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University



ISABE 2019 >>>

22 - 27 SEPTEMBER

INTERNATIONAL SOCIETY FOR AIR BREATHING ENGINES

>>> **CANBERRA, AUSTRALIA**

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future



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WELCOME TO CANBERRA, AUSTRALIA

Australia is a strong and prosperous nation that, given its location in the Southern Hemisphere, bridging the Indian, Pacific and Southern Oceans, relies heavily on airbreathing propulsion to remain an integral part of the world.

As a consequence, Australia is strongly dependent upon the gas turbine for air transport to service our tourist industry and maintain international trade via our own airlines and those that service our shores. The Australian Defence Force are also heavy users of gas turbines in their aircraft, ships and even tanks. In addition, Australia has a preeminent position as a world leader in hypersonic research, particularly in the development and flight-testing of scramjet propulsion systems. This year's conference theme "Disrupting Distance with Advanced Propulsion Technologies" is thus particularly apt for ISABE's return to Australia.

Australia has a longstanding tradition in ISABE and has been a strong supporter since the beginning. UNSW Canberra and its academic, industrial, defence and government partners would like to welcome the ISABE conference back to Australia in 2019. It will have been almost a quarter of a century since the ISABE conference last graced our shores and it is only fitting that we now hold the 2019 conference in Canberra, the nation's capital.

Canberra is a dynamic city, often known as the "Bush Capital". It combines the nation's grand institutions and a vibrant restaurant and café culture in the idyllic setting of open spaces and countryside, bringing together lakes, rolling plains, forest and mountains.

It is populated by all manner of native flora and fauna most especially our kangaroos. Furthermore, Canberra is best experienced during the September Spring time when we will host ISABE2019, which will also coincide with the start of Canberra's famous Floriade festival.

Canberra is home to two of the nation's leading universities, as well as the headquarters of the Australia Defence Force, Airservices Australia, the Civil Aviation Safety Authority, and the Australian Transportation Safety Bureau. Hidden in the hinterland of the Australian Capital Territory, within half an hour's drive of the city, the tracking station at Tidbinbilla forms a vital part of NASA's Deep Space Communications Network, one of three such ground stations spread around the globe. Tidbinbilla is now part of Canberra's rapidly growing role as the space hub of Australia.

We are honoured to welcome you all back to Australia in 2019 for the 24th ISABE Conference, where you can experience the best of what Canberra has to offer.

Professor Andrew Neely
UNSW Canberra
ISABE Vice President and ISABE2019 Conference Chair

Committee



ISABE Steering Committee

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The late Dr. James E. Bubb

President:
Prof. Richard 'Ric' J Parker

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Mr Sean McCreton (UNSW Sydney)

Mr Liam McQuellin (UNSW Canberra)

Mr Jeremy Moran (UNSW Canberra)

Dr Danielle Moreau (UNSW Sydney)

Mr Kannan Munusamy (UNSW Canberra)

Dr Evan Smith (RAAF)

Mr Paulo Vasconcelos (UNSW Canberra)

Conference Schedule

22 Sunday	23 Monday	24 Tuesday	25 Wednesday	26 Thursday	27 Friday
	7.30 - 9.00 Registration & Coffee	7.30 - 8.00 Registration & Coffee	7.30 - 8.00 Registration & Coffee	7.30 - 8.00 Registration & Coffee	7.30 - 8.00 Registration & Coffee
		8.00 - 9.00 Shinji Suzuki (ICAS)	8.00 - 9.00 Alex Simpson (GE)	8.00 - 9.00 Jörg Sieber (MTU)	8.00 - 9.00 Xiaofeng Sun (Beihang)
	9.00 - 10.00 Conference Opening	9.00 - 10.00 Henrik Runnemalm (GKN)	9.00 - 10.00 Alex Passerini (Qantas)	9.00 - 10.00 Kevin Bowcutt (Boeing)	9.00 - 10.00 Raquel Salmeron (Airservices)
	10.00 - 11.00 Paul Stein (RR)	10.00 - 10.30 Coffee Break	10.00 - 10.30 Coffee Break	10.00 - 10.30 Coffee Break	10.00 - 10.30 Coffee Break
	11.00 - 12.00 Janet Kavandi (NASA)	10.30 - 12.00 Technical Sessions	10.30 - 12.00 Technical Sessions	10.30 - 12.00 Technical Sessions	10.30 - 12.00 Technical Sessions
	12.00 - 13.00 Lunch	12.00 - 13.00 Lunch	12.00 - 13.00 Lunch	12.00 - 13.00 Lunch	12.00 - 13.00 Lunch
	13.00 - 14.00 Adam Dissel (REL)	13.00 - 14.00 Thomas Prete (P&W)	13.00 - 14.00 MZ Siddique (GTRE)	13.00 - 14.00 Cath Roberts (RAAF)	13.00 - 14.30 Discussion Panel Disrupting Distance with Advanced Technologies
		14.00 - 15.00 Technical Sessions	14.00 - 15.00 Technical Sessions	14.00 - 17.30 Conference Technical Excursions	14.30 - 15.30 Conference Closing
15.00 - 17.00 Registration	15.00 - 15.30 Coffee Break	15.00 - 15.30 Coffee Break		15.00 - 15.30 Coffee Break	15.30 Farewell Coffee
	15.30-16.30 Hussein Abbass (UNSW)	15.30 - 16.30 Jim MacLeod (NRC)		15.30 - 16.30 Michael Smart (UQ)	
	16.30 - 18.00 Technical Sessions	16.30 - 18.00 Technical Sessions		16.30 - 17.30 Technical Sessions	
17.00 - 19.00 ISABE Welcome Drinks National Convention Centre	18.30 Reaction Engines Industry Dinner Lainie Anderson Australian War Memorial	19.00 ISABE Board & Invited Speakers Dinner (by invitation only) Boat House Restaurant	19.00 AIAA Student Networking Reception (by invitation only) Novotel Canberra	18.00 ISABE Gala Banquet National Arboretum	

9.00 - 14.00
RAeS
Cool
Aeronautics
STEM
Outreach Event
for local high
school girls



Conference Venues

1 The National Arboretum

Address:
Forest Dr, Molonglo Valley ACT 2611

2 Novotel

Address:
65 Northbourne Ave, Canberra ACT 2601

3 The Australian Transport Safety Bureau

Address:
62 Northbourne Ave, Canberra ACT 2601

4 Aircservices Australia

Address:
25 Constitution Ave, Canberra ACT 2601

5 National Convention Centre Canberra

Address:
31 Constitution Ave, Canberra ACT 2601

6 Australian War Memorial

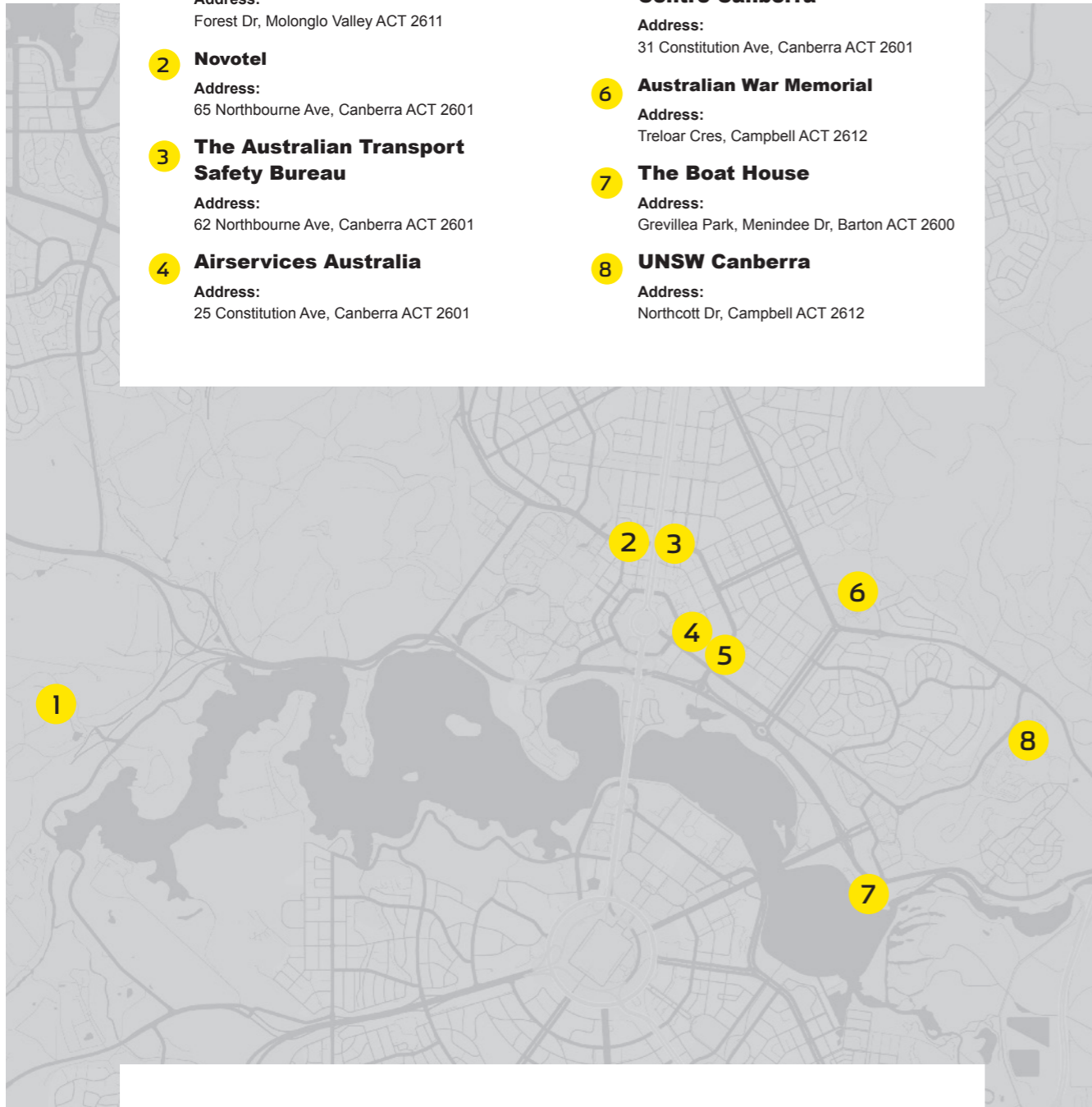
Address:
Treloar Cres, Campbell ACT 2612

7 The Boat House

Address:
Grevillea Park, Menindee Dr, Barton ACT 2600

8 UNSW Canberra

Address:
Northcott Dr, Campbell ACT 2612




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Social Events

The conference will include a packed social program for delegates and accompanying persons including memorable dinners at some of the most outstanding venues in the Nation's capital.

Networking lunches and coffee breaks will also be served throughout the conference for all delegates.



Sunday Evening

ISABE Welcome Drinks
National Convention Centre Canberra
(for all delegates and accompanying persons)

Enjoy drinks and canapes following registration at the conference venue.



Monday Evening

Reaction Engines Industry Dinner
Australian War Memorial
(for all delegates and accompanying persons)

Join us for dinner and drinks in the ANZAC hall at the Australian War Memorial where you can experience the spectacular sound and light shows under the unique aircraft collection and hear from Churchill Scholar, Lainie Anderson as she recounts the *Flight That Changed the World*.



Tuesday Evening

ISABE Board & Invited Speakers Dinner
The Boat House Restaurant (by invitation only)

Dinner and drinks in one of Canberra's ultimate dining experiences. Perfectly executed cuisine, memorable service and unmatched views across Lake Burley Griffin.



Wednesday Evening

AIAA Students' Networking Reception
Novotel Canberra (by invitation only)

A networking evening for our student delegates and VIP guests with food and drinks provided.



Thursday Evening

ISABE Gala Banquet, Village Centre
The National Arboretum
(for all delegates and accompanying persons)

The culmination of the conference social calendar will be a memorable dinner (with a few surprises) in the spectacular Village Centre at the National Arboretum overlooking Canberra.



Accompanying Persons

Those who are accompanying delegates to ISABE2019 can register for the Accompanying Persons Program. This will include a dedicated excursion, with catered lunch, in the Canberra area as well as informal guided meet ups on the other days at some of the main cultural and social locations around central Canberra. Registration also includes tickets to the Welcome Reception, the Industry Dinner and the ISABE Conference Banquet.

Sunday

Evening: Welcome Drinks at the NCCC

Monday

Morning: Sightseeing cruise on Lake Burley Griffin followed by a tour of Canberra's National Exhibition Centre.

Afternoon: At leisure to explore Floriade, Australia's biggest celebration of spring.

Evening: Reaction Engines Industry Dinner at the Australian War Memorial.

Tuesday

Morning / Afternoon: Excursion to the Canberra Hinterland with wine tastings at several wineries and lunch at a local vineyard and smokehouse followed by a visit to a local chocolate maker.

Evening: At leisure to experience Canberra's wide range of eateries (those accompanying Board Members or Keynote speakers - Dinner at the Boat House Restaurant)

Wednesday

Morning: At leisure to explore Canberra.

Afternoon: Conference excursion to the Tidbinbilla Nature Reserve and the NASA Canberra Deep Space Communications Complex.

Evening: At leisure to experience Canberra's wide range of eateries.

Thursday

Morning: A visit to the National Museum of Australia followed by an optional walking tour of Reconciliation Place at 11.45 am.

Afternoon: Lunch (not included) at the National Library of Australia. At leisure to explore King Edward Terrace and surrounds: national galleries, museums and/or Parliament House (free tours available for each)

Evening: ISABE Gala Banquet at the National Arboretum.

Friday

Informal meet ups, otherwise at leisure to explore Canberra.

Invited Speakers



Dr. Paul Stein
CTO, Rolls-Royce



Dr. Janet L. Kavandi
Director, Nasa Glenn Research Center



AVM Catherine Cath Roberts
Head of Air Force Capability



Dr. Kevin G. Bowcutt
Chief Scientist of Hypersonics, Boeing



Dr. Adam Dissel
President, Reaction Engines Inc.



Mr. Thomas Prete
Engineering Vice President,
Pratt & Whitney Military Engines



Prof. Michael Smart
Chair of Hypersonic Propulsion,
University of Queensland



Ms Lainie Anderson
Aviation Historian and Churchill Fellow



Prof. Xiaofeng Sun
Professor of Aerospace Engineering
and Director of the Fluid and Acoustic
Engineering Laboratory, Beihang University



Mr Jim Macleod
NRC Fellow and Chairman of the Aircraft
Icing Research Alliance (AIRA)



Prof. Shinji Suzuki
President of ICAS



Dr. Joerg Sieber
Head of Innovation Management, MTU



Mr. Mz Siddique
Director GTRE



Dr. Alexander Simpson
Executive GE Aviation Cincinnati, Ohio



Dr. Raquel Salmeron
Air Traffic Management Network
Performance and Analysis Manager,
Airservice Australia



Dr. Henrik Runnemalm
Director of Research and Technology
at GKN Aerospace Engine Systems



Prof. Hussein Abbass
UNSW Canberra



Captain Alex Passerini
Chief Technical Pilot at Qantas

Discussion Panel

Friday Afternoon 27 Sept
“Disrupting Distance with Advanced Technologies”



Dr. Raquel Salmeron
Air Traffic Management Network
Performance and Analysis Manager,
Airservice Australia



Dr. Kevin G. Bowcutt
Chief Scientist of Hypersonics, Boeing



Capt. Lisa Norman
Manager Fleet Operations- Boeing 787,
Qantas



Dr. Nateri Madavan
Transformative Aeronautics Concepts
Program, NASA Aeronautics Research
Mission Directorate



Dr. Stéphane Burguburu
Head of Methodology, Design and
Simulation tools, Safran Aircraft Engines

The Facilitators



Prof. Richard J Parker
President ISABE



Dr. Bianca Capra
UNSW Canberra

Monday 23 Sept

07.30-09.00	Registration Main Foyer
09.00-10.00	Conference Opening (Royal Theatre)
10.00-11.00	Keynote (Royal Theatre) Dr Paul Stein (Rolls-Royce) <i>A New Age of Aviation Propulsion</i>
11.00-12.00	Keynote (Royal Theatre) Dr Janet Kavandi (NASA) <i>The Future of Aviation Research at NASA's Glenn Research Center</i>
12.00-13.00	Networking Lunch Ballroom
13.00-14.00	Keynote (Royal Theatre) Dr Adam Dissel (Reaction Engines) <i>Enabling High-Speed Propulsion</i>
14.00-15.00	Early Afternoon Technical Sessions
15.00-15.30	Networking Coffee Break Ballroom
15.30-16.30	Keynote (Royal Theatre) Prof Hussein Abbass (UNSW Canberra) <i>Artificial Intelligence. How our UNSW-Canberra research is transforming the Air to breathe smartness</i>
16.30-18.00	Late Afternoon Technical Sessions
18.00-18.30	Shuttle buses to the AWM Departure from the side of the NCC
18.30-22.00	Reaction Engines Industry Dinner, Australian War Memorial <i>Ms Lainie Anderson, The Flight That Shrank The World - 100th Anniversary of the Epic Air Race</i>
21.30-22.00	Shuttle buses back to Crowne Plaza Departure from the side of the AWM

Early Afternoon Session 14.00 - 15.00

14.00	14.30
Technical Session MoB1: Compressors 1 Room 1 Nicholls Theatre	
Chairs: Hans Mårtensson (GKN Aerospace), Byung Lee (Vantage Partners)	
ISABE-2019-24033	ISABE-2019-24049
Strategies for Multifidelity Optimization of Multistage Compressors with Throughflow and 3D CFD	An improved Prediction Model for Corner Stall in Axial Compressors with Dihedral Effect
Markus Schnoes, Andreas Schmitz, Georgios Goinis, Christian Voß and Eberhard Nicke	Jiabin Li and Lucheng Ji
Technical Session MoB2: Ramjets and Scramjets 1 Room 2 Menzies Theatre	
Chairs: Hideyuki Tanno (JAXA), Michael Smart (UQ)	
ISABE-2019-24110	ISABE-2019-24118
Dual Manifold Flow Control System for Gas-Generator Cycle Air Ramjet Engine	Anterior Fuel Streak Suitable for SHSI
Ryojiro Minato, Daisuke Nakata, Masaharu Uchiumi, Inaho, Yoshikawa, Hiromitsu, Yagihashi and Kouki Arimatsu	Shigeo Obata
Technical Session MoB3: Detonation & Pulsed Engines Room 3 Swan Room	
Chairs: Sean O'Byrne (UNSW Canberra), Ric Parker (ISABE)	
ISABE-2019-24254	ISABE-2019-24367
Fuel Injection, Mixing and Detonative Combustion in Model Detonation Engine	Dynamics Of Rotating Detonation Engines With A Pintle-Type Injector
Shikha Redhal, Jason Burr and Kenneth Yu	Takuma Sato, Fabian Chacon, James Duvall, Mirko Gamba, and Venkat Raman

Early Afternoon Session 14.00 - 15.00

14.00

14.30

Technical Session MoB4: Engine Emissions 1

Room 4
Murray Room

Chairs: Raquel Salmeron (Airservices), Weeded Ghedhaift (ONERA)

ISABE-2019-24038

Experimental Investigation on Impact of Jet Fuel Properties on Gaseous Emissions using a Gas Turbine Combustor

Chenxing Ling, Charith J Wijesinghe, Lukai Zheng and Bhupendra Khandelwal

ISABE-2019-24307

3D Simulation of Aircraft Emissions Dispersion in the CAEPport Area by Tracking Aircraft as Mobile Sources

W. Ghedhaïfi, L. Desprez, E. Montreuil, E. Terrenoire, T. Henry-Lheureux and F. Garnier

Technical Session MoB5: VSTOL and Thrust Vectoring 1

Room 5
Fitzroy Room

Chairs: Suresh Sampath (Cranfield), Daesung Lee (KARI)

ISABE-2019-24001

VSTOL Thrust Vectoring and Balancing: Degradation Mitigation Strategies

S Sampath, A Pellegrini, I Aslanidou and P Pilidis

ISABE-2019-24412

CFD Analysis on a Convergent Divergent Nozzle With and Without Obstacle Thrust Vectoring

Adel Mamdouh, Eslam Said Abdelghany, Gamal elhariry and Essam E Khalil

Technical Session MoB6: Inlets and Ducts 1

Room 6
Torrens Room

Chairs: Patrick Hendrick (ULB), Olivier Petit (Chalmers)

ISABE-2019-24020

Integrated Compressor Duct with Bleed: Experimental Validation of a Hybrid RANS/LES Approach

Elias Mikael Vagn Siggeirsson, Niklas Andersson and Markus Burak Olander

ISABE-2019-24124

Aerodynamic Test Campaign of next Generation Aggressive Intermediate Compressor Ducts

Fredrik Wallin, Philipp Langholf and Eberhard Nicke

Technical Session MoB7: Nozzles 1

Room 7
Derwent Room

Chairs: Ibrahim Sinan Akmandor (Pars Makina)

ISABE-2019-24397

Influence of Nozzle Geometry on Detonation-Driven and Shock-Driven Transient Supersonic Jet Flow

Bhavraj Thethy, Mohammad Rezay Haghdoost, Kilian Oberleithner, Damon Honnery and Daniel Edgington-Mitchell

ISABE-2019-24353

Numerical Analysis of Effects of Pintle Position on Flow in Planar Expansion-Deflection Nozzles

John Paul P, Joe Paul Martin M, Prasanth P Nair, Abhilash Suryan, Abhay Mohan and Heuy Dong Kim

Late Afternoon Session 16.30 - 18.00

16.30

17.00

17.30

Technical Session MoC1: Compressors 2

Room 1
Nicholls Theatre

Chairs: Byung J Lee (Vantage Partners), Hans Mårtensson (GKN Aerospace)

ISABE-2019-24050

An Evaluate Method for Axial Compressor Endwall Flow and Relevant Control Measures

Jiabin Li and Lucheng Ji

ISABE-2019-24067

High-Dimensional Multi-Fidelity Optimisation Of A 2.5 Stage Low Pressure Compressor

Stefan Hemmert-Pottmann, Christian Voß, Nicolai Forsthofer and Tim Schneider

ISABE-2019-24069

Flow Analysis and Optimization through Tuning of Rotor Blade Geometry for a High-loading Transonic Axial Flow Compressor Stage

Da Xu, Jinju Sun, Peng Song, Xuesong Wang and Youwei He

Technical Session MoC2: Ramjets and Scramjets 2

Room 2
Menzies Theatre

Chairs: Michael Smart (UQ), Hideyuki Tanno (JAXA)

ISABE-2019-24119

Free-flight Test of Scramjet Powered Vehicle in Shock Tunnel

Hideyuki Tanno, Tomoyuki Komuro and Kouichiro Tani

ISABE-2019-24121

The Supersonic Combustor Performance Change by Fuel Temperature Variation with Regenerative Cooling

Kyungjae Lee, Inyoung Yang, Yangji Lee and Sanghun Lee

ISABE-2019-24158

Aerodynamic Characteristics and Parameter Sensitivity Analysis of Hypersonic Airframe/ Inlet Integrated Full-Waverider Vehicle

Feng Ding, Jun Liu, Wen-hao Zhang and Shao-hua Chen

Technical Session MoC3: Simulation and Modelling 1

Room 3
Swan Room

Chairs: D. R. Reddy (NASA), Zafer Leylek (DSTG)

ISABE-2019-24009

A Hybrid Structured/Unstructured Grid Strategy for the Modeling of Technological Effects on Complex Turbomachinery Applications

L Castillon, M Soismier, MC Le Pape, B Maugars and B Michel

ISABE-2019-24010

Turbulence Model Development for Low & High Pressure Turbines Using a Machine Learning Approach

Harshal D Akolekar, Yaomin Zhao, Richard D Sandberg, Nicholas Hutchins and Vittorio Michelassi

ISABE-2019-24108

Direct Numerical Simulation of Separation-induced Transition in a Very-low-disturbance Environment through a Low-pressure Turbine Cascade

Siya Jiang and Song Fu



Late Afternoon Session 16.30 - 18.00

16.30 Technical Session MoC4: Materials, Structures and Failure 1 Room 4 Murray Room

Chairs: Joe Grady (NASA), Evan Smith (RAAF)

ISABE-2019-24098	ISABE-2019-24025	ISABE-2019-24201
Physically Based Versus Strain-Based Crack Indicators for Hot Cracking in Welded Structures	A Study of Cranking Effectiveness as a Treatment for Rotor Thermal Bow in Gas Turbines	Flow Characteristics of High Velocity Oxygen-Fuel Torch for Evaluating High Thermal Resistive Materials
Jonas Edberg, Joar Draxler and Jesper Mattsson Liljemark	EO Smith and AJ Neely	Rajesh Kumar Chinnaraj, Seong Min Hong, Phil Yong Oh and Seong Man Choi

17.00 Technical Session MoC5: Heat Transfer and Cooling Technology 1 Room 5 Fitzroy Room

Chairs: Sami Girgis (P&W Canada), Leiyong Jiang (NRC)

ISABE-2019-24029	ISABE-2019-24174	ISABE-2019-24398
Loss Determination at a Linear Cascade under Consideration of Thermal Effects	An Analytical Model for the Heat Transfer of Array Impingement	Conjugate Heat Transfer Modeling of a Turbine Vane Endwall with Thermal Barrier Coatings
Svenja Aberle-Kern, Thomas Ripplinger, Reinhard Niehuis	Zhen Zhang, Qingsong Wang, Xinrong Su and Xin Yuan	Xing Yang, Terrence W. Simon and Zhenping Feng

17.30 Technical Session MoC6: Inlets and Ducts 2 Room 6 Torrens Room

Chairs: Fredrik Wallin (GKN Aerospace), Faustin Ondore (TU Kenya)

ISABE-2019-24290	ISABE-2019-24287	ISABE-2019-24086
Optimizing Intakes for Embedded Engines	Numerical Study on the Effect of a Transonic Fan on an S Shaped Inlet	Numerical Prediction of Fan Performance Response with Inlet Distortion of Aircraft Engines
David Koo, David W. Zingg, Wajid Ali Chishty and Hamza M. abo el Ella	Weichen Zhao, Jie Chen and Guoping Huang	Ryo Kagaya, Yoshinori Ooba and Shinya Kusuda

Technical Session MoC7: Small-Scale Engines 1 Room 7 Derwent Room

Chairs: Glen Snedden (CSIR), Dries Verstraete (Sydney)

ISABE-2019-24062	ISABE-2019-24080	ISABE-2019-24126
The Numerical Aerodynamic Evaluation of Geometrical Configurations of a Vaporizer Tube Micro-Gas Turbine Combustor.	Thrust Augmentation for Very Small Jet Engines Using a Mixer-ejector System	Analysis of Influence Factors for Efficiency Improvement of The Micro Axial Turbine
Bronwyn C Meyers and Jan-Hendrik Grobler	Ralf Schmidt, Andreas Hupfer and Volker Gümmer	Deng Yang, Huang Guo-ping, Xia Chen and Xiang Xin

Tuesday 24 Sept

07.30-08.00	Registration Main Foyer
08.00-09.00	Keynote (Royal Theatre) Prof Shinji Suzuki (ICAS) <i>Emerging Technologies in Aeronautics</i>
09.00-10.00	Keynote (Royal Theatre) Dr Henrik Runnemalm (GKN) <i>Partnering the Future of Engine Systems</i>
10.00-10.30	Networking Coffee Break <i>Ballroom</i>
10.30-12.00	Morning Technical Sessions
12.00-13.00	Networking Lunch <i>Ballroom</i>
13.00-14.00	Keynote (Royal Theatre) Mr Thomas Prete (P&W) <i>F135 – The Product of Jet Engine Technical Evolution and Innovation</i>
14.00-15.00	Early Afternoon Technical Sessions
15.00-15.30	Networking Coffee Break <i>Ballroom</i>
15.30-16.30	Keynote (Royal Theatre) Mr Jim MacLeod (NRC) <i>Engine Icing Certification: Past, Present and Future</i>
16.30-18.00	Late Afternoon Technical Sessions
18.30	Bus to the Boat House <i>Deperature from the side of the NCC (by invitation only)</i>
19.00-22.00	Board Dinner for Keynotes, Boat House Restaurant (by Invitation only)
22.00	Bus back to the Crowne Plaza <i>Deperature from the Boat House (by invitation only)</i>

Tuesday 24 Sept Morning Session 10.30 - 12.00

10.30

11.00

11.30

Technical Session TuA1: Compressors 3

Room 1
Nicholls Theatre

Chairs: Nicole Key (Purdue), Peter Schiffer (TU-Darmstadt)

ISABE-2019-24102

ISABE-2019-24135

ISABE-2019-24391

3D Blade Stacking Optimization Of A 1.5-Stage Transonic Compressor Rotor

Effect of a Single Circumferential Casing Groove on the Unsteadiness of Tip Leakage Flow in a Transonic Compressor

Experimental Validation of a Mixed-flow Compressor Impeller and Cross-over Diffuser

Xiao-chen Wang, Xiao-dong Ren, Xue-song Li and Long-gang Liu

Xiaoyong Zhou, Qingjun Zhao, Wei Zhao, Qiangren Xu and Jianzhong Xu

PC Swanepoel, SJ van der Spuy, TW von Backström and GC Snedden

Technical Session TuA2 Ramjets and Scramjets 3

Room 2
Menzies Theatre

Chairs: David Buttsworth (USQ), Brad Wheatley (LMCA)

ISABE-2019-24161

ISABE-2019-24172

ISABE-2019-24175

Theoretical and Experimental Investigation on Airframe/Propulsion Integration for High-Speed Vehicles

Multi-objective Optimisation of a Turbofan for a Supersonic Transport Aircraft

Numerical Simulation of Flow through the Inlet and Isolator of a Mach 4 Dual Mode Scramjet with Geometric Modifications

Anatoly Gubanov

Dries Verstraete

Alokita Shukla, Rahul Verma, R Thundil Karuppa Raj, Senthilkumar P

Technical Session TuA3: Simulation and Modelling 2

Room 3
Swan Room

Chairs: D. R. Reddy (NASA), Leiyong Jiang (NRC)

ISABE-2019-24041

ISABE-2019-24039

ISABE-2019-24116

Corner Separation Vortex Structures Analysis of Compressor Cascade under High Mach Number Based on DES

Uncertainty and Global Sensitivity Analysis of Compressor Blade with Uncertain Inflow Conditions

Numerical Investigation on Performance Improvement of High-Speed Centrifugal Impeller Using Synthetic Jet

Ruiyu Li, Limin Gao, Lei Zhao, Chi Ma and Shiyuan Lin

Chi Ma, Limin Gao, Ming Cai and Ruiyu Li

Wenlin Huang, Zhiheng Wang and Guang Xi

Technical Session TuA4: Advanced Aircraft Concepts and Integration 1

Room 4
Murray Room

Chairs: Nicolas Tantot (Safran), Patrick Hendrick (ULB)

ISABE-2019-24264

ISABE-2019-24285

ISABE-2019-24365

Large-scale Boundary Layer Ingesting Propulsor Research

Conceptual Design of Distributed Counter-Rotating Fan Systems for Boundary Layer Ingesting Propulsion

Propulsion System Optimization for a Turboelectric Tiltwing Urban Air Mobility Aircraft

Mark L Celestina and Mary J Long-Davis

BJ Lee, May-Fun Liou and M Celestina

Eric S. Hendricks, Eliot D Aretskin-Hariton, Jeffreyes W Chapman, Justin S Gray and Robert D Falck

10.30

11.00

11.30

Technical Session TuA5: Engine Maintenance and Health Monitoring 1

Room 5
Fitzroy Room

Chairs: Richard Eustace (DST Group)

ISABE-2019-24251

ISABE-2019-24423

ISABE-2019-24421

Further Investigation On Stall Warning Approach

F414 Engine Performance Condition Monitoring and Sensor Fault Detection Using Take-off Data

Transient Vibration Analysis for Detecting Disk Cracks in Aircraft Engines

Ruize Xu, Dakun Sun, Xu Dong, Fanyu Li, Xiaofeng Sun and Tianyu Pan

Richard Eustace, Zafer Leylek, Jad Fakhry and Mike Anderson

Wenyi Wang and Marco Attia

Technical Session TuA6: Additive Manufacturing

Room 6
Torrens Room

Chairs: Anders Sjunnesson (GKN Aerospace), Lars Ellbrant (GKN Aerospace)

ISABE-2019-24028

ISABE-2019-24191

ISABE-2019-24414

Raising The Technology Level Of An Instrumented Jet Engine Compressor Vane Fabricated By Additive Manufacturing

Advanced Methods for Additive Manufacturing Demonstrated on an Instrumented Compressor Vane

Materials and Processes for New Propulsion Systems with Reduced Environmental Impact

Felix Kern, Stefan Bindl, Katharina Kreitz, Reinhard Niehuis

Stefan Bindl, Felix Kern, Reinhard Niehuis

Joseph Grady, Raymond Robinson, Gary Roberts, Sandi Miller, Michael Halbig, Michael Pereira, Chales Ruggeri and Lee Kohlman

Technical Session TuA7: Combustion and Fuels 1

Room 7
Derwent Room

Chairs: Bronwyn Meyers (CSIR), M.S. Raju (Vantage Partners)

ISABE-2019-24007

ISABE-2019-24064

ISABE-2019-24173

Preliminary Soot Computations Based on a Model Aircraft Combustor With OpenNCC

Investigation of Novel Configuration of Hydrogen Micromix Combustor for Low NOx Emission

Numerical and Experimental Analysis of the Effect of Hydrogen Injection on Flame Stabilization in Pre-cooled Turbojet Model Afterburner

Manthena S. Raju, Jeffrey P Moder and Changju T Wey

Huanrong Lei and Bhupendra Khandelwal

Yutaka Ikeda, Toshiki Okamoto, Che Zhao, Hiromu Ishikawa, Hideyuki Taguchi, Shinji Nakaya and Mitsuhiro Tsue

Tuesday 24 Sept Early Afternoon Session 14.00 - 15.00

14.00

14.30

Technical Session TuB1: Compressors 4

Room 1
Nicholls Theatre

Chairs: Peter Schiffer (TU-Darmstadt), Nicole Key (Purdue)

ISABE-2019-24148

Study on Design of Asymmetric Leading Edge of Compressor Blade

Guanhua Yang, Limin Gao, Tianyu Gao and Yu Wu

ISABE-2019-24207

Optimized Design of Rotor Fillet with Variable Radius along the Flow Direction and Its Influence on the Performance of Transonic Compressor

Xuning Zhao, Xuhui Zhou, An Yan, Yi Liu And Jiang Chen

Technical Session TuB2: Ramjets and Scramjets 4

Room 2
Menzies Theatre

Chairs: Brad Wheatley (LMCA), David Buttsworth (USQ)

ISABE-2019-24178

The Design Methodology of Osculating Waverider with Controllable Sweep Angles

Shao-hua Chen, Jun Liu, Feng Ding and Zhen Liu

ISABE-2019-24253

Hot Gas Temperature Distribution in a Gas-Generator for Air Turbo Ramjet Engine

Daisuke Nakata, Ryojiro Minato, Hiromitsu Yagihashi, Koki Arimatsu, Inaho Yoshikawa, Satoshi Inazumi, Masaya Sumiyoshi, Masaharu Uchiumi

Technical Session TuB3 Fluid and Gas Dynamics 1

Room 3
Swan Room

Chairs: Lionel Castillon (ONERA), Lars Ellbrant (GKN Aerospace),

ISABE-2019-24030

Effect of Pulsed Energy Deposition on the Mixing of Supersonic Jet Interacting with Oblique Shock

Fan Liu and Hong Yan

ISABE-2019-24081

On the Use of Exergy as a Metric for Performance Assessment of CFD Turbomachines Flows

Aurélien Arntz, Alexandre Couilleaux, David Luquet and François Julienne

Technical Session TuB4: Heat Transfer and Cooling Technologies 2

Room 4
Murray Room

Chairs: Evan Smith (RAAF)

ISABE-2019-24072

Hot-Streak Effect on Internally Air-Cooled Nozzle Guide Vanes and Shrouds

Lei-Yong Jiang, Yinghua Han, Zhong Zhang, Xija Wu, Michael Clement, and Prakash Patnaik

ISABE-2019-24340

An Experimental-numerical Method for Transient Infrared Measurement

Nicholas Holgate

14.00

14.30

Technical Session TuB5: Hybrid Engines and Integrated Systems 1

Room 5
Fitzroy Room

Chairs: Ibrahim Akmandor (Pars Makina), Smruti Sahoo (MDH)

ISABE-2019-24220

Investigation on Performance Improvement of Tesla Turbine Combined with a Cascade

Koji Okamoto, Shogo Nishimura, Susumu Teramoto and Kazuo Yamaguchi

ISABE-2019-24322

The Perspectives of "Electrochemical" Air-breathing Engines Based on Solid Oxide Fuel Cells

LS Yanovskiy, AV Baikov, IS Averkov and VV Raznosthikov

Technical Session TuB6: Materials, Structures & Failure 2

Room 6
Torrens Room

Chairs: Lars Ellbrant (GKN Aerospace), Anders Sjunnesson (GKN)

ISABE-2019-24147

Gas Turbine Mixer Modelling Strategies and Afterburner Liner Burn-Through Diagnostics

Mikael Stenfelt and Konstantinos Kyprianidis

ISABE-2019-24422

Stochastic Analysis on Low Cycle Fatigue Life of a High Pressure Turbine Nozzle Caused by the Perturbation of Turbine Inlet Temperature Distribution

Jae-Sung Huh, Yeong-Seok Kang, Dong-Ho Rhee and JaeHwan Kim

Technical Session TuB7: Inlets and Ducts 3

Room 7
Derwent Room

Chairs: Fredrik Wallin (GKN Aerospace), Olivier Petit (Chalmers)

ISABE-2019-24454

Development of a Novel Boundary Layer Ingestion Engine Intake with S-shaped Geometry

Zoitis Giakoumis, Theofilos G. Efstathiadis and Anestis I. Kalfas

ISABE-2019-24018

Parametric Design and Aero-Dynamic Analysis of Circular Variable Aero Engine Inlets for Transonic and Supersonic Civil Aviation

Stefan Kazula, Mark Wöllner, David Grasselt and Klaus Höschler

Tuesday 24 Sept Later Afternoon Session 16.30 - 18.00

16.30	17.00	17.30
Technical Session TuC1: Compressors 5 Room 1 Nicholls Theatre		
Chairs: Nicole Key (Purdue), Peter Schiffer (TU-Darmstadt)		
ISABE-2019-24241 Effect of Surface Roughness on the Boundary Layer Transition for a High Subsonic Cascade Weixiong Chen, Yangang Wang, Hao Wang and Jiawei Hu	ISABE-2019-24299 Generating Compressor Maps To Simulate Starting And Windmilling Joachim Kurzke	ISABE2019-24382 A Modelling Approach of Variable Geometry for Low Pressure Ratio Fans Mavroudis Kavvalos, Xin Zhao, Rainer Schnell, Ioanna Aslanidou, Anestis Kalfas and Konstantinos Kyprianidis
Technical Session TuC2: Ramjets and Scramjets 5 Room 2 Menzies Theatre		
Chairs: David Buttsworth (USQ), Brad Wheatley (LMCA)		
ISABE-2019-24217 Effects of Pylon Geometry on Mixing Enhancement in a Scramjet Pylon-Cavity Flameholder Aryadutt Oamjee and Rajesh Sadanandan	ISABE-2019-24429 Powered, Aerodynamic Simulations of an Airbreathing, Hypersonic Vehicle Alexander Ward and Michael Smart	ISABE-2019-24279 Combustion Instability in Dual-Mode Scramjet Combustor Camilo Aguilera, Amardip Ghosh and Kenneth H Yu
Technical Session TuC3: Simulation and Modelling 3 Room 3 Swan Room		
Chairs: Eric Hendricks (NASA), Zafer Leylek (DSTG)		
ISABE-2019-24129 Numerical Simulation Study on the Periodicity of Cascade Wind Tunnel Ming Cai, Limin Gao and Zhe Liu	ISABE-2019-24136 Development and Application of a Pre-design Tool for Aero Engine Power Gearboxes Tom Otten, Richard Becker, Stanislaus Reitenbach, Reinhold Schaber and André Engler	ISABE-2019-24146 The HBR Turbofan's Multilevel Mathematical Model as the Basis of the Engine's Digital Testing Technology Vladimir Makarov, Sergey Andreev, Vladimir Frolov and Yuri Fedorchenko
Technical Session TuC4: CENTRELINE 1 Room 4 Murray Room		
Chairs: Arne Seitz (Bauhaus Luftfahrt)		
ISABE-2019-24141 Design Trade Studies for Turbo-electric Propulsive Fuselage Integration Florian Troeltsch, Julian Bijewitz and Arne Seitz	ISABE-2019-24193 Optimisation of the Loading Structure for Propulsive Fuselage Concept Zdobyslaw Goraj, Mariusz Kowalski and Bartłomiej Goliszek	ISABE-2019-24151 Experimental Investigation of the Flow Past an Axisymmetric Body at Low Speed Biagio Della Corte, M van Sluis, A Gangoli Rao, LLM Veldhuis and L Orsini

16.30	17.00	17.30
Technical Session TuC5: New Developments in GT Engines 1 Room 5 Fitzroy Room		
Chairs: Rainer Walther (ISABE), Shaji Manipurath (NRC)		
ISABE-2019-24140 ENOVAL Low Pressure System Technologies for the next Generation of Aero Engines Joerg Sieber and Edgar Merkl	ISABE-2019-24260 An Overview of the ENOVAL Project: Definition and Analysis of Advanced Low Specific Thrust Propulsion Concepts and Technologies for Year 2025-30 Civil Aircraft John Whurr, Martin Hepperle, Fabian Donus and Nicolas Tantot	ISABE-2019-24335 Conceptual Design of Ultra-efficient Cores for Mid-century Aircraft Turbine Engines Tomas Grönstedt, Carlos Xisto, Vishal Sethi, Andrew Rolt, Nicolás García Rosa, Arne Seitz, Dimitrios Missirlis, John Whurr, Nicolas Tantot, Martin Dietz and Anders Lundblad
Technical Session TuC6: Turbines 1 Room 6 Torrens Room		
Chairs: Sami Girgis (P&W Canada), Hamza abo el Ella (NRC)		
ISABE-2019-24031 Basic Investigations for an Operation Time Determination Method of High-Pressure Turbine Components in a Twin-Spool Turbofan Engine Using CFD-Methods Stephan Scheidler and Andreas Grois	ISABE-2019-24053 Investigation of Flow Parameters Downstream the Turbine Cascade with Radial Tip Gap AD Nepomnyashchiy, VO Nigmatullin and SV Suntsov	ISABE-2019-24093 Study of the Flows in Annular S-shaped Inter-turbine Diffusers A Karpenko, O Makohon and S Riznyk
Technical Session TuC7: Small-Scale Engines 2 Room 7 Derwent Room		
Chairs: Sean O'Byrne (UNSW), Dries Verstraete (Sydney)		
ISABE-2019-24273 A Small Jet Engine Preliminary Design and its Performance Calculations Lucilene Moraes da Silva, Jesuino Takachi Tomita, Cleverson Bringhenti, Luiz Henrique Lindquist Whitacker, Luiz Eduardo Nunes Almeida and Diogo Ferraz Cavalca	ISABE-2019-24331 Optimization Based on 3D CFD Simulations of An Axial Turbine from a Small Gas Turbine Engine Luiz Gustavo Franco Amaral, Rubén Bruno Diaz, Jesuino Takachi Tomita, Cleverson Bringhenti and Izabela Batista Henriques	ISABE-2019-24387 An Overview of Small Gas Turbine Engines Fabiola Paula Costa, Luiz Henrique Lindquist Whitacker, Cleverson Bringhenti, Jesuino Takachi Tomita and Gustavo Bonolo Campos

Wednesday 25 Sept

07.30-08.00	Registration <i>Main Foyer</i>
08.00-09.00	Keynote (Royal Theatre) Dr Alex Simpson (GE Aviation) <i>Hybrid Electric Overview</i>
09.00-10.00	Keynote (Royal Theatre) CAPT Alex Passerini (Qantas) <i>Ultra-Long Haul Commercial Operations</i>
10.00-10.30	Networking Coffee Break <i>Ballroom</i>
10.30-12.00	Morning Technical Sessions
12.00-13.00	Networking Lunch
13.00-14.00	Keynote (Royal Theatre) MZ Siddique (GTRE) <i>Aero Engine Development in India - Achievements and Opportunities</i>
	ISABE Technical Tours <ul style="list-style-type: none"> Tidbinbilla Nature Reserve and NASA CDSCC Departs 13.00 by bus (~5 hours) UNSW Canberra Research Labs Departs 14.00 by bus (~3 hours) Australian Transportation Safety Bureau Departs 14.00 by foot (~1 hour) Airservices Australia Network Coordination Centre Departs 14.00 by foot (~0.5 hour) Australian War Memorial Aircraft Collection Depart by foot (open till 17.00)
19.00-21.00	AIAA Networking Dinner for Students and Keynotes, Novotel (by Invitation only)



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Morning Session 10.30 - 12.00

10.30	11.00	11.30
Technical Session WeA1: Compressors 6 Room 1 Nicholls Theatre		
Chairs: Stéphane Burguburu (Safran), Rainer Schnell (DLR)		
ISABE-2019-24440 Aerodynamic Design and Application of a Mixed-flow Compressor with High Hub-Tip Ratio Hang Xiang, Jiang Chen, Jinxin Cheng, Xiancheng Song, Han Niu and Yi Liu	ISABE-2019-24017 Design and Performance of a Low Fan-Pressure-Ratio Propulsion System Rainer Schnell, Erik Goldhahn and Marc Julian	ISABE-2019-24368 The Potential of Casing Treatments for Transonic Compressors: Evaluation Based on Axial-Slot and Rotor Blade Optimization Georgios Goinis, Christian Voß and Eberhard Nicke
Technical Session WeA2: Heat Transfer and Cooling Technology 3 Room 2 Menzies Theatre		
Chairs: Evan Smith (RAAF), D. R. Reddy (NASA)		
ISABE-2019-24246 Off-Design Engine Simulation using Different Cooling Predicting Models Janaina Ferreira da Silva, Ana Adalgiza Garcia Maia, Cleverson Bringhenti and Jesuino Takachi Tomita	ISABE-2019-24255 A Pragmatic Method for Matching Conjugate Heat Transfer Predictions with Experiments Jonathan Hilgert, Heinz-Peter Schiffer and Timm Janetzke	ISABE-2019-24341 Parallel Rotation for Negating Coriolis Force Effect on Heat Transfer Ajay Sarja, Prashant Singh and Srinath V. Ekkad
Technical Session WeA3: Simulation and Modelling 4 Room 3 Swan Room		
Chairs: Eric Hendricks (NASA), Zafer Leylek (DST Group)		
ISABE-2019-24196 Time Domain Implementation of a Spectral Non-reflecting Boundary Condition for Unsteady Turbomachinery Flows Daniel Schluß and Christian Frey	ISABE-2019-24336 Multi-Objective Optimisation of Semi-Closed Cycle Engines for High Altitude UAV Propulsion Jacopo Tacconi, Wilfried PJ Visser and Dries Verstraete	ISABE-2019-24357 Optimization of Adaptive Cycle Engine Cycle Parameters Based on Kriging Model Zhang Xiaobo, Ye Yifan and Wang Zhanxue
Technical Session WeA4: CENTRELINE 2 Room 4 Murray Room		
Chairs: Arne Seitz (Bauhaus Luftfahrt)		
ISABE-2019-24162 Aerodynamics of Boundary Layer Ingesting Fuselage Fans Alejandro Castillo Pardo and Cesare A Hall	ISABE-2019-24215 Adaption of a Turbofan Engine for High Power Offtakes for a Turbo-electric Propulsive Fuselage Concept Sebastian Samuelsson, Olivier Petit, Rasmus Merkle and Guido Wortmann	ISABE-2019-24087 Integration Aspects for Large Generators into Turbofan Engines for a Turbo-electric Propulsive Fuselage Concept Rasmus Merkle, Sebastian Samuelsson and Guido Wortmann

Wednesday 25 Sept Morning Session 10.30 - 12.00

10.30	11.00	11.30
Technical Session WeA5: New Developments in GT Engines 2 Room 5 Fitzroy Room		
Chairs: Pericles Pilidis (Cranfield), Rainer Walther (ISABE)		
ISABE-2019-24411 Multi Stream Turbofan Engine with Built in Regenerative Heat Exchanger Mohamed Hussein Ahmed, Essam Eldin Khalil, Gamal El Hariry, Eslam Said Abdelghany and Ahmed El Saleh	ISABE-2019-24002 Concept of Prototype of Near-Term Supersonic Commercial Aircraft with Derivative Engines Based on Existing Cores Vladimir Korovkin, Alexander Evstigneev, Vladimir Makarov, Dmitry Strelets, Oleg Shevelev, Viktor Kopiev and Ivan Belyaev	ISABE-2019-24044 Key Technologies for the Next Generation of Civil Aircraft Engines Frank Haselbach
Technical Session WeA6: Secondary Flows 1 Room 6 Torrens Room		
Chairs: Faustin Ondore (TU Kenya), Susan Michaelis (University of Stirling)		
ISABE-2019-24005 Experimental Characterization of Air-oil Two-phase Flows and Air-oil Separator Performance in Advanced Aero-engines Mariano Di Matteo, Olivier Berten, Patrick Hendrick and Benjamin Fulleringer	ISABE-2019-24212 Physico-mathematical Model of Oil Chamber in Bearing Support of GTE Rotor OS Gurevich, AI Gulienko and YM Shchurovsky	ISABE-2019-24410 Effect of Design Parameters on Oil-jet Gear Interaction - A CFD Study Marc C Keller, Christian Kromer, Laura Cordes, Corina Schwitzke and Hans-Jörg Bauer
Technical Session WeA7: Combustion and Fuels 2 Room 7 Derwent Room		
Chairs: Yolanda Hicks (NASA), Sean O'Byrne (UNSW Canberra)		
ISABE-2019-24238 Experience in Designing of Pneumatic Atomizer and Jet Front Module for LPP Combustion of Liquid Fuels VI Furlotov, A Yu Vasilyev, VF Goltsev, AI Mayorova, AA Sviridenkov and OV Zubkova	ISABE-2019-24256 Bio-fuel for Aviation: Brazilian Prospects Adalton Ribeiro Martuscelli, Cleverson Bringhenti, Gustavo Bonolo de Campus, Jesuino Takachi Tomita, Rubén Bruno Diaz	ISABE-2019-24404 Combustion and Emissions Study using a 7-point Lean Direct Injector Array Yolanda R Hicks, Tyler G Capil, Kathleen M Tacina and Robert C Anderson

Thursday 26 Sept

07.30 - 08.00	Registration <i>Main Foyer</i>
08.00 - 09.00	Keynote (Royal Theatre) Dr. Jörg Sieber (MTU) <i>MTU's Technology Roadmap Towards Emission Free Flying</i>
09.00 - 10.00	Keynote (Royal Theatre) Dr Kevin Bowcutt (Boeing) <i>Flying at the Edge of Space and Beyond: The Opportunities and Challenges of Hypersonic Flight</i>
10.00 - 10.30	Networking Coffee Break <i>Ballroom</i>
10.30 - 12.00	Morning Technical Sessions
12.00 - 13.00	Networking Lunch <i>Ballroom</i>
13.00 - 14.00	Keynote (Royal Theatre) AVM Catherine Roberts (RAAF) <i>The Challenge of Distance for Australia's Airpower – Partnering with Industry and Academia on Advanced Propulsion Technology Solutions</i>
14.00 - 15.00	Early Afternoon Technical Sessions
15.00 - 15.30	Networking Coffee Break <i>Ballroom</i>
15.30 - 16.30	Keynote (Royal Theatre) Prof Michael Smart (UQ) <i>SPARTAN: small satellite delivery using scramjets</i>
16.30 - 17.30	Late Afternoon Technical Sessions
17.30	Buses to the National Arboretum <i>Deperature from the side of the NCC</i>
18.00 - 22.30	ISABE Gala Banquet, National Arboretum
21.45 - 22.30	Shuttle Buses back to the Crowne Plaza <i>Deperature from the front of the National Arboretum</i>

Thursday 26 Sept Morning Session 10.30 - 12.00

10.30	11.00	11.30
Technical Session ThA1: Fluid and Gas Dynamics 2 Room 1 Nicholls Theatre		
Chairs: Lars Ellbrant (GKN Aerospace), Lionel Castillon (ONERA)		
ISABE-2019-24188	ISABE-2019-24451	ISABE-2019-24195
Aerodynamic Ground Effect in Ducted Fan UAV Take-off and Landing	Spatio-Temporal Behaviour of a Cylinder Wake in Mach 3 Flow	Supersonic Flows Over A 3-Dimensional Bump With Injection
Shuanghou Deng, Siwei Wang, Jun Wang and Hongming Cai	Sean McCreton, Manuj Awasthi, Con Doolan, Danielle Moreau	Jintu K James and Heuy Dong Kim
Technical Session ThA2: Ramjets and Scramjets 6 Room 2 Menzies Theatre		
Chairs: Kevin Bowcutt (Boeing), Michael Smart (UQ)		
ISABE-2019-24059	ISABE-2019-24106	ISABE-2019-24095
Impact of Aeroelasticity on Hypersonic Intake Performance	Fluid-Thermal-Structure Interactions on a Hypersonic Two-Dimensional Intake	Analysis of a Modified Scramjet Intake for a Low Speed Flight Test Program of a Hypersonic Waverider
Sudip Bhattra, Andrew J Neely, Gaetano MD Currao and Liam P McQuellin	Gaetano MD Currao, Sudip Bhattra and Andrew J Neely	Tamás Bykerk, Dries Verstraete, Victor Villace, Sebastian Wolf and Johan Steelant
Technical Session ThA3: Simulation and Modelling 5 Room 3 Swan Room		
Chairs: D. R. Reddy (NASA), Zafer Leyelek (DST Group)		
ISABE-2019-24377	ISABE-2019-24234	ISABE-2019-24441
Machine-Learning Based Predictive Analytics for Aircraft Engine Conceptual Design	The High Level of Maturity of the elsA CFD Software for Turbomachinery Aerodynamics Applications	Introduction and Validation of a Mean Line Solver for Present and Future Turbomachines
Michael T Tong	Sylvie Plot	Nicolai Neumann and Dieter Peitsch
Technical Session ThA4: Seals and Bearings 1 Room 4 Murray Room		
Chairs: Glen Sneddon (CSIR)		
ISABE-2019-24043	ISABE-2019-24083	ISABE-2019-24305
Bearing Chamber Sealing and the Use of Aircraft Bleed Air	Aerospace Sealing Technology for Maintenance, Repair and Overhaul of Engines: a Review	Development and Testing of GTE Rotor Suspension with Active and Passive Magnetic Bearings
Susan Michaelis	Sarah Shabbir, Seamus Garvey and Sam M Dakka	OS Gurevich, AI Gulienko, VV Kotunov and AV Livanov

10.30	11.00	11.30
Technical Session ThA5: Small-Scale Engines 3 Room 5 Fitzroy Room		
Chairs: Bronwyn Meyers (CSIR), Dries Verstraete (Sydney)		
ISABE-2019-24390	ISABE-2019-24236	
Small Aeroengine Turbine Numerical and Experimental Investigation	Details of Semi-empirical Method for Computation of Combustors of Small-size GTE	
S Riznyk, S Boris, P Varvaruk and A Karpenko	Roman S Medvedev, Alexander Yu Vasilyev and Anna I Maiorova	
Technical Session ThA6: VSTOL and Thrust Vectoring 2 Room 6 Torrens Room		
Chairs: Suresh Sampath (Cranfield), Hamza abo el Ella (NRC)		
ISABE-2019-24186	ISABE-2019-24316	ISABE-2019-24187
Study on the Side Force Prediction in Shock Vector Control	Fluidic Thrust Vectoring Control on an Air-breathing Hypersonic Vehicle	Effect of Fluidic Thrust Vectoring on Engine Performance
KX Wu, SK Raman, VRP Sethuraman and Heuy Dong Kim	Shi Jing-wei, Wang Wen-jie, Wang Zhan-xue and Zhou Li	T Chandra Sekar, Kundan Jaiswal, Ramraj H Sundararaj, Rajat Arora and Abhijit Kushari
Technical Session ThA7: Diagnostics, Test and Development Room 7 Derwent Room		
Chairs: Sean O'Byrne (UNSW Canberra), Yolanda Hicks (NASA)		
ISABE-2019-24317	ISABE-2019-24325	ISABE-2019-24122
Temperature And Soot Volume Fractions Measurements Using Picture Reverse-Reconstruction Method	Leveraging LDV Techniques for the Investigation of Unsteady Turbomachinery Flows	Automation of Stuttgart University's Multi-Functional Altitude Test Facility
Victor Chernov	WJ Gooding, NL Key	Constanze Schiewe, Stephan Staudacher and Marvin Elter

Thursday 26 Sept Early Afternoon Session 14.00 - 15.00

14.00

14.30

Technical Session ThB1: Turbines 2

Room 1
Nicholls Theatre

Chairs: Sami Girgis (PGW Canada), Reinhard Niehuis (Bundeswehr University)

ISABE-2019-24105

Investigation of the Flowfield on a Vaneless Counter-rotating Turbine with Seal Cavity Flow Ejection

Xiuming Sui, Wei Zhao, Qingjun Zhao, Meng Xu and Jianzhong Xu

ISABE-2019-24345

Conceptual Mean-line Design of a Low Pressure Turbine for a Geared Turbofan with Rear Structure Interaction

Xin Zhao, Sebastian Samuelsson, Tomas Grönstedt, Visakha Raja, Ola Isaksson and Anders Lundblad

Technical Session ThB2: Ramjets and Scramjets 7

Room 2
Menzies Theatre

Chairs: Michael Smart (UQ), Kevin Bowcutt (Boeing)

ISABE-2019-24369

Performance Design Optimization of RBCC Combustor in Ramjet and Scramjet Operation via Surrogate-Based Evolutionary Algorithms

Michael Candon, Peter Driscoll, Joseph Salloum, Hideaki Ogawa and Masatoshi Kodera

ISABE-2019-24424

TUSQ Wind Tunnel for Supersonic Engine Testing

Fabian Zander, Byrenn Birch and David R Buttsworth

Technical Session ThB3: Engine Emissions 2

Room 3
Swan Room

Chairs: Raquel Salmeron (Airservices), Victor Chernov (ORT)

ISABE-2019-24308

Influence Of Atmospheric Conditions On Contrails Formation: 3D Simulation Versus Schmidt-Appleman Criterion

W. Ghedhaifi, A. Biener, R. Megherbi, E. Montreuil, E. Terrenoire, X. Vancassel and A. Loseille

ISABE-2019-24329

Modeling Capabilities on the Formation of Contrails in a Commercial CFD Code

Sébastien Cantin, François Morency and François Garnier

Technical Session ThB4: Materials, Structures and Failure 3

Room 4
Murray Room

Chairs: Joe Grady (NASA), Evan Smith (RAAF)

ISABE-2019-24433

Ice Crystal Icing Wind Tunnel at USQ: Initial Characterisation

R I Saeed, Kh Saleh and D Buttsworth

ISABE-2019-24016

Feasibility of Light Weight Composite Fan Outlet Guide Vanes for Large Turbofan Engines

Anders Sjunnesson, Dennis Rikemanson and Robert Reimers

14.00

14.30

Technical Session ThB5: Small-Scale Engines 4

Room 5
Fitzroy Room

Chairs: Dries Verstraete (Sydney), Bronwyn Meyers (CSIR)

ISABE-2019-24380

Biofuels Combustion Assessment on Small Gas Turbines

Ramon E. P. Silva, Fabiola Paula Costa, Pedro T. Lacava

ISABE-2019-24125

Complete Engine CFD of a Micro Gas Turbine for Various Shaft Speeds by Modelling Combustion as a Heat Source

Johan Kotzé and Glen Snedden

Technical Session ThB6: Flutter and Vibration 1

Room 6
Torrens Room

Chairs: Jennifer Blackburne (U Stuttgart), Gaetano Currao (UNSW Canberra)

ISABE-2019-24117

Blade Vibrations Caused By Tip Clearance Flow In A Centrifugal Impeller

Yurun Li, Zhiheng Wang and Guang Xi

ISABE-2019-24137

Research on Performance of an Axial Compressor Fan Rotor Considering Fluid-Structure Interaction Effect

Ning Ge, Limin Gao, Lei Zhao, Shuai Zhang and Tianlong Zheng

Technical Session ThB7: Combustion and Fuels 3

Room 7
Derwent Room

Chairs: M.S. Raju (Vantage Partners), Sean O'Byrne (UNSW Canberra)

ISABE-2019-24342

Comparison of RANS and Hybrid RANS-LES Models for Flow Field Under Non-reacting Conditions in a Swirl-stabilized Can Combustor

Shoaib Ahmed, Prashant Singh and Srinath V Ekkad

ISABE-2019-24330

Spray Combustion Analysis in a Lean Direct Injection Combustor using the Flamelet-Progress Variable Approach

Jong-Chan Kim, Kyobin Lee and Hong-Gye Sung



NASA is exploring new technologies to make today's aircraft quieter and more efficient, to get you from gate-to-gate safely and on time, while working to transform aviation into a new economic engine at all altitudes.

We foresee a paradigm shift in commercial aviation, and across NASA, our aeronautics researchers are developing transformative and disruptive technologies in aerodynamics, air-breathing propulsion, power, unmanned aircraft systems, communications and materials to lead us into that future. We are preparing for the next era of NASA experimental aircraft with the all-electric X-57 Maxwell and X-59 QueSST, NASA's low-boom supersonic demonstrator.

NASA's Glenn Research Center in Cleveland, Ohio, has a long history of advancing aviation research, and we are advancing technologies critical to the development of new, highly-integrated aircraft and systems concepts for the future. These emerging systems will significantly reduce the cost, energy consumption, noise and emissions, while opening up new markets and opportunities for industry. We are committed to investigating the use of alternative energy sources for commercial and general aviation.

We believe we're at the right place, at the right time, with the right technology, and we want to lead the aviation industry into a renaissance. The dynamic partnerships, infrastructure and capabilities we are building right now will enable future generations to continue shaping our next aerospace frontier.

Welcome to the 24th ISABE Conference. We look forward to engaging with you for any near-, mid- and far-term solutions to current and future aviation challenges.

Janet L. Kavandi, Ph.D.
Center Director
NASA's John H. Glenn Research Center

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Thursday 26 Sept

Late Afternoon Session 16.30 - 17.30

16.30

17.00

Technical Session ThC1: Turbines 3

Room 1
Nicholls Theatre

Chairs: Reinhard Niehuis (Bundeswehr University), Sami Girgis (P&WC)

ISABE-2019-24021

ISABE-2019-24396

Advance2 - Rolls-Royce Technology for the New Pearl Jet Engine Family

Numerical Study of Combustor-turbine Interactions Considering a Two-stage High-pressure Turbine

Ulrich Wenger

Kenji Miki, Thomas Wey and Jeffrey Moder

Technical Session ThC2: Heat Transfer and Cooling 4

Room 2
Menzies Theatre

Chairs: Nicole Key (Purdue), D. R. Reddy (NASA)

ISABE-2019-24269

ISABE-2019-24319

A Pressure Sensitive Paint Study of Transpiration Cooling Efficiency of Porous Materials

Numerical Investigation of Film Cooling Effects under Transient Inflow

Kivanc Yildiz, Mathieu Hinse, Patrick Richer, Bertrand Jodoin, Sean Yun, Hamza Abo el ella and Zekai Hong

F Bakhtiari and H-P Schiffer

Technical Session ThC3: Nozzles 2

Room 3
Swan Room

Chairs: Olivier Petit (Chalmers)

ISABE-2019-24047

ISABE-2019-24209

A Numerical Model for Predicting the Aerodynamic Characteristics of Propelling Nozzles

Computational Study of Planar Double Divergent Nozzles for Reduction of Side Load and Flow Asymmetry

Aws Al-Akam, Theoklis Nikolaidis, David G. MacManus and Devaiah Nalianda

Prasanth P Nair, Johny George, Abhilash Suryan, Abhay Mohan and Heuy Dong Kim

Technical Session ThC4: Secondary Flows 2

Room 4
Murray Room

Chairs: Faustin Ondore (TU Kenya)

ISABE-2019-24268

ISABE-2019-24435

Numerical Investigations on the Rubbing Process in Labyrinth Seals for Full Flight Mission

Modeling and Potentials of Flexible Secondary Air Systems Regarding Mission Fuel Burn Reduction and Blade Creep Life

Oliver Munz, Lisa Hühn, Fabian Bleier and Hans-Jörg Bauer

Dominik Woelki and Dieter Peitsch

Technical Session ThC5: Noise 1

Room 5
Fitzroy Room

Chairs: Richard Sandberg (Melbourne)

ISABE-2019-24261

ISABE-2019-24289

Concept Development and Evaluation for a Broadband Noise Absorbing Acoustic Liner Concept for Aviation

Rotor/Stator Interaction Noise and Aerodynamic Performance of Fan with Swept-Back Stators and Different Stator Count

Paul König, Marcel Mischke, Michael Pohl, Stefan Kazula and Klaus Höschler

Genki Omagari, Nobuhiko Yamasaki and Yuzo Inokuchi

16.30

17.00

Technical Session ThC6: Flutter and Vibration 2

Room 6
Torrens Room

Chairs: Gaetano Currao (UNSW Canberra), Jennifer Blackburne (U Stuttgart)

ISABE-2019-24265

ISABE-2019-24324

Reducing Resonant Low Engine Order (LEO) Blade Vibrations by Means of Tip Injection - a Study of the Underlying Mechanisms

A fully Coupled FSI Approach for Flutter and Forced Response Prediction

Jennifer Blackburne, Damian M. Vogt and Stephan Netzhammer

Senad Iseni, Derek Micallef and Francesca di Mare

Technical Session ThC7: Hybrid Engines and Integrated Systems 2

Room 7
Derwent Room

Chairs: Rainer Walther (ISABE), Mavroudis Kavvalos (MDH)

ISABE-2019-24459

ISABE-2019-24166

Off-design Performance Analysis of Hybridized Aircraft Gas Turbine

Electrical Power Recovery from Gas Turbines Exhaust Waste Heat

Xin Zhao, Smruti Sahoo, Konstantinos Kyprianidis, Jonatan Rantzer and Michael Sielemann

Ibrahim Sinan Akmandor and Melih Okur



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NRC Capabilities

- Combustion and spray testing
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- Engine and probe altitude testing
- Icing research, probe development and certification
- Mechanical component testing

CONTACT

Eric Lefebvre, Aerospace Business Advisor
+1 613-949-7548 • Eric.Lefebvre@nrc-cnrc.gc.ca
canada.ca/nrc-aerospace



Friday 27 Sept

07.30-08.00	Registration <i>Main Foyer</i>
08.00-09.00	Keynote (Royal Theatre) Dr. Xiaofeng Sun (Beihang) <i>A Theoretical Framework for the Study of Fan/Compressor Flow Stability</i>
09.00-10.00	Keynote (Royal Theatre) Dr Raquel Salmeron (Airservices) <i>Australian Airspace 2025</i>
10.00-10.30	Networking Coffee Break <i>Ballroom</i>
10.30-12.00	Morning Technical Sessions
12.00-13.00	Networking Lunch <i>Ballroom</i>
13.00-14.30	ISABE Discussion Panel (Royal Theatre) <i>Disrupting Distance With Advanced Technologies</i>
14.30-15.30	Conference Closing (Royal Theatre)
15.30-16.00	Networking Coffee Break <i>Ballroom</i>



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Morning Session 10.30 - 12.00

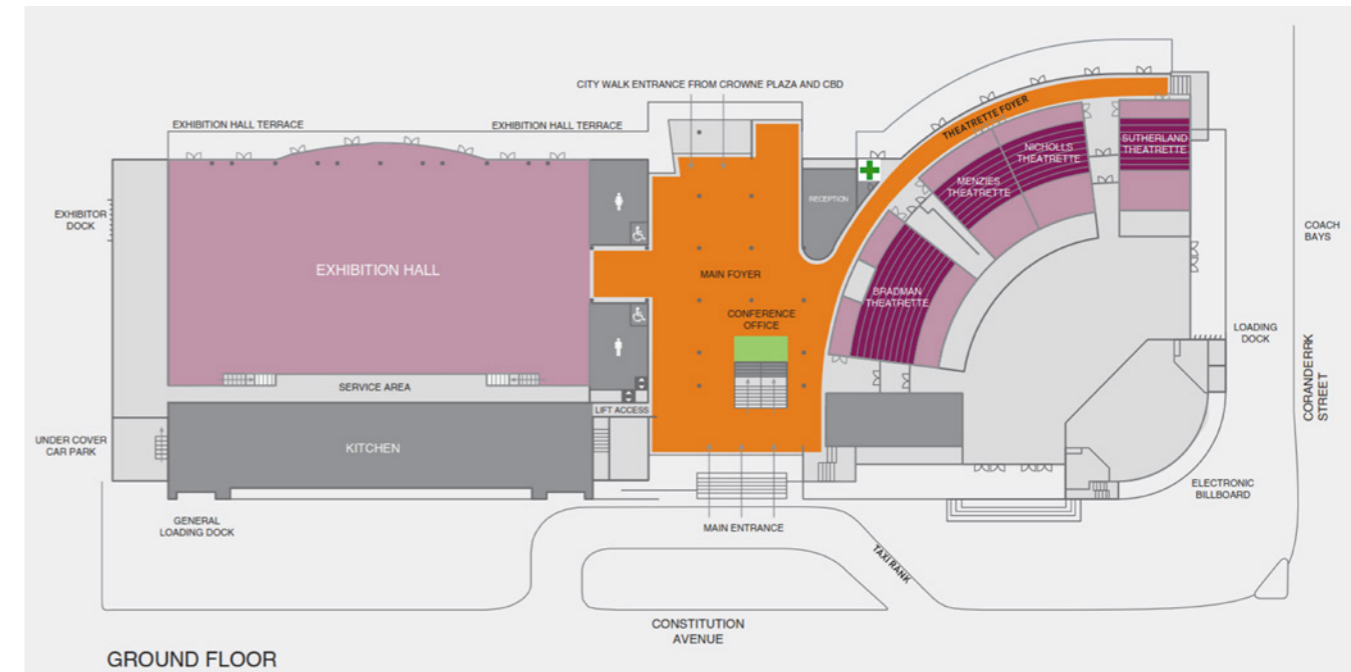
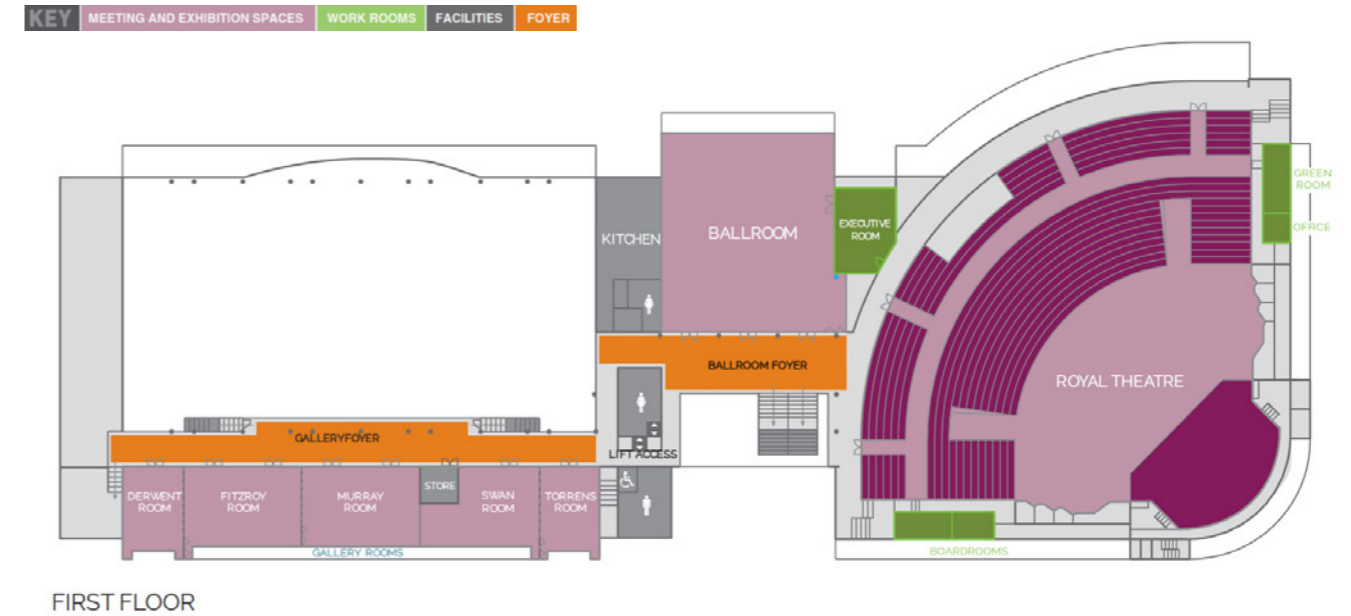
10.30	11.00	11.30
Technical Session FrA1: Combustion and Fuels 4 Room 1 Nicholls Theatre		
Chairs: M.S. Raju (Vantage Partners), Bronwyn Meyers (CSIR)		
ISABE-2019-24078 Effect of Dimensions and Pressure Drop on Discharge Coefficient of Duplex Fuel Nozzle Hu Bin, Deng Ai-Ming, Xiang Xiao-Rong, Wang Zhong-Hao and Zhao Qing-jun	ISABE-2019-24338 Effects of chemical reaction mechanism and NOx formation pathways on an inter-turbine burner A. A. V. Perpignan and A. Gangoli Rao	ISABE-2019-24420 Spray Characteristics of Jet in Crossflow Using Radial Swirler by Injector Hole Position Myeong Hwan Choi, Dongsoo Shin, Joungwan Lee and Jaye Koo
Technical Session FrA2: New Developments in GT Engines 3 Room 2 Menzies Theatre		
Chairs: Pericles Pilidis (Cranfield), Ibrahim Akmandor (Pars Makina)		
ISABE-2019-24356 Coupling a Waste Heat Recovery Turbine to an Axial Compressor Boost Stage Ibrahim Sinan Akmandor and Munir ElFarra	ISABE-2019-24354 A Hybrid Overwing Geared Dual-Fan: Dual Bypass Turbofan Engine Design Concept Faustin Ondore	ISABE-2019-24180 Test Of Gas-Driven Ducted Fan And Analysis Of Its Core Components - Low Solidity And Small Deflection Angle Tip-Turbine Yu Zhang, Chen Xia, Jun Li, Xin Xiang and Guo Ping Huang
Technical Session FrA3: Seals and Bearings 2 Room 3 Swan Room		
Chairs: Sarah Shabbir (Nottingham), Sean O'Byrne (UNSW Canberra)		
ISABE-2019-24096 Effect of Upstream Deflector Plate on the Leakage Flow and Heat Transfer Characteristics of Brush Seal with Annular Groove in Backing Plate Yuanqiao Zhang, Jun Li, Zhigang Li, Liming Song and Xin Yan	ISABE-2019-24097 Numerical Investigations on the Sealing Effectiveness of Rim Seal and Heat Transfer Characteristics in Wheel Space Cavity of Turbine Stage Shuxian Cheng, Jun Li, Zhigang Li and Liming Song	
Technical Session FrA4: Advanced Aircraft Concepts 2 Room 4 Murray Room		
Chairs: Patrick Hendrick (ULB), Dries Verstraete (Sydney)		
ISABE-2019-24463 Electrical Propulsive Fuselage Concept for Transonic Transport Aircraft Ralph H Jansen, Mark L Celestina and Hyun D Kim	ISABE-2019-24240 Aerodynamic Influence of Airframe Boundary Layer on Propeller Performance Olivier Petit, Fabiola Costa, Jesuino Takachi Tomita and Cleverson Bringhenti	ISABE-2019-24258 Design Conditions for an Aft Mounted Fan with Boundary Layer Ingestion Hans Martensson, Lars Ellbrant and Anders Lundblad



Friday 27 Sept Morning Session 10.30 - 12.00

10.30	11.00	11.30
Technical Session FrA5: Engine Integration and Noise Room 5 Fitzroy Room		
Chairs: Richard Sandberg (U Melbourne)		
ISABE-2019-24443	ISABE-2019-24386	ISABE-2019-24351
Acoustics Considerations for Propulsion Airframe Integration	Open Rotor Engines for Short/Medium Range Aircraft	An A Priori Analysis of DNS Data for LES of Sound Generation by Turbulent Premixed Flames
Dale Van Zante and David M. Elliott	Mario Lambey, Nicolas Tantot, Anthony Binder and Arnaud LeBrun	Pavel Panek, Davy Brouzet, Mohsen Talei, Robert L. Gordon and Michael J. Brear
Technical Session FrA6: Engine Technology Room 6 Torrens Room		
Chairs: Suresh Sampath (Cranfield), Anestis Kalfas (AUT)		
ISABE2019-24214	ISABE-2019-24419	ISABE-2019-24352
Conceptual Design of a Hybrid Gas Turbine – Solid Oxide Fuel Cell System for Civil Aviation	Assessment of Degradation Equivalent Operating Time for Aircraft Gas Turbine Engines	A Novel Air-Fuel Heat Exchanger Design for Aero-Engines and Air-Side Heat Transfer Experimental Validation
Andromachi Papagianni, Anestis Kalfas, Ioanna Aslanidou and Konstantinos Kyprianidis	Alozie Ogechukwu, Yi-Guang Li, Michail Diakostefanis, Xin Wu, Xingchao Shong, Wencheng Ren	Junjie Wei, Jie Wen, Yanchen Fu, Guoqiang Xu
Technical Session FrA7: Simulation and Modelling 6 Room 7 Derwent Room		
Chairs: Zafer Leylek (DSTG), Jesuino Takachi Tomita (ITA Brazil)		
ISABE-2019-24040	ISABE2019-24197	ISABE-2019-24138
From Interdisciplinary Propulsion System Parameter Studies to Initial Module Design – an Integrated Conceptual Design	Low-Order Models for the Calculation of Compressor Sub-idle Characteristics	Temperature Dynamic Model of Turbine Subcomponents for Turbine Tip Clearance Implementation in an Engine Performance Model
Reinhold Schaber, Christina Salpingidou, Hermann Klingels	Mauro Righi	Javier Ruiz and Antoine Ferrand

Venue Map National Convention Centre Canberra



Registration Foyer	Conference Opening & Closing Royal Theatre	Keynotes and Discussion Panel Royal Theatre	Technical Sessions Menzies, Nicholls, Derwent, Fitzroy, Murray, Swann, Torrens	Networking Breaks & Lunch Ballroom	Speaker Preparation Boardroom 1

Speaker Instructions

Please follow the instructions below when preparing and presenting your presentations for ISABE 2019

- 30-min speaking session have been assigned to all speakers (excluding Keynotes). Please keep your presentation to 15 – 20 min. The remaining time will be for a short Q&A and presenter changeover, and audience room change.
- Presenters will be given a 5min, 3min and 1min warnings when approaching 20min total speaking time. Speaking time will be strictly monitored to maintain scheduling across the parallel sessions.
- If using slides, the preferred format is 16:9, however, 6:4 is also supported.
- You are to bring your slides to the speaker preparation room no later than the morning of your presentation. Slides will then be uploaded to the conference computer.
- Please report to your scheduled room 5 – 10 minutes before your session start and introduce yourself to your session chair.
- All rooms will be provided with a laser pointer.

Note:
If you are travelling with a dependent and as primary carer you need support for child care during ISABE2019, please contact the Conference Secretary (Dr Bianca Capra b.capra@adfa.edu.au) to arrange assistance.



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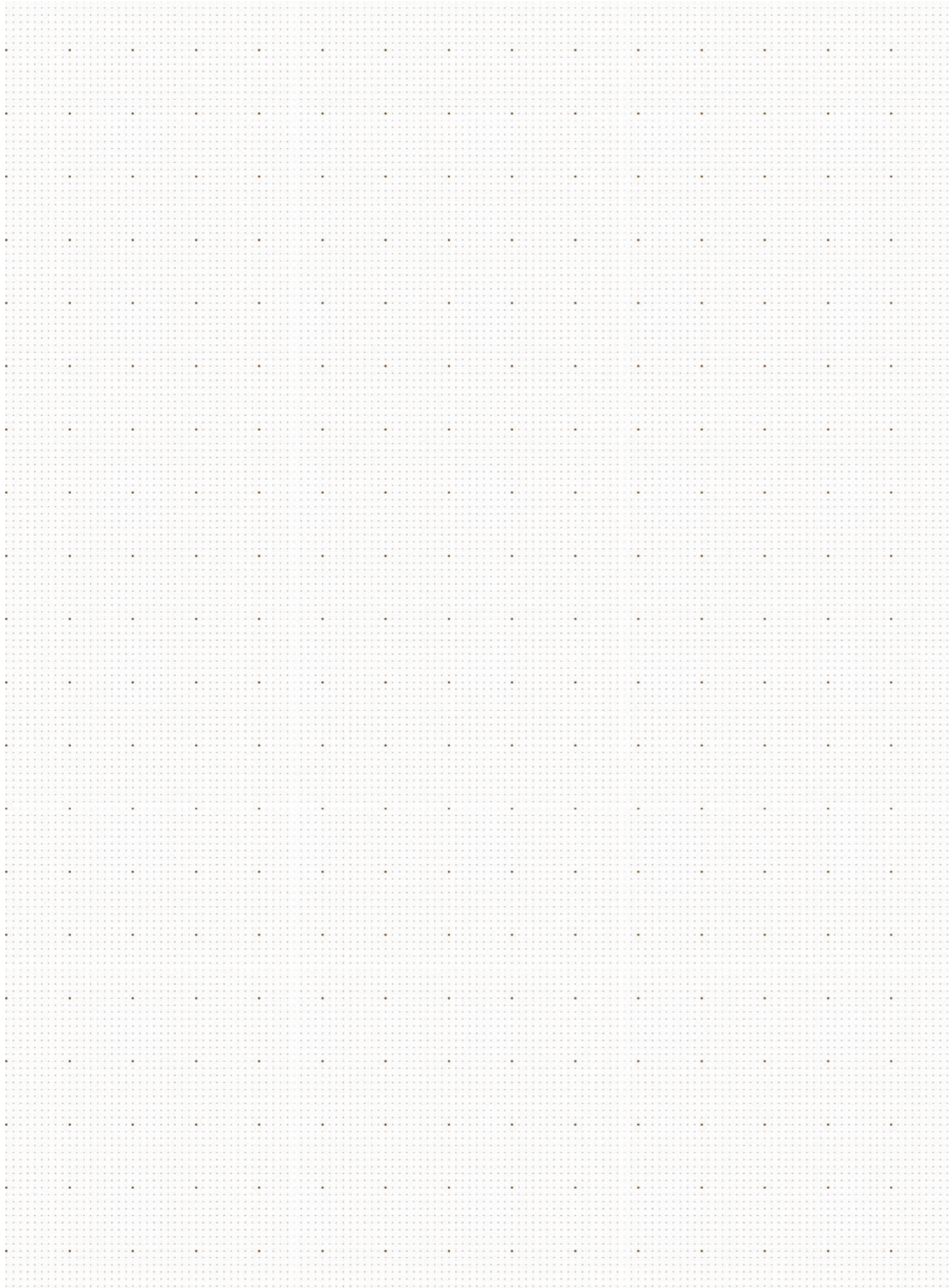


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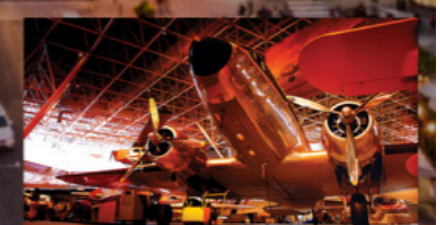
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