor for hypersonic airbreathing engine application (388) (S) Sayantan Saha

Poster Number	Topic: Shock Wave Interaction with Various Media
25	Fundamental Experimental Study on the Evaluation of the Interaction of Shock Wave on Structures (206) Kiyonobu Ohtani, Toshihiro Ogawa, Daiju Numata, Atsuhiro Nakagawa

Poster Number	Topic: Shock Wave Reflection, Interaction, and Focussing
26	Numerical study of the interaction between a converging shock wave and an offset cylindrical bubble containing either Neon or Argon (14) Dan Igra, Ozer Igra
27	Study of shock wave diffusion passing through diagonal circular cylinder array (17) Kazutaka Kitagawa, Homare Iwatsuki, Hayate Ueda, Yoshiharu Tamaki, Taro Imamura
28	Reduced order model for Mach stem height estimation using physics informed neural network in weak shock reflection regimes (369) Sivaprasad Gangadharan, Rajesh G

Poster Number	Topic: Shock Waves in Internal Flows
29	Experimental investigation of plasma energy deposition control on a transverse jet (8) (S) Ao Wang, Lifeng Tian, Hao Ding

Poster Number	Topic: Shock Waves in Liquids
30	Dynamic behavior of bubble pulsation wave propagation in small scale Underwater explosion (192) Hayate Ueda, Kazutaka Kitagawa, Shiro Kubota, Ken Okada, Tomoharu Matsumura, Takahiro Tamba

Poster Number	Topic: Shock Waves in Solids
31	The Impact of Detonation Wave Drive on the Motion of Semi-Prefabricated Fragments with Different Groove Arrangements (132) (S) Zhifei Luo, Yaohui Chen
32	Reversible Phase Transitions in Chalcogenide Nanoparticles Driven by Acoustic Shock Waves Using a Shock Tube (334) S.A. Marin Britto Dhas, Oviya Sekar, F Irine Maria Bincy, Ikhyun Kim

Poster Number	Topic: Shock/Boundary Layer Interaction
33	A Direct Numerical Simulation Study of High-Enthalpy Shock/Turbulent Boundary Layer Interactions (62) Yanhua Zhu, Xinliang Li, Hongwei Liu
34	Effect of Micro Vortex Generators in Improving Shock Wave Boundary Layer Control (302) (S) Sai Goutham Viyyapu, Kazuya Tajiri

Poster Number	Topic: Supersonic and Hypersonic Flows
35	Role of Optimization in Hypersonic Inlet Design for Hydrocarbon-Fueled Scramjet Engines (45) Sai Siddharth S, Mani Arasu
36	On the bow-shock stand-off distance during acceleration (69) (S) Irshaad Mahomed, Irvy Gledhill, Hamed Roohani
37	3D Digital Image Correlation and Laser Displacement Measurement on a Cantilever Plate in Hypersonic Flow (138) Sandeep Soman, Kartikey Tiwari, Saravanan Selvaraj, Jagadeesh Gopalan, Srisha Rao M V
38	Experimental Measurement of Static and Dynamic Aerodynamic Coefficients from Shadowgraph Images in Hypersonic Flow (176) (S) Eunju Kim, Minhyun Han, Soo Hyung Park
39	Design And Validation of a Drag Balance in a Hypersonic Wind Tunnel (177) (S) Minhyun Han, Eunju Kim, Soo Hyung Park
40	Fast simulation of hypersonic flow in compression corner ramp via vision transformer (230) (S) Yuan Jia, Chih-Yung Wen Wen, Chi Zhang, Jiaao Hao, Hao Ma, Zhengtong Li
41	Numerical Study on the Influence of Surface Corrugations on Heat Transfer in Shock-Wave/Turbulent Boundary Layer Interactions (252) Abhigyan Roy, Muruganandam T M
42	A Numerical Examination of the Origin of Heat Streaks on a Wedge with Swept Edges at Angle of Attack in Hypersonic Flow (295) Jacob Smotzer, Brett Van Poppel, Ivett Leyva, Austin Garcia, Koen Groot, Bryan Morreale
43	Unsteadiness in a 2D hypersonic cavity flow with a deep sub-cavity (370) (S) Deepthi Kanigiri
44	Formulation of a novel turbulence model for transonic flows using Physics informed neural network (373) (S) Satyajit Suresh Meti, Sivaprasad Gangadharan, Rajesh Gopalapillai

Instructions for Poster Presentations

- ISSW35 staff will provide pins/tape/staples for mounting your poster.
- You must print your own poster at size A1 (59.4 cm by 84.1 cm) in portrait orientation
- Posters are to be set up beneath your poster number in **Room: 49-301**
- Your poster must be put up by end of day **Monday 7 July**
- Presenters must stand with their posters **16:20 – 18:00 on Tuesday 8 July**

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Tangalooma Social Day Details (Wednesday 9 July)

Location of ferry terminal on the mainland

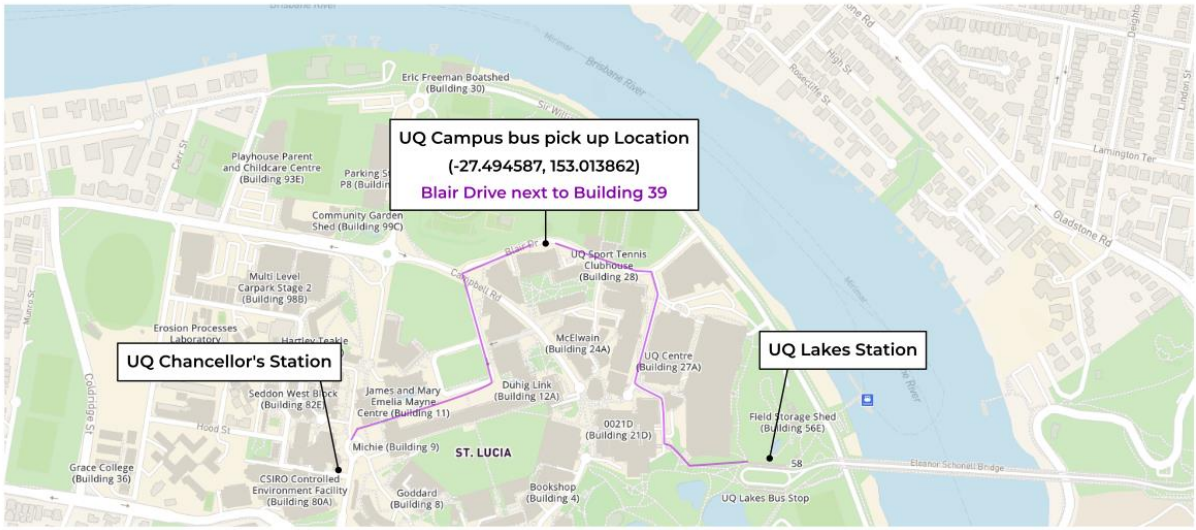
- Ferry will depart Holt Street Wharf at 9:30am (220 Holt St, Pinkenba)
- Buses will be available to and from the ferry terminal on the social day
- Two pickup locations are available for the buses in the morning (see below)
- *If you do not wish to take the bus, you can drive* (parking at the ferry terminal is $20 AUD per day).

Bus collection points in the morning (Morning of Wednesday 9 July)

- **Location 1 (City):** 8:30am, 270 Albert St near Wickham Park (-27.466429, 153.022061)
- **Location 2 (UQ Campus):** 8am, 39 Blair Drive next to Building 39 (-27.494587, 153.013862)
- You will be given your pick up location at time of registration

Brisbane City Bus Pick up Location (for Social Day)

UQ St Lucia Campus Bus Pick up Location (for Social Day)



Information about social day activities and schedule can be found on the next page.

Social Day Activities

- When you register, you will be given a token for your social day activity (Wreck Sightseeing, Beach Segway Tour, Quad Tour, Desert Safari, Whale Watching, or Snorkelling)

Social Day Schedule

Wednesday 9 July	
8:00-9:00	**Travel by Bus to Ferry Terminal** Two pick up locations available: City and UQ Campus (see previous page)
9:00-9:30	**Ferry Boarding** (Strict departure at 9:30 am)
9:30-10:45	**Travel by Ferry to Tangalooma**
11:00-11:30	**Morning Tea**
11:30-12:30	**Allocated Activities and Free Time**
12:30-13:30	**Lunch**
13:30-17:30	**Allocated Activities and Free Time**
17:30-19:00	**Return to Brisbane** Return Ferry 1 departs from island at 16:45, Return Ferry 2 departs at 17:30

Social Day Activity Times (on the Island)

Locations for activities will be advised on the social day. Arrive at your activity 5 minutes early.

Group	Whale Watching	Wrecks Sightseeing	Beach Segway Tour	ATV Quad Tour	Desert Safari	Snorkelling
Group 1	11:30 – 15:00	11:30 – 12:30	11:30 – 12:15	11:45 – 12:45	13:15 – 15:00	15:00 – 16:45
Group 2	-	14:00 – 15:00	12:00 – 12:45	13:45 – 14:45	-	-
Group 3	-	14:45 – 15:45	14:00 – 14:45	14:45 – 15:45	-	-
Group 4	-	-	14:30 – 15:15	15:45 – 16:45	-	-
Group 5	-	-	15:00 – 15:45	-	-	-
Group 6	-	-	15:30 – 16:15	-	-	-

Conference Banquet (Thursday 10 July)

Banquet Location and Travel

- The ISSW35 Banquet (Conference Dinner) will be held at the Sofitel (Brisbane City) in the Ballroom Le Grand
- Timing: 18:00 (6 pm) arrival with seating at 18:45 (6:45 pm)
- Address: 249 Turbot St, Brisbane City *(above the central train station)*
- Delegates will need to arrange their own transport to the banquet
- You can get to the Sofitel Banquet location using Brisbane's public transport (plan your journey with Google Maps, the TransLink app, or at **translink.com.au**
- The 412 and M2 bus routes go from UQ Campus to the City

Map Showing Sofitel (Banquet Location) and Surrounding City

UQ Short Course on Hypersonic Shock Tube Technology (Saturday 5 July)

Locations and Timing

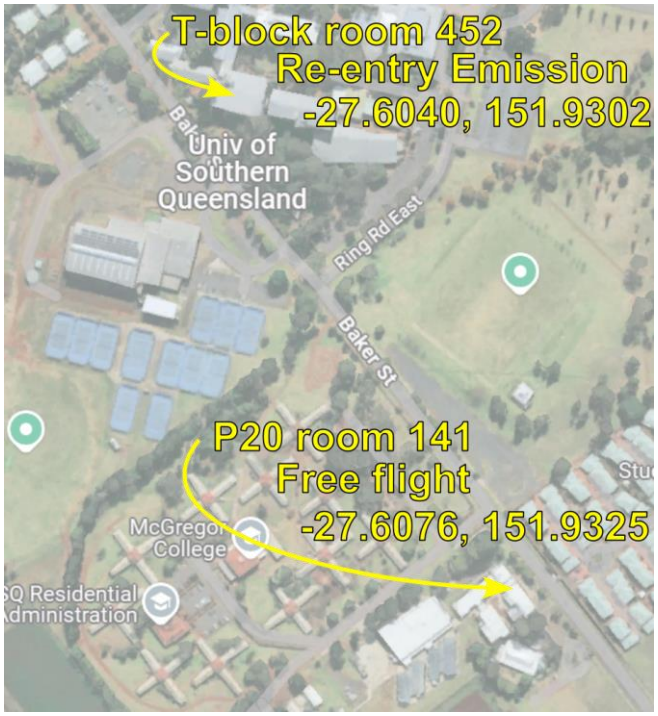
Time	Saturday (July 5th)
	Room: **50-T203 (Hawken Engineering Building, UQ)**
8:30-9:20	Registrations (for Short Course and ISSW35)
9:20-11:00	**UQ Short Course* Session 1** **Introduction to Hypersonic Shock Tunnels and Expansion Tubes** Dr. David Gildfind
11:00-11:30	Coffee Break
11:30-13:10	**UQ Short Course Session 2** **Optical Diagnostics in Shock Tunnels and Expansion Tubes** Dr Tristan Vanyai, Dr Yu Liu
13:10-14:10	Lunch
14:10-15:40	**UQ Short Course Session 3** **Applications of Hypersonic Shock Tunnels and Expansion Tubes** Professor Anand Veeraragavan, Dr. Christopher James
15:40-16:20	Coffee Break
16:20-17:40	**UQ Short Course Session 4** **Modelling Hypersonic Flows in Support of Experiments** Associate Professor Rowan Gollan, Dr. Nicholas Gibbons

UniSQ (Toowoomba) Workshop Details (Monday 14 July)

Overview

- Welcome tea and coffee at each workshop location from 9:30 am
- Each workshop commences at 10:00 am
- A light lunch will be provided.

Map – UniSQ Toowoomba Campus Buildings and Rooms



Locations and Timing

Mon 14 July 9:30 - 16:00		
	Room: T-Block Room 452	Room: P20 Room 141
9:30-10:00	**Welcome Tea & Coffee**	**Welcome Tea & Coffee**
10:00-16:00	**Workshop: Re-entry Emission Signatures**	**Workshop: Wind Tunnel Free-flight Testing**

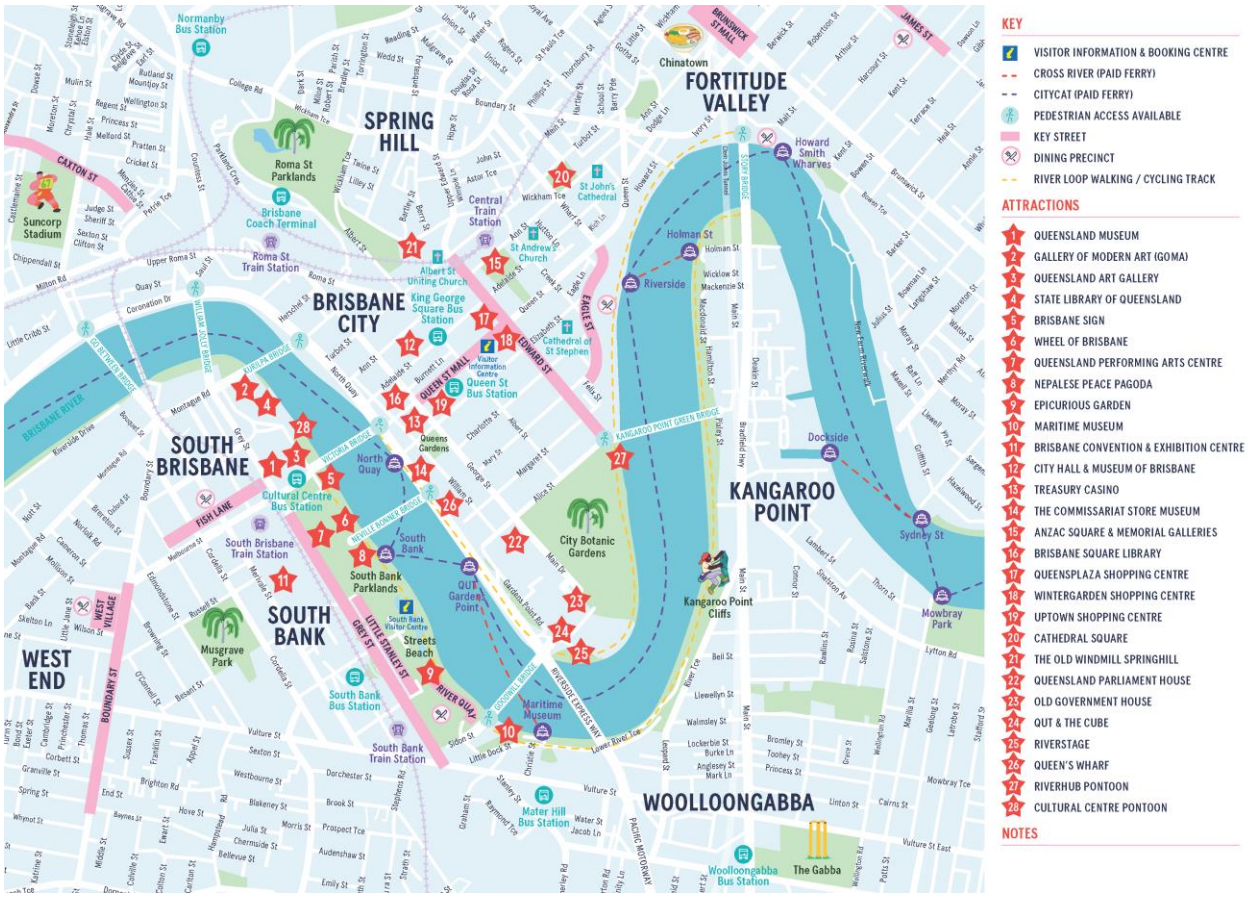
General Information

Brisbane City and Surrounds

Brisbane is the capital city of the Australian state of Queensland. Being a semi-tropical climate, Brisbane is a great place to visit in winter (when ISSW35 is being held).

The greater Southeast Queensland region has many great things to see such as native wildlife, whale watching, hiking, wineries, and the great beaches of the Gold Coast and the Sunshine Coast.

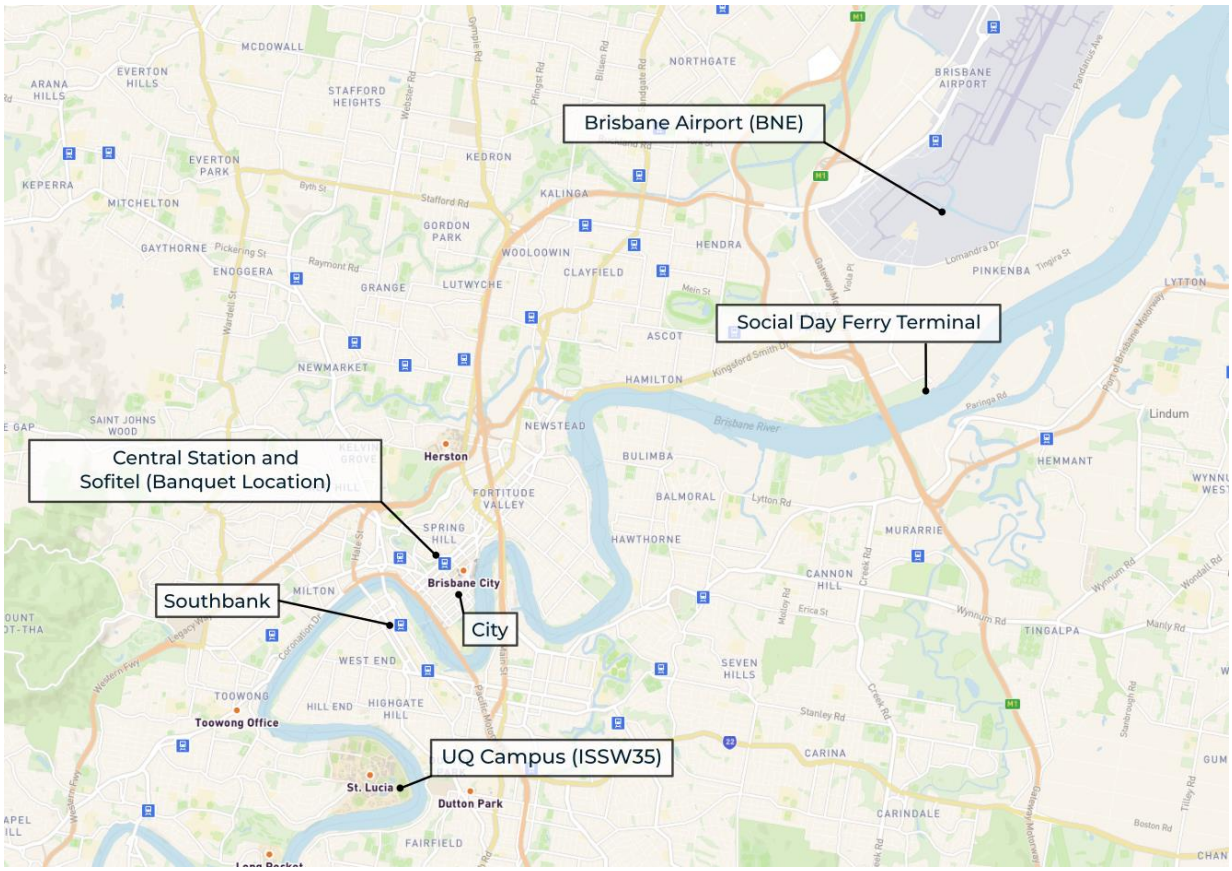
Brisbane City Map and the South Bank



Find places to eat and drink in South Brisbane, South Bank, Brisbane City, Fortitude Valley, and the West End.

Visit **visit.brisbane.qld.au/things-to-do/eat-and-drink**

The Conference Location – The UQ St Lucia Campus



Travel to the Conference Location

There is a direct train line from both the domestic and international terminals of the Brisbane airport to the city centre via the Brisbane Airtrain. The Airtrain from the international terminal to Brisbane's Central or Roma St Stations in Brisbane City is approximately 30 minutes and each fare costs $18.96 AUD.

Taxis and Ubers are also readily available at the airport to take delegates to or from the airport to Brisbane city for a typical cost of around $50 AUD.

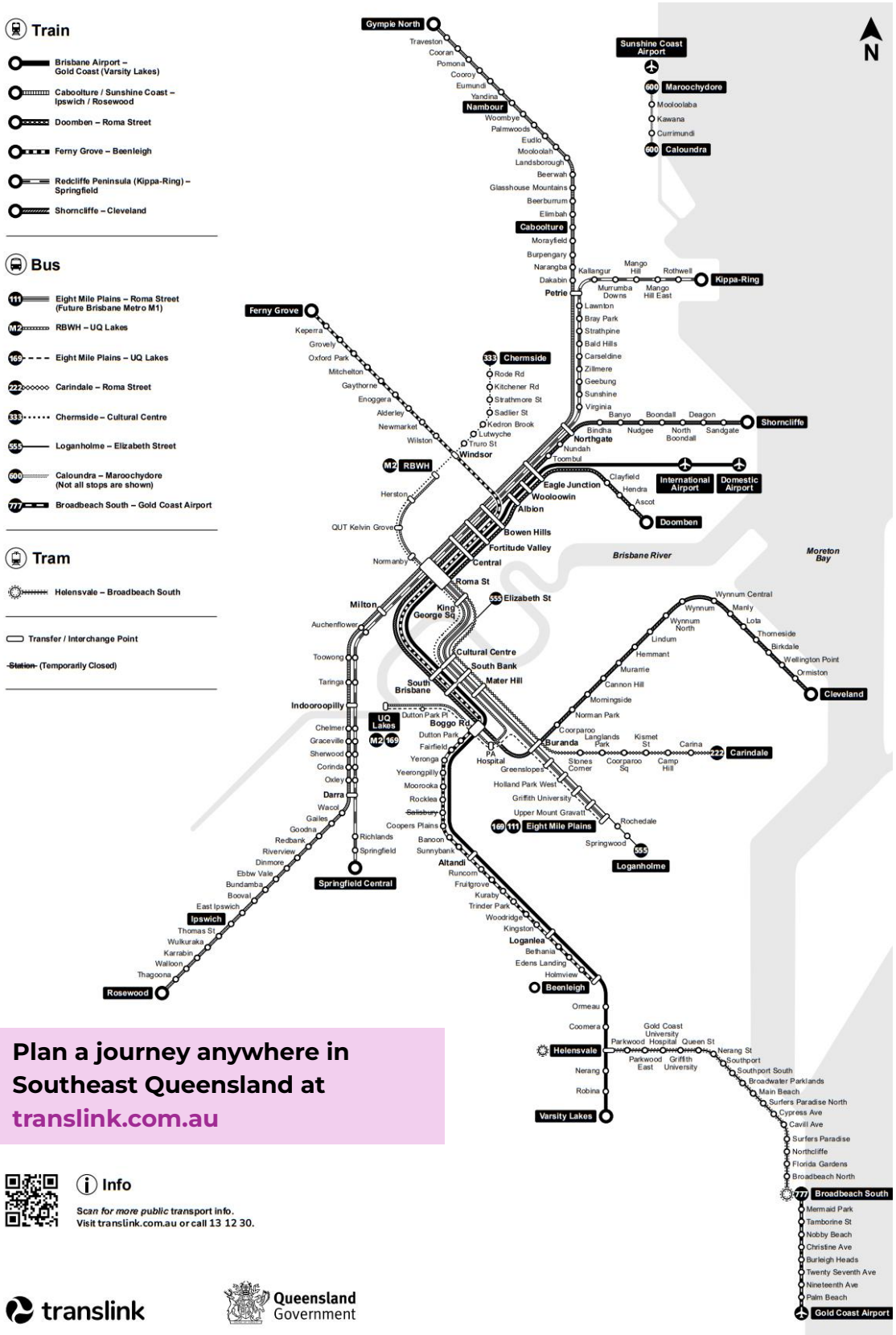
Once settled in Brisbane, use the **translink.com.au** website, Google Maps, or the TransLink app to plan your journey from your Hotel to the UQ Lakes or UQ Chancellor's place bus stop.

All public transport can be paid for with Visa, MasterCard, or GoCard when entering the vehicle or on the platform. GoCards can be purchased and prepaid from all major bus and train stations if desired.

Bus routes M2, 192, and 412 run between UQ Campus and the city. The nearest train station to the conference location (UQ Campus) is Park Road Station with frequent connecting bus services to the UQ Campus via the adjacent Boggo Road Bus Station.

General Travel in Southeast Queensland

Other than the Airport Airtrain, all public transport in Queensland costs $0.50 AUD (including any city-cat ferry, train, buses, or Gold Coast tram).



Plan a journey anywhere in Southeast Queensland at translink.com.au

Info

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Visit translink.com.au or call 13 12 30.

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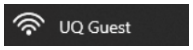
WiFi Details at UQ Campus

UQ Guest Wifi

Use UQ's Guest WiFi while on campus: 

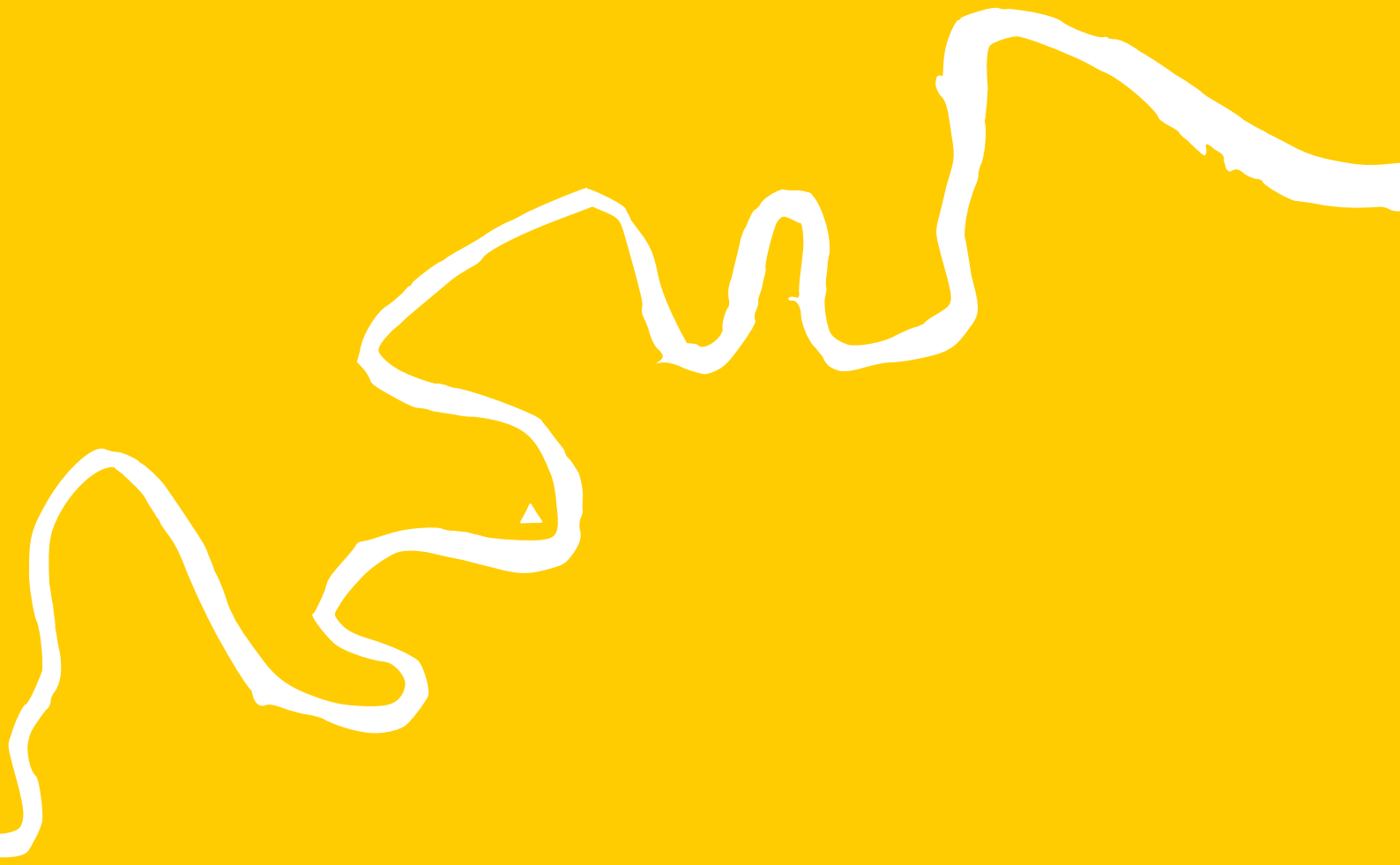
- Select the "UQ Guest" WiFi option on your mobile device or laptop and wait for your web browser to load the portal.
- Accept and agree to the terms and conditions to join the WiFi for free.

Eduroam Network

UQ Campus is a part of the Eduroam network. If you use Eduroam at your home campus / institution, your device should automatically connect to the Eduroam WiFi network on UQ Campus.

Notes

Notes



ISSW35:

SHOCK WAVES DOWN UNDER