



# PROVISIONAL PROGRAM

PROPULSION TECHNOLOGIES FOR A **GREENER FUTURE**

## ISABE 2022

25<sup>th</sup> ISABE Conference

25-30 September 2022  
Ottawa, Canada



Local Organizer



National Research  
Council Canada

Conseil national de  
recherches Canada





# TABLE OF CONTENTS

<u>WELCOME TO OTTAWA, CANADA</u>	<b>3</b>
<u>LIST OF SPONSORS</u>	<b>4</b>
<u>COMMITTEE</u>	<b>5</b>
<u>CONFERENCE SCHEDULE</u>	<b>6</b>
<u>CONFERENCE DETAILS</u>	<b>8</b>
<u>SOCIAL EVENTS</u>	<b>9</b>
<u>ACCOMPANYING PERSONS PROGRAM</u>	<b>10</b>
<u>VENUE MAP</u>	<b>11</b>
<u>DISTINGUISHED KEYNOTE SPEAKERS</u>	<b>14</b>
<u>SPEAKER INSTRUCTIONS</u>	<b>15</b>
<u>LIST OF PAPERS</u>	<b>16</b>



# WELCOME TO OTTAWA, CANADA

As the ISABE Vice-President, it is my privilege to welcome you to Ottawa, Canada for ISABE 2022 on its special golden jubilee anniversary. As a proud supporter of ISABE since its formation fifty years ago, my organization, the National Research Council of Canada, would like to extend a special welcome to all delegates of ISABE 2022.

With the 5<sup>th</sup> largest Aerospace industry, Canada is an Aerospace nation. The Canadian Aerospace industry is well diversified in the Civil, Defence and Space sectors, generates over \$31 billion in revenue each year, and employs 215,000 highly qualified professionals in every region of the country. Canadians are immensely proud of their aerospace heritage from the Avro Arrow, to the Canadarm. Canada is also a major player in the gas turbine segment, being home to the world's #1 manufacturer of turboprop and turboshaft engines, Pratt & Whitney Canada. Given our climate, Canada can also claim to be the engine icing certification capital of the world.

As Canada's Capital city, Ottawa is a hub for the Aerospace, Defence and Security sectors. Seven of the world's top ten Aerospace and Defence companies have their Canadian headquarters in Ottawa and it is home to Canada's armed forces, aerospace regulators, and the testing facilities of the National Research Council of Canada.

At ISABE 2022, it is my hope that you will have productive technical discussions, as well as plenty of opportunities to reconnect with old friends and make new acquaintances—all adding up to an enriching and memorable time.

During your stay with us, please take a moment to explore the City of Ottawa and its surrounding areas. With museums, galleries and landmarks like the Rideau Canal (a UNESCO World Heritage site) or the historic Byward Market within walking distance, you will have plenty to choose from. At the same time, you are never far from nature. You may also just be in time to treat yourself to our brilliant fall colours—a classic Canadian scenery at the nearby Gatineau Park.

Once again, we are delighted to welcome you to Ottawa for the 25<sup>th</sup> ISABE conference, and invite you to experience the best that the city has to offer during your stay.



**DR. IBRAHIM YIMER**  
*Ibrahim Yimer*  
ISABE Vice-President  
Director-General, Aerospace,  
National Research Council  
of Canada



# LIST OF SPONSORS

## PLATINUM



## GOLD



## SILVER



## BRONZE



## PARTNERS



# COMMITTEE



## ISABE COMMITTEE

### PROF. RICHARD J PARKER

PRESIDENT ISABE  
Special Adviser, Rolls Royce plc

### DR. IBRAHIM YIMER

VICE PRESIDENT ISABE  
2019-2021  
NRC, Canada

### PROF. RAINER WALTHER

ADMINISTRATIVE SECRETARY

### PROF. GLEN SNEDDEN

TREASURER  
University of KwaZulu-Natal,  
South Africa

### MR. ROBERT PROCTER

EXECUTIVE SECRETARY  
Rolls-Royce, Indianapolis, US

### DR. SURESH SAMPATH

COMMUNICATIONS DIRECTOR  
Cranfield University, UK

## CANADIAN NATIONAL ORGANIZING COMMITTEE

### DR. IBRAHIM YIMER

Chair, CANNOC  
NRC-CNRC

### MR. SHAJI MANIPURATH

Vice Chair, CANNOC  
NRC-CNRC

### DR. HAMZA ABO EL ELLA

NRC-CNRC

### MR. PHIL COLE

Marinvent

### MS. NATASHA GAGNON

Ontario Aerospace Council

### DR. SAMI GIRGIS

P&W Canada

### MR. GEORGE HAJECEK

MDS Aero Support

### DR. ZEKAI HONG

NRC-CNRC

### MR. SYLVAIN LAROCHELLE

P&W Canada

### MR. JIM MACLEOD

NRC-CNRC

### PROF. HANY MOUSTAPHA

ETS

### MS. CARMEN PATRY

NRC-CNRC

### MR. VLAD PRYSTAIKO

NRC-CNRC

### PROF. DAVID RANCOURT

Universite de Sherbrooke

### PROF. HENRY SAARI

Carleton University

### DR. SEAN YUN

NRC-CNRC



# CONFERENCE SCHEDULE

<b>SUNDAY</b> <b>SEPTEMBER 25, 2022</b>	<b>MONDAY</b> <b>SEPTEMBER 26, 2022</b>	<b>TUESDAY</b> <b>SEPTEMBER 27, 2022</b>
	<b>7:30-9:00</b> Registration & Breakfast	<b>7:30-8:00</b> Registration & Breakfast
	<b>9:00-10:00</b> Opening Ceremony (Rm 206-208)	<b>8:00-10:00</b> Plenary Session 2-1 (Rm 206-208)
	<b>10:00-12:00</b> Plenary Session 1-1 (Rm 206-208)	<b>10:00-10:30</b> Break
	<b>12:00-13:00</b> Lunch (Ottawa Salon)	<b>10:30-12:00</b> Technical Session 2-1
	<b>13:00-14:00</b> Plenary Session 1-2 (Rm 206-208)	<b>12:00-13:00</b> Lunch (Ottawa Salon)
	<b>14:00-15:00</b> Technical Session 1-1	<b>13:00-14:00</b> Plenary Session 2-2 (Rm 206-208)
	<b>15:00-15:30</b> Coffee Break	<b>14:00-15:00</b> Technical Session 2-2
<b>15:00-17:00</b> Registration (Rideau Canal Atrium)	<b>15:30-16:30</b> Plenary Session 1-3 (Rm 206-208)	<b>15:00-15:30</b> Coffee Break
	<b>16:30-17:30</b> Technical Session 1-2	<b>15:30-16:30</b> Plenary Session 2-3 (Rm 206-208)
<b>17:00-18:00</b> Welcome Reception (Rideau Canal Atrium)		<b>16:30-17:30</b> Technical Session 2-3
	<b>19:00-20:30</b> Industry Dinner (Canadian Aviation and Space Museum)	<b>19:00-20:30</b> ISABE Board & Invited Speakers Dinner (by invitation only) (Westin Ottawa – TwentyTwo)



<b>WEDNESDAY</b> <b>SEPTEMBER 28, 2022</b>	<b>THURSDAY</b> <b>SEPTEMBER 29, 2022</b>	<b>FRIDAY</b> <b>SEPTEMBER 30, 2022</b>
<b>7:30-8:00</b> Registration & Breakfast	<b>7:30-8:00</b> Registration & Breakfast	<b>7:30-8:00</b> Registration & Breakfast
<b>8:00-9:00</b> Plenary Session 3-1 (Rm 206-208)	<b>8:00-10:00</b> Plenary Session 4-1 (Rm 206-208)	<b>8:00-10:00</b> Plenary Session 5-1 (Rm 206-208)
<b>9:00-17:30</b> Technical Tours	<b>10:00-10:30</b> Break	<b>10:00-10:30</b> Break
	<b>10:30-12:00</b> Technical Session 4-1	<b>10:30-12:00</b> Technical Session 5-1
	<b>12:00-13:00</b> Lunch (Ottawa Salon)	<b>12:00-13:00</b> Lunch (Ottawa Salon)
	<b>13:00-14:00</b> Plenary Session 4-2 (Rm 206-208)	<b>13:00-14:00</b> Plenary Session 5-2 (Rm 206-208)
	<b>14:00-15:00</b> Technical Session 4-2	<b>14:00-15:00</b> Technical Session 5-2
	<b>15:00-15:30</b> Coffee Break	<b>15:00-15:30</b> Closing Ceremony (Rm 206-208)
	<b>15:30-16:30</b> Plenary Session 4-3 (Rm 206-208)	<b>15:30-16:00</b> Farewell Coffee
	<b>16:30-17:30</b> Technical Session 4-3	
	<b>19:00-20:30</b> ISABE Gala Banquet and Awards Ceremony (Shaw Centre–Trillium Ballroom)	



# CONFERENCE DETAILS

## CONFERENCE LOCATION

The 25<sup>th</sup> ISABE Conference will be held at the Shaw Centre in the middle of Ottawa's commercial heart. Ottawa is Canada's capital city. The city centre is well connected to Ottawa International Airport, about 20 minutes by bus or 15 minutes by taxi. Ottawa has direct international flights to many cities.

COVID-19 Entry to Canada Advisories:

**[Find out more about Covid-19 requirement for Canada](#)**

Find out more about the Conference Venue at: [www.shaw-centre.com](http://www.shaw-centre.com) and [www.ottawatourism.ca](http://www.ottawatourism.ca)







# SOCIAL EVENTS

## INDUSTRY DINNER

Monday, September 28<sup>th</sup>, 2022

### Canadian Aviation and Space Museum

Stunning elegance amid a world-renowned aerospace collection.

- Open to all conference registrants
- Canadian aviation history
- 8 km from downtown Ottawa, buses will be provided from the Shaw Centre



## INVITED SPEAKERS DINNER

Tuesday, September 27<sup>th</sup>, 2022

### Westin Hotel–TwentyTwo

- By Invitation only (Board Members, Invited Speakers and Award Recipients, and their Accompanying Partners)
- **TwentyTwo at The Westin Ottawa | An experience above all**

Update photo



## ISABE GALA BANQUET

Thursday, September 29<sup>th</sup>, 2022

### Shaw Centre–Trillium Ballroom

This bright open space provides stunning views of the historic Rideau Canal and a 200 degree view of downtown Ottawa.

- Open to all conference registrants
- Reception and Formal Dinner
- ISABE Awards Presentation





# ACCOMPANYING PERSONS PROGRAM

Those who are accompanying delegates to ISABE 2022 can register for the Accompanying Persons Program. The program features excursions in and around the Ottawa area, as well as tours at some of the main cultural and social sites. Registration as an accompanying person also includes access to the welcome reception, the industry dinner and the closing banquet dinner. Those accompanying board members or keynote speakers are in addition invited the board dinner.

The program itinerary is summarized below:

## **Sunday (25 Sep 2022):**

**Evening:** Welcome reception at the [\*\*Shaw Centre\*\*](#).

## **Monday (26 Sep 2022):**

**Late Morning/Early Afternoon:** Welcome Meet & Greet and [\*\*Ottawa River Cruise\*\*](#).

**Evening:** Industry dinner at the [\*\*Canadian Aviation & Space Museum\*\*](#).

## **Tuesday (27 Sep 2022):**

**Late Morning/Early Afternoon:** Byward Market Guided [\*\*Food Tour\*\*](#).

**Evening:** At leisure to experience central Ottawa's wide range of eateries.

Those accompanying board members or keynote speaker are invited to dinner at [\*\*Twenty-Two Restaurant\*\*](#).

## **Wednesday (28 Sep 2022):**

**Late Morning/Early Afternoon:** Excursion to 1000 Islands, including [\*\*boat cruise and lunch\*\*](#).

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

## **Thursday (29 Sep 2022):**

**Morning:** A visit to the [\*\*National Gallery of Canada\*\*](#).

**Afternoon:** At leisure to explore Ottawa.

**Evening:** Closing banquet dinner at the [\*\*Shaw Centre\*\*](#).

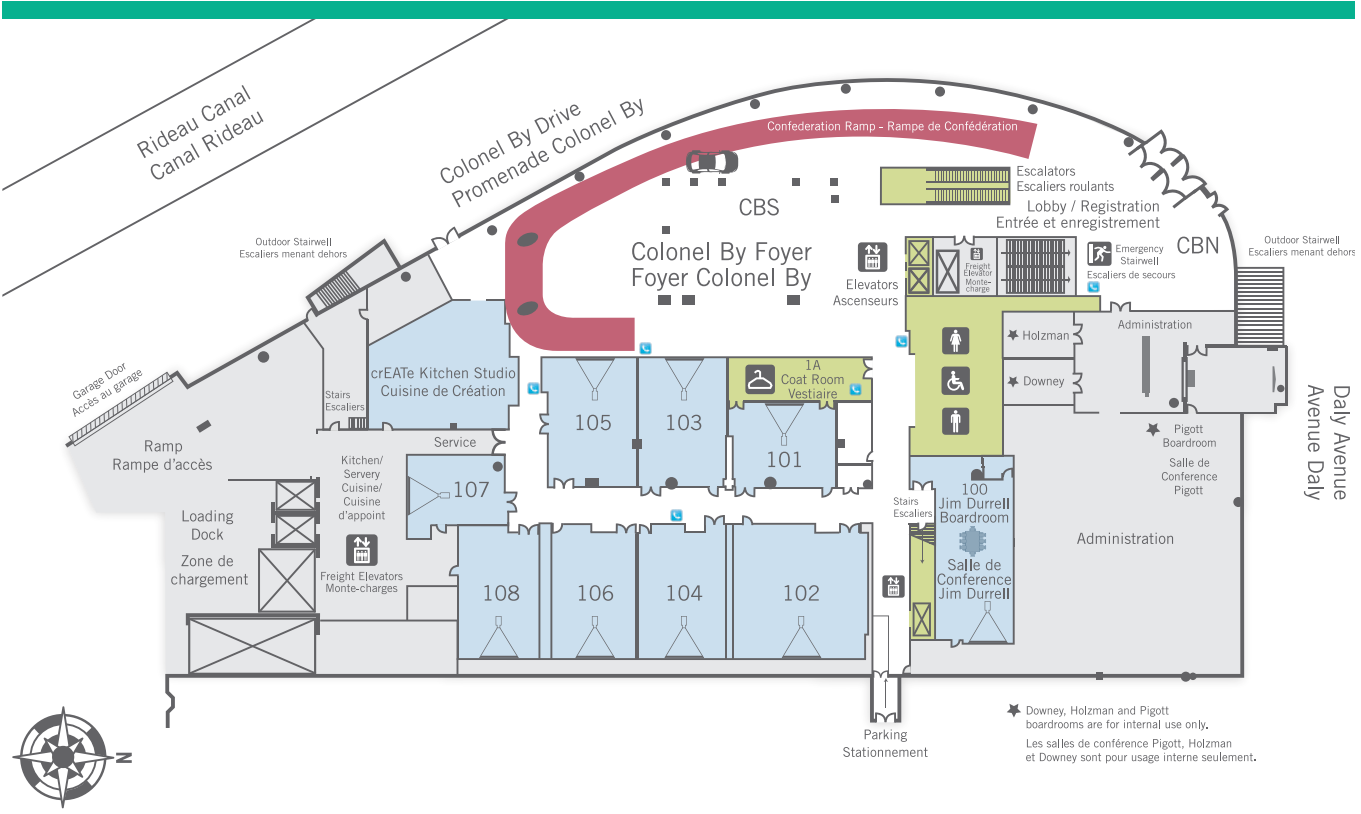
**Registration is now open!**  
**Register [here](#).**



# **VENUE MAP**

## SHAW CENTRE

### LEVEL 1



# SHAW CENTRE

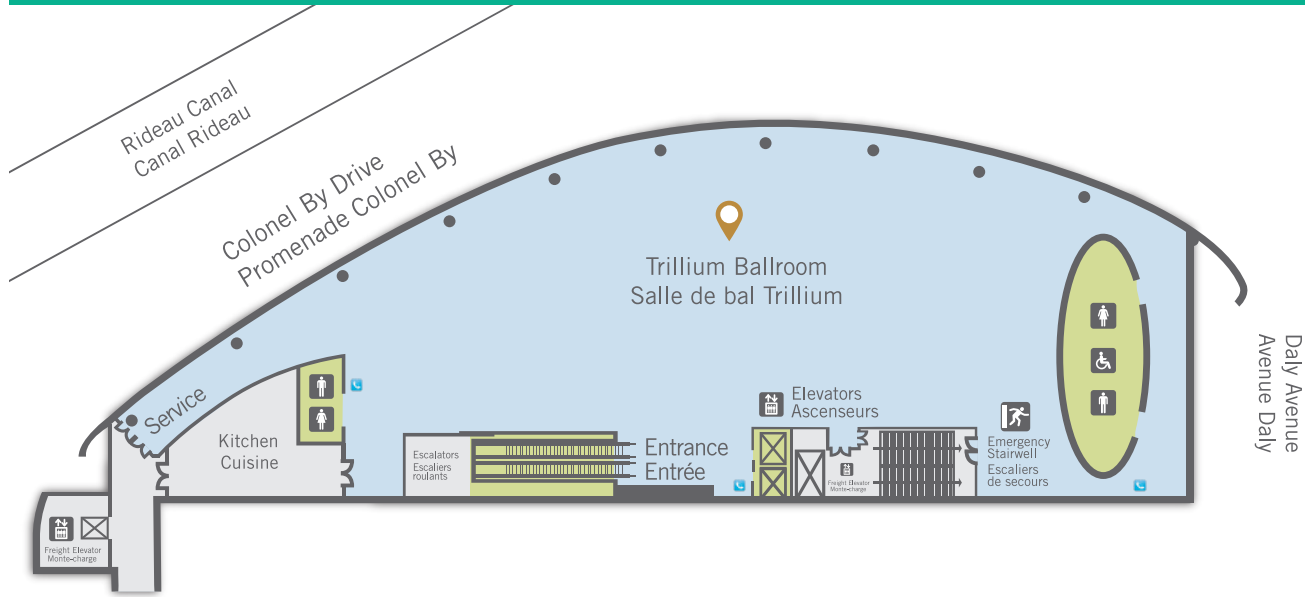
## LEVEL 2




- 📍 **Board meeting:** Room 210
- 📍 **Registration & Opening Reception (Sunday, September 25):** Rideau Canal Atrium
- 📍 **Meeting and Exhibiting Space:** Room 201
- 📍 **Lunch:** Ottawa Salon
- 📍 **Break rooms for technical paper presentation:** Rooms 202, 204, 209, 210, 211, 212
- 📍 **Coffee break:** Rideau Canal South
- 📍 **Keynotes:** Rooms 206 and 208

# SHAW CENTRE

## LEVEL 4



 **Banquet:** Trillium Ballroom





# DISTINGUISHED KEYNOTE SPEAKERS



**DR. JEAN THOMASSIN**

Executive Director,  
New Products  
and Services  
Introduction

**PRATT & WHITNEY  
CANADA**



**DR. STEFAN WEBER**

Senior Vice  
President,  
Engineering  
and Technology

**MTU AERO  
ENGINES**



**DR. JAMES KENYON**

Acting Director,  
Glenn Research  
Center

**NASA**



**DR. STÉPHANE ORCEL**

Vice President,  
Product Strategy  
& Market

**SAFRAN  
AIRCRAFT  
ENGINES**



**MR. JOHN JASTREMSKI**

President and Chief  
Executive Officer

**MDS AERO**



**DR. ADAM DISSEL**

President

**REACTION  
ENGINES**



**DR. JOAO LUIZ F. AZEVEDO**

President, Executive  
Committee

**INTERNATIONAL  
COUNCIL OF THE  
AERONAUTICAL  
SCIENCES**



**DR. JEAN-FRANÇOIS BROUCKAERT**

Head of  
Technology Office

**CLEAN  
AVIATION JOINT  
UNDERTAKING**



**DR. FRANK HASELBACH**

Head of Propulsion  
Engineering

**AIRBUS**



**DR. FASSI KAFYEKE**

Senior Director,  
Strategic  
Technology  
and Innovation

**BOMBARDIER**



**PROF. PERICLES PILIDIS**

Professor, Centre  
for Propulsion  
Engineering

**CRANFIELD  
UNIVERSITY**



**DR. ARNE SEITZ**

Deputy Head  
of Visionary  
Aircraft Concepts

**BAUHAUS  
LUFTFAHRT**



**DR. GUENTER WILFERT**

Director, Operation and  
Technology Management  
Aviation Advanced Technology

**GE AVIATION**

**AND MORE...**



# SPEAKER INSTRUCTIONS

Please follow the instructions below when preparing and presenting your presentations for ISABE 2022

- 30-min speaking sessions 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 period, presenter changeover, and audience room change.
- Presenters will be given a 5 min, 3 min and 1 min warnings when approaching 20 min 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, 4:3 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.

If you have any questions, please contact us at [NRC.ISABE2022-SIMA2022.CNRC@nrc-cnrc.gc.ca](mailto:NRC.ISABE2022-SIMA2022.CNRC@nrc-cnrc.gc.ca)

# LIST OF PAPERS

TITLE	AUTHOR NAME	OTHER AUTHORS
<p>ISABE 2021 001</p> <p><b>Propulsion System Integration for a First Generation Hydrogen Civil Airliner?</b></p>	Devaiah Nalianda	Jon Huete / Pericles Pilidis / Devaiah Nalianda
<p>ISABE 2021 003</p> <p><b>Electrical propulsion for Fuselage Boundary Layer Ingestion airframe concept – Dual supply synchronization</b></p>	Kingsley Ibrahim	Kingsley Ibrahim / Suresh Sampath / Devaiah Nalianda
<p>ISABE 2021 006</p> <p><b>A hybrid LES/FW-H simulation for the fan/compressor trailing-edge broadband noise reduction with serrated configuration</b></p>	Weiyang Qiao	Fan Tong / Kangshen Xiang / Luqin Mao / Hang Tong / Weijie Chen
<p>ISABE 2021 007</p> <p><b>Infrared signal of the lobed mixer with external air mixing</b></p>	Seong Man Choi	H.S. Jang / H.H. Park
<p>ISABE 2021 009</p> <p><b>Receipt ceramic material based on aluminium oxide using sol-gel technology</b></p>	Buriachek Oleg	Zhuravel Vladimir
<p>ISABE 2021 012</p> <p><b>A Review of Technologies for the Adjustment of the Leading-Edge of Variable Pitot Inlets for SST</b></p>	Stefan Kazula	Klaus Höschler
<p>ISABE 2021 013</p> <p><b>Numerical Investigation of the Breakup Mode and Trajectory of Liquid Jet in a Gaseous Crossflow at Elevated Conditions</b></p>	Yu Zhu	Vishal Sethi / Xiaoxiao Sun



TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 019 <b>A Method for Two-Phase Flow Simulation in Engine Performance Tools</b>	Martin Obermueller	Dieter Peitsch / Arne Weckend / Holger Schulte
ISABE 2021 020 <b>A study on the possibility of the application of hybrid propulsion system architectures for military air vehicles</b>	Stephan G. Scheidler	Moritz G. Kolb
ISABE 2021 021 <b>Numerical Study of CombustorTurbine Interactions Considering a TwoStage High-Pressure Turbin</b>	Kenji Miki	Thomas Wey / Jeffrey Moder
ISABE 2021 022 <b>Rotation and curvature correction for SST turbulence model applied on the prediction of pressure losses through air-oil centrifugal separators for modern aero-engines</b>	Mariano Di Matteo	Olivier Berten / Patrick Hendrick
ISABE 2021 028 <b>Potential of Surrogate Modeling in Compressor Casing Design Focusing Rapid Tip Clearance Assessments</b>	Tobias Schmidt	Marco Konle / Volker Gümmer
ISABE 2021 032 <b>Experimental investigation on the influence of the trailing edge shape in a film cooled transonic high pressure turbine cascade</b>	Ines Gohl	Martin Bitter / Dragan Kozulovic / Hiroki Sato / Reinhard Niehuis
ISABE 2021 034 <b>Development of a TRL 3 Concept for Variable Pitot Inlets for SST Using a Safe Design Approach</b>	Stefan Kazula	Klaus Höschler

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 036 <b>Experimental and numerical investigation of mixer ejector nozzles for very small turbojet engines</b>	Ralf Schmidt	Andreas Hupfer / Volker Gümmer
ISABE 2021 041 <b>Reflection on the Pitch-Chord and Meanline Radius Ratios in Design and Performance of Centrifugal Turbines</b>	Liu Yu	Yu Min Liu / Patrick Hendrick / Zheng Ping Zou / Frank Buyschaert
ISABE 2021 042 <b>On the Effect of Inter Compressor Duct Length on Compressor Performance</b>	Thomas Dygutsch	Aaron Kasper / Christian Voss
ISABE 2021 045 <b>Design of sub-scale fan for a boundary layer ingestion test with by-pass</b>	Hans Martensson	Marcus Lejon / Debarshee Ghosh / Mikael Åkerberg / Faezeh Rasimarzabadi / Martin Neuteboom
ISABE 2021 046 <b>Conception and Assessment of Test Rig for Characterisation of Air-oil Heat Exchangers in Oil Systems for Aero Engines</b>	Joëlle Vincké	Olivier Berten / Patrick Hendrick
ISABE 2021 050 <b>Experimental Study on Efficiency Enhancement of Tesla Turbine by Cascade Addition</b>	Koji Okamoto	Jumpei Nakamura / Kazuo Yamaguchi / Susumu Teramoto
ISABE 2021 060 <b>Aeroengine transient performance simulation integrated with generic heat soakage and tip clearance model</b>	Yiguang Li	Zhuojun Li / Suresh Sampath
ISABE 2021 061 <b>Performance characteristics of miniature gas turbine with a pulse combustor</b>	Takashi Sakurai	Shunsuke Nakamura / Takehiro Sekiguchi / Sora Inoue

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 062 <b>Assessment of the Fluid Network for the Effusion Holes in a RQL (Rich-burn, Quickquenched, Lean-burn) Gas Turbine Combustor</b>	Changju Thomas Wey	N/A
ISABE 2021 066 <b>Flame Structure Comparison using Jet-A and an isoparaffinic fuel in a lean direct injection flame tube combustor</b>	Yolanda Hicks	Kathleen M. Tacina / Tyler G. Capil
ISABE 2021 067 <b>The Effect of Combustor Inlet Swirl on the Performance of a Micro Gas Turbine</b>	Sybrand Johannes van der Spuy	L.J. Ferreira
ISABE 2021 071 <b>Interactive Learning Platform for Axial Compressor Preliminary Design</b>	George Patton de Oliveira Silva	Igor de Oliveira / Cleverson Bringhenti / Jesuino Takachi Tomita
ISABE 2021 078 <b>Numerical Study on the Effect of Impinging Shocks on Film Cooling Effectiveness in a Dual Bell Nozzle</b>	Abhilash Suryan	Akhil Sivadas / Martin Raju / Lijo Vincent / Heuy Dong Kim
ISABE 2021 080 <b>Experimental investigation of the oil jet heat transfer on a rotating cylinder for an aero engine gearbox</b>	Christian Kromer	Christian Kromer / Emre Ayan / Corina Schwitzke/ Hans-Jörg Bauer
ISABE 2021 083 <b>Numerical Investigations on the Effect of Blade Tip Winglet on Leakage Flow Loss Reduction for a Zero Inlet Swirl Turbine Rotor</b>	Qinghui Zhou	Wei Zhao / Qingjun Zhao / Xiuming Sui / Jianzhong Xu
ISABE 2021 085 <b>Investigation on shock-induced separation loss mitigation method considering radial equilibrium in a transonic compressor rotor</b>	Yongzhen Liu	Qingjun Zhao / Wei Zhao / Qiang Zhou / Jianzhong Xu

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 090 <b>On the EBC Phase Determination</b>	Li Li	Michael G. Glavicic / Stephanie Gong / Kelly Kranjc
ISABE 2021 093 <b>Jet Engines Performance Accounting</b>	Javier Ruiz-Domingo	N/A
ISABE 2021 094 <b>Turbofan Transient Heat Transfer Analysis</b>	Javier Ruiz-Domingo	Farid Benyoucef
ISABE 2021 097 <b>Redesign of a Micro Turbine for Sub-400N Thrust Class Engines</b>	Glen Snedden	N/A
ISABE 2021 100 <b>Multi-Domain Conjugate Heat Transfer (CHT) Analysis Using General Grid Interface (GGI)</b>	Farzad Ashrafi	Sri Sreekanth
ISABE 2021 103 <b>Testing a Ceramic Matrix Composite Regenerative Heat Exchanger in a Supersonic Combustor</b>	Inyoung Yang	Kyung-jae Lee / Yang-ji Lee / Sang-hun Lee / Se-young Kim
ISABE 2021 108 <b>An Alternative Approach to Evaluate Fuel / Air Mixing Quality</b>	Lei-Yong Jiang	N/A
ISABE 2021 113 <b>Numerical Analysis of the Influence of Near-Endwall Camber Line Distribution on Leakage Losses of Axial Compressor Shrouded Stators</b>	Ilaria De Dominicis	Antonija Simunovic / Sebastian Robens / Volker Gümmer
ISABE 2021 116 <b>Enhanced Modeling of Turbulent Decay in Steady State Mixing Plane Simulations</b>	Alexander Führung	Nemo Juchmann / Dragan Kožulović/ Christoph Bode / Stephan Behre / Peter Jeschke

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 117 <b>A Mathematical Study of Rotor Thermal Bow in Gas Turbines</b>	Evan Oscar Smith	Kaisar Al Shami / Andrew Neely
ISABE 2021 127 <b>Unsteady Simulations of Migration and Deposition of Fly-Ash Particles in the First-Stage Turbine of an Aero-Engine</b>	Zhenping Feng	Zihan Hao / Xing Yang
ISABE 2021 128 <b>Effects of alternating elliptical chamber on jet impingement heat transfer in gas turbine leading edge at different cross flow velocity ratio</b>	Zhenping Feng	Kun Xiao
ISABE 2021 129 <b>Combustion Analysis of Strut based Flame Stabilizer for Scramjet Combustor with Dummy Struts</b>	Abhilash Suryan	Prasanth P. Nair / Vinod Narayanan
ISABE 2021 130 <b>Towards Quantitative Wall Shear Stress Measurements: Considering the Flow Behavior of Liquid Crystals</b>	Stefanos Melekidis	Stefanos Melekidis / Marcus Ebert / Jonas Schmid / Hans-Jörg Bauer
ISABE 2021 141 <b>Experimental Study of Active Flow Control Effectiveness in an Advanced S-Shaped Engine Intake by using an Ejector-Pump</b>	Philipp Max	Michael Krummenauer / Marcel Stöbel / Reinhard Niehuis / Dragan Kozulovic
ISABE 2021 142 <b>Effect of Fuels, Aromatics and Preparation Methods on Seal-Swell</b>	Bhupendra Khandelwal	Vamsi Krishna Undavalli

TITLE	AUTHOR NAME	OTHER AUTHORS
<p>ISABE 2021 143</p> <p><b>Multi-platform app-embedded model for hybrid air-breathing rocket-cycle engine in hypersonic atmospheric ascent</b></p>	<p>Spyros Tsentis</p>	<p>Spyros Tsentis / Vasilis Gkoutzamanis / Aggelos Gaitanis / Anestis Kalfas</p>
<p>ISABE 2021 144</p> <p><b>Design and development of a variable area nozzle for a test rig for fanintake interaction</b></p>	<p>Patrick Brunow</p>	<p>Jonas Grubert / Jens Friedrichs / Jens Ortmanns</p>
<p>ISABE 2021 145</p> <p><b>Aerodynamic Installation Effects of Over-the-wing Mounted Ultra-highbypass Engines</b></p>	<p>Vinicius Tavares Silva</p>	<p>Anders Lundbladh / Carlos Xisto</p>
<p>ISABE 2021 151</p> <p><b>Conceptual Gas Turbine Design: The Role of Turbine Maps</b></p>	<p>Joachim Kurzke</p>	<p>N/A</p>
<p>ISABE 2021 152</p> <p><b>A quantum mechanical study to determine the thermo-chemistry of the jet engine exhaust gases in order to suppress contrails</b></p>	<p>Sarah Qureshi</p>	<p>Rumana Qureshi</p>
<p>ISABE 2021 157</p> <p><b>Modelling Degradation Mechanisms in Hybrid-Electric Aircraft Propulsion Systems</b></p>	<p>Maximilian Bien</p>	<p>Maximilian Bien / Jan Göing / Jens Friedrichs /Karl Ziaja / Francesca di Mare / Norman Blanken / Yongtao Cao / Axel Mertens / Bernd Ponick / Lukas Schuchard / Matthias Voigt / Ronald Mailach</p>
<p>ISABE 2021 160</p> <p><b>The Numerical Aerodynamic Investigation of Swirling Inlet flow in a Vaporizer Tube Micro-Gas Turbine Combustor</b></p>	<p>Bronwyn C. Meyers</p>	<p>Bronwyn. C. Meyers / Jan-Hendrik Grobler / Glen. C. Snedden</p>
<p>ISABE 2021 167</p> <p><b>Interaction of combined module variances and influence on the overall performance of an turbofan engine</b></p>	<p>Jan Goeing</p>	<p>Lars Hinz / Sebastian Lueck / Max Bien / Jens Friedrichs</p>

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 170 <b>Experimental investigation on the effect of downstream casing coolant injection on loss in linear turbine cascade with tip clearance</b>	Dunam Hong	Seung Jin Song
ISABE 2021 174 <b>Organic Rankine Cycle for Turboprop Engine Application</b>	Theofilos Efstathiadis	Georgios Pateropoulos / Theofilos Efstathiadis / Anestis Kalfas
ISABE 2021 178 <b>Experimental Study on Ethanol Combustion Efficiency in a Laboratorial-scale Gas Turbine Combustor</b>	Ramon Eduardo Pereira Silva	Leila Ribeiro dos Santos / Pedro Teixeira Lacava
ISABE 2021 180 <b>Sustainable Product Development in Aeroengine manufacturing Challenges, Opportunities and Experiences from GKN Aerospace Engines</b>	Ola Isaksson	Ola Isaksson / Sophie I. Hallstedt / Johanna W. Nylander / Petter Andersson / Sören Knuts
ISABE 2021 181 <b>Impact of Tank Gravimetric Efficiency on Propulsion System Integration for a First Generation Hydrogen Civil Airliner</b>	Devaiah Nalianda	Jon Huete / Pericles Pildis
ISABE 2021 182 <b>Effects of a Squealer-Winglet geometry on the aerodynamic performance of a Hydraulic Axial Turbine used in turbopumps</b>	Daniel da Silva Tonon	Jesuino Takachi Tomita / Ezio Castejon Garcia / Cleverson Bringhenti / Luiz Eduardo Nunes Almeida
ISABE 2021 187 <b>Spray Combustion Analysis on a Kerosene Fueled Multi-Phase Real Combustor</b>	Jong-Chan Kim	Hong-Gye Sung

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2021 190 <b>Estimation of performance of turbofan engine bay ventilation and cooling system</b>	Aishwarjya Gogoi	Rohit Vashistha / Himanshu Yadav
ISABE 2021 193 <b>Improvements in a Multistage Axial-Flow Compressor Design and its Operation on a Small Gas Turbine Performance</b>	Ruben Bruno Diaz	Jesuino Takachi Tomita / Cleverson Bringhenti / Diogo Ferraz Cavalca
ISABE 2021 195 <b>Design and Development of an engine inlet distortion measurement</b>	Aishwarjya Gogoi	Rohit Vashistha
ISABE 2021 196 <b>Feasibility study of engine bay ventilation with intake air driven by ejector nozzle</b>	Aishwarjya Gogoi	Abhijit Dhamanekar
ISABE 2021 197 <b>Sensitivity study of engine design parameters on climate change</b>	F. Yin	H.S. Saluja / A. Gangoli Rao
ISABE 2021 199 <b>The Effect of Aerodynamic Lifting Surfaces on an Aft-Fuselage BLI Propulsor</b>	Arvind Gangoli Rao	Emily Raijmakers / Biagio Della Corte / Arvind Gangoli Rao
ISABE 2022 202 <b>Multidisciplinary Conceptual Design for a Hybrid-Electric Commuter Aircraft</b>	Christos P. Nasoulis	Vasilis G. Gkoutzamanis / Anestis I. Kalfas
ISABE 2022 203 <b>Experimental investigation of the oil jet heat transfer on meshing spur gears</b>	Emre Ayan	Christian Kromer / Corina Schwitzke / Hans-Jörg Bauer
ISABE 2022 205 <b>Tensile and Fatigue Performance in Tension-Tension of Additively Manufactured Composite Materials for Engine Applications</b>	Julieta Barroeta Robles	Priti Wanjara / Richard G. Cole / Fabian Sanchez / Andrew Spineanu / Anas Chkaifi / Javad Gholipour



TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 207 <b>Design and development of a combined intake fan test rig to enable investigations of stable operating ranges</b>	Jonas Grubert	Lionel Meillard / Peter Winkelmann / Patrick Brunow / Jens Friedrichs / Rainer Schnell / Jens Ortmanns
ISABE 2022 208 <b>Sand Erosion Modeling in Generic Compressor Rig Testing</b>	Lei-Yong Jiang	Xijia Wu / Qi Yang
ISABE 2022 209 <b>Experimental Investigation of Bleed Air Extraction for different stator and stage setups</b>	Daniel Kessler	Jens Friedrichs / Bernd Becker / Patrick Grothe
ISABE 2022 211 <b>Experimental Characterisation of Test Facility Control Elements for Mass Flow Determination</b>	Constanze Schiewe	Stephan Staudacher
ISABE 2022 212 <b>An altitude capable rig for studying engine inlet velocity profile effects Boundary layer generator</b>	Faezeh Rasimarzabadi	Catherine Clark / Martin Neuteboom / David Orchard / Hans Martensson
ISABE 2022 213 <b>Investigation of flow migration downstream of the rotor in the Large Scale Turbine Rig using foreign gas tracing</b>	Hellen Erik N. De Winter	Johannes Eitenmüller / Sebastian Leichtfuß / Heinz-Peter Schiffer / Christoph Lyko / Gregor Schmid
ISABE 2022 215 <b>Design of Porous Media for Optimal Combustion Liner Transpiration Cooling</b>	Mathieu Hinse	Mohsen Broumand / Patrick Richer / Bertrand Jodoin / Sean Yun / Zekai Hong
ISABE 2022 216 <b>Platform Leakage and Blade Tilting in Axial Compressor CFD Simulations</b>	Jannik Petermann	Bernd Becker / Volker Gümmer
ISABE 2022 217 <b>Exploring the Operational Strategy of an Electrically-Driven Variable Pitch BLI-Fan</b>	Maximilian Mennicken	Rainer Schnell / Max Arzberger

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 219 <b>Studies on an Electric Hybrid Adaptive Cycle Engine</b>	Philipp Jäger	Marcel Stöbel / Michael Krummenauer / Reinhard Niehuis
ISABE 2022 220 <b>Analysis of Flow Behaviour in a Tandem Rotor under Clean and Distorted Inflows</b>	Probuddho Chatterjee	Amit Kumar / A. M. Pradeep
ISABE 2022 222 <b>Effects of flame-flame interaction on emission characteristics in gas turbine combustors</b>	Sanghyeok Kwak	Jaehong Choi / Myungguen Ahn / Seongpil Joo / Min Chul Lee / Youngbin Yoon
ISABE 2022 223 <b>Influence of the Ending Position of Controllable Speed Casing on the Tip Flow in a Compressor Rotor</b>	Zhao Jiayi	Wu Wan-yang / Zhong Jing-jun
ISABE 2022 225 <b>Investigation on Flow Interactions in a Contra-Rotating Axial Compressor with Inflow Non-Uniformities</b>	Srinivas Prakash Diwanji	A. M. Pradeep
ISABE 2022 227 <b>Effect of nozzle chevron technology on the near-field contrail properties behind an aircraft engine using a CFD-microphysics coupling</b>	Sébastien Cantin	Fadrien Misandeau / Mohamed Chouak / François Garnier
ISABE 2022 228 <b>Numerical and Experimental Design of a Radial Displaceable Inlet Distortion Device</b>	Bojan Kajasa	Timea Lengyel-Kampmann / Robert Meyer
ISABE 2022 229 <b>Metal Particle Damper Characteristics for Gas Generator Cycle Air Turbo Ramjet Engine</b>	Ryojiro Minato	Hikaru Sasaki / Daisuke Nakata / Masaharu Uchiumi
ISABE 2022 230 (virtual) <b>Numerical and experimental investigation of non-reactive flow characteristics of a multi swirl lean direct injection burner</b>	Sarath P.	Aditya R. J. / Muruganandam T. M.

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 231 <b>Identification and Classification of Operating Flow Regimes and Prediction of Stall in a Contra-Rotating Axial Fan using Machine Learning</b>	Akshay Kumar	Akshay Kumar / M.P. Manas / A.M. Pradeep
ISABE 2022 232 <b>Robust Optimization Used in the Redesign of a Low-Speed Compressor Tandem Stator</b>	Samuele Giannini	Mattia Straccia / Volker Gümmer
ISABE 2022 234 <b>A Fast Tool for Prediction of Thermal Mechanical Effects on Turbine Tip Clearance</b>	Xiaojian Ma	Theoklis Nikolaidis
ISABE 2022 235 <b>Introduction and Evaluation of an Aerostructural Coupling Approach for the Design of Shape Adaptive Compressor Blading</b>	Marcel Seidler	Jens Friedrichs / Zhuzhell Montano Rejas / Johannes Riemenschneider
ISABE 2022 236 <b>Degradation of Turbo-electric Distributed Propulsion Systems</b>	Anmol Midha	Suresh Sampath
ISABE 2022 241 <b>Performance of a Turbojet Engine with Fluidic Thrust Vectoring</b>	Ramraj Harikanth Sundararaj	T. Chandra sekar / Rajat Arora / Abhijit Kushari
ISABE 2022 242 <b>Numerical Investigation of Flow Characteristics Inside an Exhaust Duct System</b>	Sindhuja Priyadarshini	Vinayak S. Kamath / Rajat Arora / Ramraj H Sundararaj / T. Chandra Sekar / Abhijit Kushari
ISABE 2022 245 <b>Near-stall modelling of a pitching airfoil at high incidence, Mach number and reduced frequency</b>	Christoph Brandstetter	Sina Stapelfeldt
ISABE 2022 249 <b>On the Loss Behavior of a Split Blade VIGV Configuration at Varied Stagger Angle Combinations</b>	Roman Gawin Frank	Niklas Seer / Hanno Wegner / Reinhard Niehuis

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 250 <b>Highly accurate loss determination at the Large Scale Turbine Rig (LSTR) with varying rotor tip configurations</b>	Johannes Eitenmüller	Dr.-Ing. Sebastian Leichtfuß / Prof. Dr.-Ing. Heinz-Peter Schiffer / Christoph Lyko / Dr.-Ing. Gregor Schmid
ISABE 2022 251 <b>Investigation of Damage Behaviour and Response Surface Optimisation of Auxetic Structures for Application in Fan- and Compressor Casings and Containment Layers</b>	Stefan Schröter	Stefan Schröter / Volker Gümmer
ISABE 2022 253 <b>Choosing Propulsion System Composition and Parameters for a Supersonic Cruising Aircraft</b>	Mykhailo Shevchenko	Kislov Oleh / Yurii Ulitenko
ISABE 2022 254 <b>Virtual Gas Turbines: A Novel Flow Network Solver Formulation for the Automated Design-Analysis of Secondary Air System</b>	Davendu Kulkarni	Luca di Mare
ISABE 2022 255 <b>Comparison of Different CFD Unsteady Methods for the Performance</b>	Lucilene Moraes da Silva	Tomas Grönstedt / Jesuino Takachi Tomita / Marcelo Assato / Vitor Alexandre Carlesse Martins
ISABE 2022 256 <b>On the importance of condensation for the thermodynamic cycle of fuel cell turbochargers in aviation</b>	Tim Wittmann	Sebastian Lück / Tim Hertwig / Jens Friedrichs
ISABE 2022 257 <b>Hydrogen Combustor Integration Study for a V2500-Type Aircraft Engine using the Dry-Low NOX Micromix Combustion Principle</b>	Harald Funke	Nils Beckmann / Lukas Stefan

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 262 <b>Effects of bypass ratio for civil turbofans using thrust reversers</b>	Jingjie Huang	Pericles Pilidis
ISABE 2022 269 <b>Improving Adiabatic Film Cooling Effectiveness by Varying the Compound Angles of Effusion Cooling Holes along Main Flow Direction</b>	Yeongmin Pyo	Patrick Richer / Bertrand Jodoin / Sean Yun / Zekai Hong / Mohsen Broumand
ISABE 2022 272 <b>Numerical Study on Thermo-Acoustic Instability in a Simplified 2D Gas Turbine Afterburner</b>	Muthaiah M.	Varunkumar S.
ISABE 2022 275 <b>Aeromechanical optimization of an axial compressor stage</b>	Seif Elmasry	Bernd Beirow / Felix Figaschewsky / Thomas Giersch
ISABE 2022 277 <b>CFD Investigation of aircraft propulsion fire suppression system</b>	Akhil Dinesh	Suresh Sampath / Michael Diakostefanis
ISABE 2022 278 <b>Streamline-Traced, External-Compression Supersonic Inlets for Mach 2</b>	John W. Slater	N/A
ISABE 2022 279 <b>Turbine Rotor Design – 3D Stress Analysis Automation</b>	Antoine Desponts	Hany Moustapha / Pascal Doran
ISABE 2022 281 <b>Development of topology optimization technique for air-cooled oil cooler: 3-D examination under laminar condition</b>	Tsukasa Ishii	Toshinori Watanabe / Takehiro Himeno

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 282 <b>Design optimization of axial turbine disc and attachment for aeroengine</b>	Najeh Najeh	Pascal Doran / Benoit Blondin / Hany Moustapha
ISABE 2022 284 <b>Multi-objective multi-disciplinary optimisation of propellers</b>	Dries Verstraete	Shahfiq Shahjahan / Rens MacNeill
ISABE 2022 285 <b>Assessment of weld manufacturability of alternative jet engine structural components through digital experiments</b>	Julian Martinsson Bonde	Timos Kipouros / Arindam Brahma / Massimo Panarotto / Ola Isaksson Jonas Kressin / Petter Andersson / Kristina Wärmefjord / Rikard Söderberg / P. John Clarkson
ISABE 2022 289 <b>Low Cycle Fatigue Analysis of Turbine Disc – Implement of Low Cycle Fatigue Analysis on Gas Turbine Discs in Preliminary Design</b>	Florence Bérard	Acher-Igal Abenhaim / Pascal Doran / Benoit Blondin / Hany Moustapha
ISABE 2022 290 <b>Aerothermal Analysis of Film Cooling</b>	Katharina Stichling	Prof. Dr.-Ing. Hans-Jörg Bauer
ISABE 2022 291 <b>Hydrogen fuel cells for aviation? – A potential analysis comparing different thrust categories</b>	Marc Schmelcher	Jannik Häby
ISABE 2022 292 <b>Change in Performance and Rotordynamic Characteristics due to Compressor Fouling in Aero Gas Turbines</b>	Cesar Andres Valdes Vasquez	Suresh Sampath

TITLE	AUTHOR NAME	OTHER AUTHORS
ISABE 2022 294 <b>Assessment of the fuselage aft-region modification on BLI propulsion performance</b>	Ashik Vincent Palathingal	Jesuino Takachi Tomita / Cornelius Henricus Venner / Cleverson Bringhenti / Fabiola Paula Costa
ISABE 2022 295 <b>Detection and Analysis of Combustion Instabilities in Pre-cooled Turbojet Engine Model Ram Combustor by Using Autoencoder</b>	Koichi Omi	Kotaro Yoshihara / Daiki Ito / Hideyuki Taguchi / Shinji Nakaya / Mitsuhiro Tsue
ISABE 2022 296 <b>Investigation of a novel flow metric for the design and evaluation of nonaxisymmetric turbine endwall contours</b>	Jonathan Olaf Paul Bergh	Glen Snedden
ISABE 2022 297 <b>Development of Test Facility for Hybrid Electric Aviation Propulsion: A Conceptual Review</b>	Doug Marsh	Adam Elliot / Michael Lam / Patrick Sylvain / George Hajecek
ISABE 2022 302 <b>Predicting droplet size and velocity of flow-blurring injection utilizing artificial neural networks</b>	Afshin Banazadeh	N/A
ISABE 2022 313 <b>Hydrogen Propulsion for Civil Aviation: Isidoros Pantelis An Introduction Scenario</b>	Isidoros Pantelis	Jon Huete / Devaiah Nalianda / Elżbieta Jarzębowska / Pericles Pilidis



Credit to Ottawa Tourism for some images  
and content used in this brochure.

**Contact Us: ISABE 2022**

[www.isabe.org](http://www.isabe.org)

[NRC.ISABE2022-SIMA2022.CNRC@nrc-cnrc.gc.ca](mailto:NRC.ISABE2022-SIMA2022.CNRC@nrc-cnrc.gc.ca)

Local Organizer



National Research  
Council Canada

Conseil national de  
recherches Canada

