SAE INTERNATIONAL®

EVENT GUIDE

INTERNATIONAL CONFERENCE ON ICING

Of Aircraft, Engines, and Structures

JUNE 17-21, 2019
MINNEAPOLIS, MN

sae.org/icing

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AIAA
Shaping the Future of Aerospace

AVIATION FORUM

The icing community will convene next year at the 12th AIAA Atmospheric and Space Environments Conference held at the AVIATION Forum.

Key topics include:

- Aircraft in-flight icing, simulation, performance effects
- Certification and regulatory policies and procedures
- Engine ice-crystal icing and simulation
- Ground deicing/anti-icing fluids, effects, facilities
- Ice-protection systems and detection
- Icing and ice-crystal test methods and facilities
- Icing environment meteorology, diagnosis and forecasting
- Icing related safety and training
- Remote sensing, detection and characterization
- Rotorcraft icing, simulation and performance effects

15-19 June 2020

Reno-Sparks Convention Center

Reno, Nevada

Abstract Deadline: 6 November 2019

www.aiaa.org/aviation

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PLATINUM

Collins Aerospace

INTERNATIONAL CONFERENCE ON ICING OF AIRCRAFT, ENGINES, AND STRUCTURES

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EMERGENCY PROCEDURES DURING THE SAE 2019 INTERNATIONAL CONFERENCE ON ICING OF AIRCRAFT, ENGINES, AND STRUCTURES

During the SAE 2019 International Conference on Icing of Aircraft, Engines, and Structures attendees are to follow the established emergency guidelines of the facility where the emergency occurs. **Based on the location of the incident, report emergencies to the nearest venue representative and/or security personnel if available, or report to the SAE registration area.**

Should a catastrophic event occur, attendees should follow the safety and security instructions issued by the facility at the time of the event. This includes listening for instructions provided through the public address system and following posted evacuation routes if required.

In the event of an emergency or a major disruption to the schedule of events at the conference, attendees and exhibitors may call this number to receive further information about the resumption of this event. Updates will also be provided via the SAE website at sae.org/icing.

SAE EMERGENCY HOTLINE

+1.724.772.4044
+1.800.581.9295

Attendees are permitted to bring camera equipment onto the show floor. Exhibitors retain the right to restrict photography of their products or displays and such decisions are within the discretion of the exhibitor and are not controlled by SAE International.

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EVENT-AT-A-GLANCE

June 17 MONDAY

10:00 a.m.-6:00 p.m.
Registration

1:30-2:45 p.m.
Opening Ceremony & Keynote
Greenway A-C & H-J

2:45-3:15 p.m.
Networking Break
Greenway Promenade

3:15-4:45 p.m.
Keynotes
Greenway A-C & H-J

June 18 TUESDAY

7:30 a.m.-5:00 p.m.
Registration

8:00-9:30 a.m.
Technical Sessions

9:30-10:00 a.m.
Networking Break
Northstar Ballroom

10:00 a.m.-12:00 p.m.
Technical Sessions

12:00-1:30 p.m.
Networking Lunch
Northstar Ballroom

1:30-3:00 p.m.
Technical Sessions

3:00-3:30 p.m.
Networking Break
Northstar Ballroom

3:30-5:00 p.m.
Technical Sessions

5:00-6:00 p.m.
Welcome Reception
Northstar Ballroom

June 19 WEDNESDAY

7:30 a.m.-5:00 p.m.
Registration

8:00-9:30 a.m.
Technical Sessions

9:30-10:00 a.m.
Networking Break
Northstar Ballroom

10:00 a.m.-12:00 p.m.
Technical Sessions

12:00-1:30 p.m.
Networking Lunch
Northstar Ballroom

1:30-3:00 p.m.
Technical Sessions

3:00-3:30 p.m.
Networking Break
Northstar Ballroom

3:30-5:00 p.m.
Technical Sessions

June 20 THURSDAY

7:30 a.m.-3:30 p.m.
Registration

8:00-9:30 a.m.
Technical Sessions

9:30-10:00 a.m.
Networking Break
Northstar Ballroom

10:00 a.m.-12:00 p.m.
Technical Sessions

12:00-1:30 p.m.
Networking Lunch
Northstar Ballroom

1:30-3:00 p.m.
Technical Sessions

3:00-3:30 p.m.
Networking Break
Northstar Ballroom

3:30-4:30 p.m.
Technical Sessions

June 21 FRIDAY

Registration Closed

8:00-10:00 a.m.
Closing Remarks & Track Chair Report-Outs
Greenway A-C & H-J

10:00-10:30 a.m.
Networking Break
Greenway Promenade

10:30 a.m.-12:00 p.m.
Track Chair Report-Outs
Greenway A-C & H-J

TECHNICAL SESSION

NETWORKING OPPORTUNITY

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EVENT INFORMATION

Registration
Greenway Promenade

Monday, June 17
10:00 a.m.–6:00 p.m.

Tuesday, June 18
7:30 a.m.–5:00 p.m.

Wednesday, June 19
7:30 a.m.–5:00 p.m.

Thursday, June 20
7:30 a.m.–3:30 p.m.

Exhibit Hours
Northstar Ballroom

Tuesday, June 18
9:30 a.m.–6:00 p.m.

Wednesday, June 19
9:30 a.m.–3:30 p.m.

Thursday, June 20
9:30 a.m.–3:30 p.m.

Networking Lunches
Northstar Ballroom

Tuesday – Thursday,
June 18-20
12:00–1:30 p.m.

Welcome Reception
Northstar Ballroom

Tuesday, June 18
5:00–6:00 p.m.

Wifi Informaton
SSID: Hyatt Meeting Space
Password: SAE2019

SAE 2019 INTERNATIONAL CONFERENCE ON ICING OF AIRCRAFT, ENGINES, AND STRUCTURES PLANNING COMMITTEE MEMBERS

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Vince LoPresto
Collins Aerospace

CHAIRPERSON
Philippe Villedieu
ONERA

Gene Addy

Walter Affonso
Embraer

Philip Alldridge
Sikorsky Aircraft Corporation

Gilles Aouizerate
SAFRAN Aircraft Engines

Roger Aubert
Bell Flight

Guido Baruzzi
ANSYS Inc.

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Alberto Pueyo
Bombardier

Emmanuel Radenac
ONERA

WELCOME LETTER

It is our pleasure to welcome you to the 2019 International Conference on Icing of Aircraft, Engines, and Structures. After three years of planning, we are excited to spend the next five days with the world's experts in the field of icing. In addition to sharing the latest research and development activity through over 160 technical presentations, we have organized keynote talks on several interesting topics.

Our opening plenary session on Monday covers two topics that are new to the icing community and one that has been significantly updated. Robert Gregg from the Boeing Company will discuss certification by analysis techniques, followed by Jacques Leroux from Dow Chemical with the newly updated guide to aircraft ground deicing. The Monday session closes with a discussion of hypersonic airliner icing considerations by Joe Vogel from the Boeing Company.

The technical sessions run from Tuesday through Thursday and are organized into the following 9 tracks. Sub-topics include new regulations, recent improvements in icing test facilities, the latest research and flight test efforts, advances in icing meteorology, icing on the ground and a new category introduced for the first time this year, Unmanned Aircraft Systems. Since we will be running five sessions in parallel, we encourage you to look ahead and carefully plan which parallel talk is the highest priority for you. Fortunately, when authorized by the presenters, the presentations will be available after the conference as will all of the formal papers.

- **Aircraft Inflight Icing**
- **Test Facilities**
- **Icing of Structures and Aircraft on the Ground**
- **Environmental Icing Meteorology and Instruments**
- **Icing Regulations and Requirements**
- **Appendix C**
- **Ice Crystals**
- **Supercooled Large Drops (SLD)**
- **Unmanned Aircraft Systems**

The Friday plenary session begins with updates from EASA and the FAA on the latest icing regulations. Closing out the conference is a report-out from each of the nine technical tracks and an open discussion of key themes, implications, and how they should direct the future of icing. The schedule includes ample opportunity for networking throughout the conference as there are several breaks, lunches and receptions. Also be sure to check out our exhibitors displaying new and innovative products and services.

This is a great time of year to visit Minneapolis. We hope you'll take some time to enjoy the "City of Lakes" including the Stone Arch Bridge, Saint Anthony Falls, the extensive lineup of great restaurants and maybe a stroll around the chain of lakes. This conference would not be possible without the efforts of many of the attendees who volunteered their time and expertise to the cause. We sincerely thank those who helped make this conference a reality and we wish all of you an interesting and productive week.

Sincerely,

Vince LoPresto
Co-chair

Philippe Villedieu
Co-chair

SAE 2019 INTERNATIONAL CONFERENCE ON ICING OF AIRCRAFT, ENGINES, AND STRUCTURES PLANNING COMMITTEE CO-CHAIRS

Vince LoPresto
Associate Director, Product Strategy | Avionics
Collins Aerospace

Vince LoPresto began his career as a design engineer for Rosemount Aerospace (now Collins Aerospace) in 1991. During his tenure, he has held positions in engineering, business development, program management, and product line management. In his current position at Collins Aerospace, he is an associate director responsible for product strategy of ice detectors, ice protection controllers, angle of attack sensors and aircraft windshield wiper systems.

As a member of the SAE AC-9C Aircraft Icing Technology Committee, Vince chairs several panels. Additionally, he has worked with the European Organization for Civil Aviation Equipment (EUROCAE), including officer positions as chairman of the in-flight subgroup of EUROCAE Working Group 54 on ice detection, secretary of Working Group 89 on Pitot and Pitot-static probes, and secretary of Working Group 95 on ice detection. He received the EUROCAE "International Contributor" award for 2016.

Vince received bachelor's and master's degrees in Aerospace Engineering from the University of Minnesota. He holds two patents in the field of aircraft icing.

Vince has lived in Minnesota since the age of 4 months and is excited to be hosting the conference in his home state. He is married with two children (ages 17 and 21) and enjoys singing in a rock band and in his church choir.

Philippe Villedieu
Research Director
ONERA

Philippe Villedieu was born in Clermont-Ferrand (France) in 1967. He received his master's degree from SUPAERO Aerospace Engineering School in 1990 and his PhD in applied Mathematics from Toulouse University of Science in 1994.

He then began his career as a research engineer at ONERA, working on the development of numerical algorithms and computational tools for fluid mechanics. In particular he was very involved in the development of the CEDRE multiphysics code for which he was responsible for the Lagrangian solver dedicated to the modelling of dispersed phases (solid particles or droplets).

In 2011 he took over the responsibility of the ONERA icing team whose main mission is the development of numerical modelling tools for the aeronautical industry. He was involved in several national and international research projects related to icing, he joined the SAE AC9C working group in 2015, and is currently the coordinator of the MUSIC-haic European project dedicated to the development and validation of 3D numerical tools for ice crystal icing. In 2017, he was appointed as deputy scientific director of the ONERA research department of Multiphysics for Energetics.

In parallel of his career at ONERA, Philippe Villedieu is also an associate professor in the Applied Mathematics department of the INSA-Toulouse engineering school since 1999.

SPECIAL EVENTS OPENING CEREMONY & KEYNOTES

Monday, June 17
Greenway A-C & H-J

1:30–2:45 p.m.

Welcome
1:30–2:00 p.m.

Vince LoPresto
Associate Director, Product Strategy | Avionics
Collins Aerospace

Certification by Analysis
2:00–2:45 p.m.

Robert Gregg
Sr. Manager Aircraft Programs
Boeing Co.

Robert (Robb) Gregg is the Chief Aerodynamicist for Boeing Commercial Airplanes. He was named to this position in March 2013. Mr. Gregg achieved this status due to his technical contributions and leadership in the broad area of applied aerodynamics, and more specifically in advanced aerodynamic and aircraft concepts and design.

In 2011, Mr. Gregg became Chief Engineer of Flight Sciences Product Development & Technology. Here, he managed the Aerodynamic Configuration Development of the Boeing 737MAX, 787-10X, and 777X Aircraft, along with managing the Flight Sciences Technology Portfolio.

Robb joined McDonnell Douglas-Long Beach in June of 1978. His assignments over his 41 years as an Engineer include Applied Research in Aerodynamics, Applied Aerodynamic Design and Product Development. Robb's early work experience includes C-17 Initial Sizing and Wing/Winglet Development, Advanced Transonic Wing Design, Inventing the patented Divergent Trailing-Edge Airfoil and challenging assignments including MD-11 Aerodynamics Program Manager, MD-11 Cruise Performance Improvement Program Management, and Chief Aerodynamics Engineer for both the MD-12 and MD-XX Aircraft Development Programs.

In addition to all of the internal activities that Robb has lead, during his career he has also heavily engaged with numerous External institutions. He is a member of the NASA Subsonic Fixed Wing Technical Working group. He has been a panelist on multiple AIAA sessions discussing CFD, Certification by Analysis, and Aircraft Design and gave an invited presentation on Certification By Analysis at the AIAA Aviation 2016 Conference. Currently Robb is leading the AIAA Certification by Analysis Community of Interest with a goal of producing a Best Practices Document later this year (2019) and eventually published via the AIAA Standards process.

Robb received his BS in Aerodynamics and Astronautics from the University of Illinois in 1978 and his MS in Aero at the University of Southern California in 1984.

SPECIAL EVENTS OPENING CEREMONY & KEYNOTES

Monday, June 17
Greenway A-C & H-J

3:15–4:45 p.m.

Guide to Aircraft Ground Deicing
3:15–4:00 p.m.

Jacques Leroux
Account Executive
Dow Chemical Canada ULC

Jacques Leroux is an account executive with Dow Chemical Canada ULC. He is responsible for sales and technical service for aircraft deicing/anti-icing fluids in Canada and for technical liaison with international airlines. He was part of the R&D team responsible for the development and commercialization of the Type III and Type IV aircraft anti-icing fluids. He is the author of the Guide to Aircraft Ground Deicing.

In 2006, Jacques was the recipient of the SAE Technical Standards Board Outstanding Contribution Award, in 2007 the SAE International Chair Leadership Award and in 2011 the Henry Souther Standards Award, recognizing accomplishments in standards development.

Jacques is Chair of the SAE G-12 Steering Group on Aircraft Ground Deicing, Co-chair of the SAE G-12 Aircraft Deicing Fluid and Runway Deicing Product Committees and Chair of the SAE/ICAO/IATA Council for Globalized Aircraft Deicing Standards. He holds a Ph. D. in Chemistry from McGill University and is a member of the Quebec Order of Chemists. He lives in Montreal and loves to sail.

Hypersonic Airliner Icing
4:00–4:45 p.m.

Joseph Vogel
Hypersonic Passenger Airplane (HPA), Program Manager
Boeing Co.

Joseph Vogel began his career as a project engineer for the National Aeronautics and Space Administration in 1987. He held positions on the Space Shuttle and Space Station Programs involved with procurement, design, build and test. He joined The Boeing Company in 1999 and is currently the Hypersonic Passenger Airplane (HPA) Program Manager. HPA is focused on the development of a commercially viable hypersonic passenger airplane. Joe's duties include managing the engineering development through flight test including the administration of the associated cost, schedule and technical performance.

Joseph was previously Director of Hypersonics in Boeing Phantom Works / Defense Space & Security where he was Program Manager for DARPAs low cost access to space endeavor, Air Launch Space Access (ALASA), and AFRL's Award Winning Hypersonic X-51A Scramjet Engine Demo (SED) WaveRider Program.

Previous Boeing assignments included his role as Director of Space Shuttle Upgrades and leadership duties in the development of a Shuttle to Station Fuel Transfer System, Cockpit Avionics Upgrades and various Shuttle Systems Integration projects.

Joseph received his Bachelor's degree in Mechanical Engineering from California State University and a Master's degree in Business Administration from La Verne University- La Verne California.

Joseph loves spending time with his wife and his two children. They delight in taking vacations that include camping, skiing, hiking and climbing. In his spare time Joe not only enjoys traveling but also gardening and wood working.

For more program details, please go to sae.org/icing or the Icing Mobile App.

Refer to the App for the most up-to-date program information.

SPECIAL EVENTS CLOSING REMARKS & KEYNOTES

Friday, June 21
Greenway A-C & H-J

8:00–9:30 a.m.

EASA Update
8:00–8:45 a.m.

Laurent Fleury
Senior Expert icing & Environmental Control Systems
European Aviation Safety Agency (EASA)

Laurent Fleury joined the European Aviation Safety Agency (EASA) in April 2006.

As Senior Expert for Environmental Control systems (ECS) and Icing, he acts as a focal point for specific technical subjects in his field of expertise and is point of reference in regards to technical advice for Experts and EASA Management. He is as well deeply involved in current certifications and validations.

Prior to joining EASA, Laurent Fleury worked from 1993 for the French Civil Aviation Authority (DGAC) as an expert in certification of ECS and Icing systems both for aeroplanes and helicopters, after being graduated from Ecole Nationale Supérieure d'Ingénieurs de Constructions Aéronautiques (ENSICA) in Toulouse.

FAA Update
8:45–9:30 a.m.

Paul Pellicano
Aerospace Engineer
Federal Aviation Administration (FAA)

Federal Aviation Administration, Aviation Safety, Policy and Innovation, Small Airplane Standards Branch

Paul Pellicano is an aerospace engineer in the Small Airplane Standards Branch of the Federal Aviation Administration (FAA) where he is responsible for icing regulations and policy on part 23 airplanes, airships, unmanned aircraft systems, and urban air mobility airplanes. He joined the FAA in 1998 as a flight test engineer, transitioning to his current position in 2001. Prior to joining the FAA, Paul worked in industry for 17 years as a stability and control flight test engineer for Fairchild Republic, Grumman Aerospace (now part of Northrop Grumman), Gulfstream Aerospace, and Lockheed Martin. His industry career provided him the opportunity to flight test U.S. military aircraft, experimental aircraft with NASA, and commercial aircraft.

As a member of the ASTM F44 General Aviation Committee, Paul worked with industry to develop consensus standards that have been accepted by the FAA as means of compliance for the most recent part 23 icing certification rules that became effective in 2017. He is also a member of the SAE AC-9C icing technology subcommittee.

Paul received bachelor's and master's degrees in Aerospace Engineering from the Polytechnic Institute of NY (now the Tandon School of Engineering at New York University).

Paul was born and raised in New York. Before finally settling down in Georgia, where he currently resides, he has worked and lived in New York, California and Italy. He does not miss the cold and snow of NY winters, which allows him more opportunities to get frustrated on the golf course. Paul is married with two children (ages 21 and 17).

Abstract
New part 23 rules for aircraft certification became effective in 2017. The new rules are high level and non-prescriptive, with means of compliance in industry consensus standards. The new rules maintained the level of safety except in the areas of loss of control and icing, where they were increased. This presentation will discuss the changes in the area of icing and how they have worked out so far. The FAA has received type certificate applications for numerous unmanned aircraft systems and several urban air mobility aircraft. This presentation will discuss plans for how the FAA will address icing on these aircraft.

SPECIAL EVENTS CLOSING REMARKS

Friday, June 21 9:30 a.m.–12:00 p.m. **Greenway A-C & H-J**

Time	Title
9:30–10:00 a.m.	**Track Chair Report-Outs Part I**
10:30–11:30 a.m.	**Track Chair Report-Outs Part II**
11:30 a.m.–12:00 p.m.	**Wrap-up: Gaps Between Regulatory Authority Updates and Issues from Tracks**

For more program details, please go to sae.org/icing or the Icing Mobile App.

Refer to the App for the most up-to-date program information.

TECH STANDARDS COMMITTEE MEETINGS

Attend an SAE Tech Standards Committee meeting

Thursday, June 13 – Friday, June 14

Group	Location	Time
AC-9 Aircraft Environmental Systems Committee	Lake Superior A	8:30 a.m.–5:00 p.m.

Sunday, June 16

Group	Location	Time
AC-9C Aircraft Icing Technology Committee	Lake Superior A & B	8:30 a.m.–5:30 p.m.
AC-9M Cabin Air Measurement Committee	Skyway	8:30 a.m.–5:00 p.m.

Monday, June 17

Group	Location	Time
AC-9C Aircraft Icing Technology Committee	Lake Superior A & B	8:30 a.m.–12:15 p.m.
AC-9M Cabin Air Measurement Committee	Skyway	8:30 a.m.–5:00 p.m.

TECH SESSIONS WEEK AT A GLANCE

	TUE		WED		THUR			
	AM	PM	AM	PM	AM	PM	Room No.	Page No.
AIRCRAFT INFLIGHT ICING								
Aircraft Inflight Icing: Icing Detection Systems (Part 1 & 2) (ICE101)	✔	-	-	-	-	-	Mirage	
Aircraft Inflight Icing: Icephobic Coatings (Part 1 of 3) (ICE102)	-	-	✔	-	-	-	Mirage	
Aircraft Inflight Icing: Icephobic Coatings (Part 2 of 3) (ICE102)	-	-	-	✔	-	-	Mirage	
Aircraft Inflight Icing: Icephobic Coatings (Part 3 of 3) (ICE102)	-	-	-	✔	-	-	Mirage	
Aircraft Inflight Icing: Fundamental Studies of Melting and Runback Phenomena (ICE102)	-	✔	-	-	-	-	Mirage	
Aircraft Inflight Icing: Thermal Ice Protection Systems (Part 1 of 3) (ICE103)	-	-	-	-	✔	-	Mirage	
Aircraft Inflight Icing: Thermal Ice Protection Systems (Part 2 of 3) (ICE103)	-	-	-	-	-	✔	Mirage	
Aircraft Inflight Icing: Thermal Ice Protection Systems (Part 3 of 3) (ICE103)	-	-	-	-	-	✔	Mirage	
Aircraft Inflight Icing: Innovative Ice Protection Systems (ICE103)	-	-	-	-	✔	-	Mirage	
Aircraft Inflight Icing: Flight Test Campaigns (ICE104)	-	-	✔	-	-	-	Mirage	
APPENDIX C								
Appendix C: Modeling - Ice Accretion & Film (Part 1 & 2) (ICE602)	✔	✔	-	-	-	-	Greenway A-C & H-J	
Appendix C: SUNSET & Wind Tunnel Testing (Part 1 & 2) (ICE601)	✔	-	✔	-	-	-	Greenway A-C & H-J	
Appendix C: Modeling - Applications (ICE607)	-	-	-	-	✔	-	Greenway A-C & H-J	
Appendix C: Modeling - CFD (ICE603)	-	✔	-	-	-	-	Greenway A-C & H-J	
Appendix C: Modeling - Droplet Trajectory (ICE606)	-	-	-	-	✔	-	Greenway A-C & H-J	
Appendix C: Modeling - Ice Protection & Shedding (ICE605)	-	-	-	✔	-	-	Greenway A-C & H-J	
Appendix C: Modeling - Protection Grids & Roughness (ICE604)	-	-	✔	-	-	-	Greenway A-C & H-J	
Appendix C: Modeling - Roughness (ICE604)	-	-	-	✔	-	-	Greenway A-C & H-J	
ENVIRONMENTAL ICING METEOROLOGY AND INSTRUMENTS								
Environmental Icing Meteorology and Instruments: Airborne Measurements in SLD Conditions (ICE402)	✔	-	-	-	-	-	Regency	
Environmental Icing Meteorology and Instruments: Forecast and Detection of HIWC Areas (ICE403)	-	✔	-	-	-	-	Regency	
Environmental Icing Meteorology and Instruments: Forecast and Detection of Icing Regions (Liquid and Ice Crystal Icing) (ICE403)	-	✔	-	-	-	-	Regency	
Environmental Icing Meteorology and Instruments: New Advances in International Inflight Icing Forecast Systems (ICE403)	✔	-	-	-	-	-	Regency	
Environmental Icing Meteorology and Instruments: New Measurement Techniques and Evaluation Methods (ICE401)	-	-	✔	-	-	-	Regency	

TECH SESSIONS WEEK AT A GLANCE

	TUE		WED		THUR			
	AM	PM	AM	PM	AM	PM	Room No.	Page No.
ICE CRYSTALS								
Ice Crystals: Experimental Investigation of Ice Crystal and Mixed Phase Icing (Part 1 - 4) (ICE702)	✔	✔	-	-	-	-	Greenway DE	
Ice Crystals: Modeling (Part 1 - 5) (ICE703)	-	-	✔	✔	✔	✔	Greenway DE	
Ice Crystals: Flight Test Characterization of Ice Crystal Icing Conditions (ICE701)	-	-	-	-	✔	-	Greenway DE	
ICING REGULATIONS AND REQUIREMENTS								
Icing Certification (ICE501)	-	✔	-	-	-	-	Mirage	
ICING OF STRUCTURES AND AIRCRAFT ON THE GROUND								
Icing of Structures and Aircraft on the Ground: Ground Icing and Deicing of Aircraft (Part 1 of 3) (ICE302)	-	-	✔	✔	-	-	Greenway FG	
Icing of Structures and Aircraft on the Ground: Ground Icing of Power Lines and Cables (ICE303)	-	-	-	-	✔	-	Greenway FG	
Icing of Structures and Aircraft on the Ground: Ground Icing of Wind Turbines (ICE303)	-	-	-	-	✔	-	Greenway FG	
SUPERCOOLED LARGE DROPS (SLD)								
Supercooled Large Drops (SLD): SLD Icing Modeling (Part 1 & 2) (ICE803)	-	-	-	✔	-	-	Regency	
Supercooled Large Drops (SLD): Advanced Instrumentation for SLD Icing Conditions (Part 1 - 3) (ICE801)	-	-	-	-	✔	✔	Regency	
Supercooled Large Drops (SLD): Wind Tunnel Experimentations in SLD Icing Conditions (ICE802)	-	-	-	-	✔	-	Regency	
TEST FACILITIES								
Test Facilities: Ice Adhesion Tests (ICE203)	-	✔	-	-	-	-	Greenway FG	
Test Facilities: Icing Test Capabilities (ICE201)	✔	-	-	-	-	-	Greenway FG	
Test Facilities: Icing Wind Tunnel Instrumentation (ICE202)	✔	-	-	-	-	-	Greenway FG	
UNMANNED AERIAL SYSTEMS								
(Part 1 & 2) UAV Icing (ICE900)	-	-	-	-	-	✔	Greenway FG	

For more program details, please go to sae.org/icing or the Icing Mobile App.

Refer to the App for the most up-to-date program information.

TECH SESSIONS

TUESDAY, JUNE 18 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	(Part 1 of 2) Appendix C: SUNSET & Wind Tunnel Testing (ICE601) This session includes presentations on the growing field of wind turbine icing. 8:00 a.m. - 9:30 a.m. Organizers: Fabien Dezitter, Airbus; Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 1 of 2) Aircraft Inflight Icing: Icing Detection Systems (ICE101)** This session describes the development of new HAIC/HIWC instrumentation and testing of these instruments in wind tunnels. 8:00 a.m. - 9:30 a.m. Organizers: Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA Chairperson: Jim Hoppins, Textron Aviation	**(Part 1 of 4) Ice Crystals: Experimental Investigation of Ice Crystal and Mixed Phase Icing (ICE702)** This session includes presentations on recent developments for and tests in NASA's PSL ice crystal test facility. 8:30 a.m. - 9:30 a.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Dave Dischinger, Honeywell Aerospace; Ashlie B. Flegel, NASA John Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Environmental Icing Meteorology and Instruments: Airborne Measurements in SLD Conditions (ICE402)** This session presents recent activities and advances in airborne measurements of supercooled large droplet (SLD) icing conditions. 8:00 a.m. - 9:30 a.m. Organizers: Julie Haggerty, National Center for Atmosphere Research (NCAR); Tina Jurkat, DLR German Aerospace Center; Alexei Korolev, Environment & Climate Change Canada; Christine LeBot, Meteo-France; Philippe Villedieu, ONERA Chairperson: Christiane Voigt, DLR German Aerospace Center	**Test Facilities: Icing Wind Tunnel Instrumentation (ICE202)** This session describes new instruments under development for icing conditions aloft, including supercooled large drop (SLD) icing conditions. 8:00 a.m. - 9:30 a.m. Organizers: Dan Fuleki, James MacLeod, National Research Council Canada; Philippe Villedieu, ONERA Chairpersons: Dan Fuleki, National Research Council Canada; Daniel Knezevici, General Electric Co
8:00 a.m.	IGLOO3D Computations of the Ice Accretion on Swept-Wings of the SUNSET2 Database **(2019-01-1935)** Emmanuel Radenac, Helene Gaible, Herve Bezard, Philippe Reulet, ONERA / DMPE Université de Toulouse	The SENS4ICE EU Project - SENSors and Certifiable Hybrid Architectures for Safer Aviation in Icing Environment **(Oral Only)** Carsten Schwarz, Per Ohme, Christoph Deiler, DLR German Aerospace Center		Improved Analysis of Images of Spherical Droplets in 2D Particle Probes for Characterization of Supercooled Sprays **(Oral Only)** Alexei Korolev, Ivan Heckman, Environment & Climate Change Canada	Liquid Water Content Measurement with Laser Illuminated Imaging **(Oral Only)** Norbert Karpen, Elmar Bonaccurso, Vittorio Vercillo, Alexandre Laroche, Airbus
8:30 a.m.	Aerodynamic Assessment of Complex 3D Ice Shape Replications **(2019-01-1936)** Reinhard Puffing, Wolfgang Hassler, FH Joanneum GmbH; Thomas Neubauer, David Kozomara, Austrian Institute for Icing Sciences; Hermann Ferschitz, Rail Tec Arsenal	Perspectives for Ice Detection Technologies **(Oral Only)** Mathieu Pamies, SAFRAN Aerosystems	A New Wind Tunnel Facility for Ice Crystal Icing Experiments **(2019-01-1926)** Ramiz Saeed, David Buttsworth, Khalid Saleh, University of Southern Queensland	The In-Cloud ICing and Large-drop Experiment (ICICLE) **(Oral Only)** Stephanie DiVito, Danny Sims, James Riley, Federal Aviation Administration; Julie Haggerty, Scott Landolt, National Center for Atmospheric Research (NCAR); Ben Bernstein, Leading Edge Atmospherics; Mengistu Wolde, National Research Council of Canada; Alexei Korolev, Environment & Climate Change Canada	Effect of Icing Environment and Humidity on Reference Air Data Parameters in an Icing Tunnel **(2019-01-1929)** Mac Whalen, Brian Matheis, Collins Aerospace
9:00 a.m.	AIWTEC Mean & Services **(Oral Only)** Sébastien DIJON, Jean Pierre Barbosa, AIWTEC	A Smart Icing Detection System for any Location on the Outer Aircraft Surface **(2019-01-1931)** Thomas Schlegl, Michael Moser, Eologix Sensor Technology GmbH; Theresa Loss, Graz University of Technology; Thomas Unger, Airborne Technologies	Experimental Processing of Methodical Questions of Modeling the Atmospheric Cloud Containing Ice Crystals and Mixed Phase **(2019-01-1922)** Aleksei Goriachev, Vadim Zhulin, Pavel Goriachev, Sergei Grebenkov, Vladimir Savenkov, Central Institute Aviation Motors (CIAM)	Preliminary Results from the In-Cloud ICing and Large-drop Experiment (ICICLE) **(Oral Only)** Ben Bernstein, Leading Edge Atmospherics; Stephanie DiVito, James Riley, Danny Sims, Federal Aviation Administration; Scott Landolt, Julie Haggerty, National Center for Atmospheric Research (NCAR); Mengistu Wolde, National Research Council of Canada; Alexei Korolev, Environment and Climate Change Canada	Microwave Technique for Liquid Water Detection in Icing Applications **(2019-01-1930)** John Leis, David Buttsworth, Ramiz Saeed, Khalid Saleh, University of Southern Queensland; Matthew McGilvray, David Gillespie, University of Oxford
9:30 a.m.	Networking Break				

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TECH SESSIONS

TUESDAY, JUNE 18 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	(Part 1 of 2) Appendix C: Modeling - Ice Accretion & Film (ICE602) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 10:00 a.m. - 12:00 p.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 2 of 2) Aircraft Inflight Icing: Icing Detection Systems (ICE101)** This session describes the development of new HAIC/HIWC instrumentation and testing of these instruments in wind tunnels. 10:00 a.m. - 11:30 a.m. Organizers: Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA Chairperson: Jim Hoppins, Textron Aviation	**(Part 2 of 4) Ice Crystals: Experimental Investigation of Ice Crystal and Mixed Phase Icing (ICE702)** This session includes presentations on recent developments for and tests in NASAs PSL ice crystal test facility. 10:00 a.m. - 11:30 a.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Dave Dischinger, Honeywell Aerospace; Ashlie B. Flegel, NASA John Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Environmental Icing Meteorology and Instruments: New Advances in International Inflight Icing Forecast Systems (ICE403)** This session comprises new advances in International Inflight Icing Forecast Systems. 10:00 a.m. - 12:00 p.m. Organizers: Julie Haggerty, National Center for Atmospheric Research (NCAR); Tina Jurkat, DLR German Aerospace Center; Alexei Korolev, Environment & Climate Change Canada; Christine LeBot, Meteo-France; Philippe Villedieu, ONERA Chairperson: Tina Jurkat, DLR German Aerospace Center	**Test Facilities: Icing Test Capabilities (ICE201)** This session includes presentations on recent ice crystal tests and the facilities for these tests. 10:00 a.m. - 12:00 p.m. Organizers: James MacLeod, National Research Council Canada; Philippe Villedieu, ONERA; Jeanne Mason, Boeing Co. Chairperson: James MacLeod, National Research Council Canada; Jeanne Mason, Boeing Co.
10:00 a.m.	A Shallow Water Type Model to Describe Dynamics of 3D Thin Partially Wetting Films **(Oral Only)** Pierre Trontin, Philippe Villedieu, Julien Lallement, ONERA	The Cloud Detectability Conundrum **(2019-01-1932)** Darren Glenn Jackson, Collins Aerospace	Ice Crystal Icing Test Design and Execution for the ALF502 Vane Segment in the NRC RATFac Cascade Rig **(2019-01-1925)** Dan Fuleki, Martin Neuteboom, Jennifer Chalmers, National Research Council Canada	Development and Evaluation of an Inflight Icing Index for Aviation **(Oral Only)** Katie Brown, Cyril Morcrette, Met Office	Validation of a Small Modular Multi-Stage Axial Compressor for Ice Crystal Icing Research **(2019-01-1940)** Martin Neuteboom, Jennifer Chalmers, National Research Council Canada; Thomas Currie
10:30 a.m.	A Refined In-flight Icing Model and its Numerical Implementation **(2019-01-1937)** Wolfgang Hassler, FH Joanneum GmbH	NRC Particle Detection Probe: Results and Analysis from Ground and Flight Tests **(2019-01-1933)** Craig Davison, Jennifer Chalmers, Dan Fuleki, National Research Council Canada	Experimental Study and Analysis of Ice Crystal Accretion on a Gas Turbine Compressor Stator Vane **(2019-01-1927)** Alexander Bucknell, Matthew McGilvray, David Gillespie, University of Oxford; Liam Parker, University of Queensland; Peter Forsyth, Hassan Saad Ifti, University of Oxford; Geoffrey Jones, Benjamin Collier, Alasdair Reed, Rolls-Royce Plc	Federal Aviation Administration Aviation Weather Research Program Plans for Enhanced Inflight Icing Diagnosis and Forecast Capabilities **(Oral Only)** Danny Sims, Federal Aviation Administration; Julie Haggerty, NCAR; Brian Pettegrew, NOAA Aviation Weather Center	Propulsion Systems Laboratory Customer Guide Update **(Oral Only)** Kyle Zimmerle, HX5 Sierra
11:00 a.m.	Simulations of Thin Film Dynamics on a Flat Plate and an Airfoil **(2019-01-1938)** Jordan Sakakeeny, Stephen T. McClain, Yue Ling, Baylor University	SLD and Ice Crystal Discrimination with the Optical Ice Detector **(2019-01-1934)** Kaare J. Anderson, Mark D. Ray, Collins Aerospace	Ice Crystal Effects on a Hidden Core Turbofan Engine in an Altitude Simulation Icing Facility **(Oral Only)** Ashlie B. Flegel, Michael King, Juan Agui, NASA John Glenn Research Center; Jen-Ching Tsao, Ohio Aerospace Institute; Ru-Ching Chen, NASA John Glenn Research Center	Harmonization and Verification of Three National European Icing Forecast Models using Pilot Reports **(2019-01-1952)** Christoph Knigge, German Weather Service; Katie Brown, Met Office; Christine LeBot, Meteo-France	Development of a Hailstone Subtitute for Representative Impact Tests **(2019-01-1942)** Paul Deconinck, THIOT INGENIERIE
11:30 a.m.	A Penalization Method for 2D Ice Accretion Simulations **(2019-01-1939)** Pierre Lavoie, Ecole Polytechnique Montreal; Ghislain Blanchard, Emmanuel Radenac, ONERA; Eric Laurendeau, Ecole Polytechnique Montreal; Philippe Villedieu, ONERA			Using In-flight Icing Forecasts at the Aviation Weather Center and in the World Area Forecast System to Support Industry Needs **(Oral Only)** Brian Pettegrew, NOAA Aviation Weather Center	Icing Test and Measurement Capabilities of the National Research Council's Gas Turbine Laboratory **(2019-01-1943)** Jennifer Chalmers, Craig Davison, James MacLeod, Martin Neuteboom, Dan Fuleki, National Research Council Canada
12:00 p.m.	Lunch Break				

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TECH SESSIONS

TUESDAY, JUNE 18 - AFTERNOON
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - CFD (ICE603) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 1:00 p.m. - 3:00 p.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**Aircraft Inflight Icing: Fundamental Studies of Melting and Runback Phenomena (ICE102)** This session includes a review of icephobic coatings performance, the development of ice-relaese silicone film adhesives, a JAEA progress summary on the development and evaluation of icephobic coatings - the JEDI ACE project, and the development of a new IPS for aircraft integrated with anti-icing coating - the JEDI ACE project. 2:00 p.m. - 3:00 p.m. Organizers: Jim R. Hoppins, Textron Aviation; Alexandre Laroche, Vittorio Vercillo, Airbus;Philippe Villedieu, ONERA Chairperson: Alexandre Laroche, Airbus	**(Part 3 of 4) Ice Crystals: Experimental Investigation of Ice Crystal and Mixed Phase Icing (ICE702)** This session includes presentations on recent developments for and tests in NASAs PSL ice crystal test facility. 1:30 p.m. - 3:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Dave Dischinger, Honeywell Aerospace; Ashlie B. Flegel, NASA John Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Environmental Icing Meteorology and Instruments: Forecast and Detection of HIWC Areas (ICE403)** This session explores the emerging remote detection and nowcasting capabilities for HAIC/HIWC aloft. 1:30 p.m. - 3:00 p.m. Organizers: Julie Haggerty, National Center for Atmospheric Research (NCAR); Tina Jurkat, DLR German Aerospace Center; Alexei Korolev, Environment & Climate Change Canada; Christine LeBot, Meteo-France; Philippe Villedieu, ONERA Chairperson: Tina Jurkat, DLR German Aerospace Center	**(Part 1 of 2) Test Facilities: Ice Adhesion Tests (ICE203)** This session includes reports on an assessment of multi-element sensor for calibration of wind tunnels, the development of mixed phase and glaciated environments, and the calibration for mixed phase and glaciated icing conditions. 1:30 p.m. - 2:30 p.m. Organizers: James MacLeod, David M. Orchard, National Research Council Canada; Philippe Villedieu, ONERA Chairpersons: David Orchard, National Research Council Canada; Aaron Cusher, Collins Aerospace
1:00 p.m.	Review of Computational Aerodynamics of Lifting Surfaces with Ice Accretion **(Oral Only)** Spencer Stebbins, Eric Loth, University of Virginia				
1:30 p.m.	Ranking of Thick Ice Shapes based on Numerical Simulation for Certification **(2019-01-1944)** Marcus Barth, Johan Degrigny, James Brown, Fatih Tezok, Richard Lewis, Nathalie Alegre, Isaac Barrios-Garcia, Airbus		Particle Size Measurements from the 2018 Honeywell Uncertified Research Engine Test in the NASA Propulsion System Laboratory **(2019-01-1928)** Michael C. King, NASA John Glenn Research Center; Ashlie Flegel, NASA John Glenn Research Center; Julien Manin, Sandia National Laboratories; Darrel Baumgardner, Droplet Measurement Technologies; Timothy Bencic, HX5 Sierra, LLC; Lee Wienkes, Bruce Wilson, Honeywell Aerospace; Ru-Ching Chen, NASA John Glenn Research Center	Recent Updates to the Algorithm for the Prediction of High Ice Water Content Areas (ALPHA) **(Oral Only)** Allyson Rugg, Julie Haggerty, National Center for Atmospheric Research (NCAR); Thomas Ratvasky, NASA John Glenn Research Center; J. Walter Strapp, Met Analytics, Inc.	Characterization of Mode-II Interfacial Fracture Toughness of Ice/Metal Interfaces **(2019-01-1947)** Denizhan Yavas, Ashraf Bastawros, Bishoy Dawood, Christopher Giuffre, Iowa State University
2:00 p.m.	Lattice Boltzmann Simulations of Flow Over an Iced Airfoil **(2019-01-1945)** Rafael Ihi, Andre Ribeiro, Dassault Systemes; Luis Santos, Daniel Silva, Embraer	The Melting Processes of an Ice Bead on a Grooved Silicon Surface **(Oral Only)** Zheyan Jin, Tonji University	Scaling Evaluation of Ice-Crystal Icing on a Modern Turbofan Engine in PSL Using the COMDES-MELT code **(2019-01-1920)** Jen-Ching Tsao, Ohio Aerospace Institute	Development of a Warning Service for High Ice Water Content (HIWC) **(Oral Only)** Rodney Potts, Sue O'Rourke, Australian Bureau of Meteorology; Julie Haggerty, Gary Cunning, National Center for Atmospheric Research (NCAR)	Numerical and Experimental Investigation of Ice Adhesion using the Blister Test **(2019-01-1948)** Christopher Giuffre, Bishoy Dawood, Denizhan Yavas, Ashraf Bastawros, Iowa State University
2:30 p.m.	Separating-reattaching flows over an Iced Airfoil **(2019-01-1946)** Ezgi Oztekin, Diakon Solutions LLC; James Riley, Federal Aviation Administration	An Experimental Study of Wind-Driven Runback of Water Droplets over a Slippery Liquid Infused Porous Surface **(2019-01-1951)** Liqun Ma, Hui Hu, Iowa State University	Ice-Crystal Icing Accretion Studies at the NASA Propulsion Systems Laboratory **(2019-01-1921)** Peter M. Struk, Juan Agui, Thomas Ratvasky, Michael King, NASA John Glenn Research Center; Tadas Bartkus, Jen-Ching Tsao, Ohio Aerospace Institute	Analysis and Automated Detection of Ice Crystal Icing Conditions Using Geostationary Satellite Datasets and In Situ Ice Water Content Measurements **(2019-01-1953)** Kristopher Bedka, Louis Nguyen, NASA Langley Research Center; Christopher Yost, Science Systems and Applications, Inc.; J. Walter Strapp, Met Analytics, Inc.; Thomas Ratvasky, NASA John Glenn Research Center; Konstantin Khlopenkov, Benjamin Scarino, Rajendra Bhatt, Douglas Spangenberg, Rabindra Palikonda, Science Systems and Applications, Inc.	
3:00 p.m.	Networking Break				

TECH SESSIONS

TUESDAY, JUNE 18 - AFTERNOON
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	(Part 2 of 2) Appendix C: Modeling - Ice Accretion & Film (ICE602) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 3:30 p.m. - 5:30 p.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**Icing Certification (ICE501)** This session includes presentations on the development of new icing standards, regulatory activity for certification, and activity for military qualification for flight in icing conditions, especially those associated with ice crystal icing and supercooled large drops. 3:30 p.m. - 5:00 p.m. Organizers: Thomas E. Dwier, Textron Aviation; Robert W. Ray, Ray Engineering; Philippe Villedieu, ONERA Chairperson: Thomas E. Dwier, Textron Aviation	**(Part 4 of 4) Ice Crystals: Experimental Investigation of Ice Crystal and Mixed Phase Icing (ICE702)** This session includes presentations on recent developments for and tests in NASAs PSL ice crystal test facility. 3:30 p.m. - 5:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Dave Dischinger, Honeywell Aerospace; Ashlie B. Flegel, NASA Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Environmental Icing Meteorology and Instruments: Forecast and Detection of Icing Regions (Liquid and Ice Crystal Icing) (ICE403)** This session presents new aspects of forecast methods for the detection of icing regions aloft. (Liquid and Ice Crystal Icing) 3:30 p.m. - 5:00 p.m. Organizers: Julie Haggerty, National Center for Atmospheric Research (NCAR); Tina Jurkat, DLR German Aerospace Center; Alexei Korolev, Environment & Climate Change Canada; Christine LeBot, Meteo-France; Philippe Villedieu, ONERA Chairperson: Christiane Voigt, DLR German Aerospace Center	**(Part 2 of 2) Test Facilities: Ice Adhesion Tests (ICE203)** This session includes reports on an assessment of multi-element sensor for calibration of wind tunnels, the development of mixed phase and glaciated environments, and the calibration for mixed phase and glaciated icing conditions. 3:30 p.m. - 4:30 p.m. Organizers: James MacLeod, David M. Orchard, National Research Council Canada; Philippe Villedieu, ONERA Chairpersons: David Orchard, National Research Council Canada; Aaron Cusher, Collins Aerospace
3:30 p.m.	GlennIce Development and Testing **(Oral Only)** William B. Wright, Vantage Partners Limited; Mark Potapczuk, NASA John Glenn Research Center; David Rigby, Vantage Partners, LLC; Christopher Porter, NASA John Glenn Research Center; Eric Galloway, Vantage Partners, LLC	Four Years of Testing to AS5562 **(2019-01-1957)** Brian D. Matheis, Collins Aerospace; Catherine Clark, National Research Council Canada; Mac Whalen, Collins Aerospace	Total Temperature Measurements in Icing Cloud Flows using a Rearward Facing Probe **(2019-01-1923)** Juan H. Agui, Peter Struk, NASA John Glenn Research Center; Tadas Bartkus, Ohio Aerospace Institute	Toward a Version of the Forecast Icing Product Algorithm for use with the High Resolution Rapid Refresh Numerical Weather Prediction Model **(Oral Only)** Daniel R. Adriaansen, Allyson Rugg, Julie Haggerty, Sarah Tessendorf, George McCabe, Paul Prestopnik, Gary Cunning, National Center for Atmospheric Research (NCAR)	Utilization of Single Cantilever Beam Test for Characterization of Ice Adhesion **(2019-01-1949)** Bishoy Dawood, Denizhan Yavas, Christopher Giuffre, Ashraf Bastawros, Iowa State University
4:00 p.m.	Numerical Simulation of Aircraft and Variable-Pitch Propeller Icing with Explicit Coupling **(2019-01-1954)** Isik Ozcer, Guido S. Baruzzi, Miraj Desai, Maged Yassin, ANSYS Inc.	Flight in Icing Regulatory Evolution and the Influence on Aircraft Design **(2019-01-1958)** David Leopold, Boeing Co.	Numerical Investigation of the NASA Glenn Propulsion Systems Laboratory **(2019-01-1924)** Ioan Feier, U.S. Air Force Academy	Predicting Drop Size for Aircraft Icing Products **(Oral Only)** Sarah Tessendorf, Allyson Rugg, Darcy Jacobson, David Serke, Daniel Adriaansen, Julie Haggerty, National Center for Atmospheric Research (NCAR); Alexei Korolev, Environment & Climate Change Canada	An Equilibrium Measurement of the Thermodynamic Work of Adhesion of Ice and a Silicone Rubber **(Oral Only)** Nathaniel Orndorf, Ali Dhinojwala, University of Akron
4:30 p.m.	Multi-Step Ice Accretion Simulation Using the Level-Set Method **(2019-01-1955)** Yannick Hoarau, Strasbourg University	Airbus View on the Design, Analysis and Testing Capabilities (MOC) as a Robust Integrated Response to Tomorrows Icing Requirements **(Oral Only)** Fatih Tezok, Airbus	Ice Crystal Consortium: Current and Future Perspectives on Ice Crystal Icing Research **Oral Only)** Gilles Aouizerate, SAFRAN Aircraft Engines; Melissa Bravin, Boeing Co.	The Impact of Aerosol Concentration and Droplet Number at Cloud Base on the Region of Ice Initiation in Convective Clouds **(Oral Only)** Tina Jurkat, DLR German Aerospace Center; Christoph Mahnke, Max Planck Institute for Chemistry; Christiane Voigt, DLR German Aerospace Center; Ramon Braga, Instituto Nacional de Pesquisas Espacia; Daniel Rosenfeld, Hebrew Universtity of Jerusalem	
5:00 p.m.	Multi-shot Icing Simulations with Automatic Re-meshing **(2019-01-1956)** Isik Ozcer, David Switchenko, Guido S. Baruzzi, Jian Chen, ANSYS Inc.				

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TECH SESSIONS

WEDNESDAY, JUNE 19 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - Protection Grids & Roughness (ICE604) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 8:00 a.m. - 9:30 a.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 1 of 3) Aircraft Inflight Icing: Icephobic Coatings (ICE102)** This session includes a review of icephobic coatings performance, the development of ice-relaese silicone film adhesives, a JAEA progress summary on the development and evaluation of icephobic coatings - the JEDI ACE project, and the development of a new IPS for aircraft integrated with anti-icing coating - the JEDI ACE project. 8:00 a.m. - 9:30 a.m. Organizers: Jim R. Hoppins, Textron Aviation; Alexandre Laroche, Vittorio Vercillo, Airbus; Philippe Villedieu, ONERA Chairperson: Jim R. Hoppins, Textron Aviation	**(Part 1 of 5) Ice Crystals: Modeling (ICE703)** This session includes presentations on recent developments in ice crystal simulation and modeling. 8:00 a.m. - 9:30 a.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Daniel C. Knezevici, General Electric Co.; Pierre Trontin, Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Environmental Icing Meteorology and Instruments: New Measurement Techniques and Evaluation Methods (ICE401)** This session describes new instruments under development for icing conditions aloft, including supercooled large droplet (SLD) icing conditions. 8:00 a.m. - 9:30 a.m. Organizers: Julie Haggerty, National Center for Atmospheric Research (NCAR); Tina Jurkat, DLR German Aerospace Center; Alexei Korolev, Environment & Climate Change Canada; Christine LeBot, Meteo-France; Philippe Villedieu, ONERA Chairperson: Christiane Voigt, DLR German Aerospace Center	**(Part 1 of 3) Icing of Structures and Aircraft on the Ground: Ground Icing and Deicing of Aircraft (ICE302)** This session covers the ground deicing topics assocaited with runway surfaces. Included are presentations on runway deicers, the damge that runway deicers can cause to aircraft brakes, and the use of microwaves to safely deice runway surfaces. 8:00 a.m. - 9:30 a.m. Organizers: Yvan Chabot, Transport Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
8:00 a.m.	Analysis and Modelling of Icing of Air Intake Protection Grids of Aircraft Engines **(Oral Only)** Vittorio Vercillo, Elmar Bonaccurso, Alexandre Laroche, Norbert Karpen, Airbus	Novel Setup for Measuring Ice Adhesion Strengths in an Icing Wind Tunnel **(Oral Only)** Alexandre Laroche, Vittorio Vercillo, Norbert Karpen, Elmar Bonaccurso, Airbus	Parametric Study of Ice Particles Impacting on a Flat Plate **(Oral Only)** Mario Vargas, Charles Ruggeri, Mike Pereira, Duane Revilock, NASA John Glenn Research Center	How Dual Polarization Technique May Improve Weather Radar on Commercial Aircraft **(2019-01-1982)** Jacques Victor Testud, Emmanuel Moreau, Erwan Le Bouar, NOVIMET	Propulsion Icing Wind Tunnel Research Simulating Ice Pellet Conditions **(2019-01-2043)** Marco Ruggi, APS Aviation Inc.; Antoine Lacroix, Government of Canada
8:30 a.m.	An Assessment of LEWICE Roughness and Convection Enhancement Models **(2019-01-1977)** Timothy Shannon, Stephen T. McClain, Baylor University	Creation of an Icephobic Coating using Graphite Powder and PTFE Nanoparticles **(2019-01-1979)** Joseph Gonzales, Hirotaka Sakaue, University of Notre Dame	Study of Icing in Glaciated and Mixed Conditions **(Oral Only)** Alexey Borisovitch Miller, Central Aerohydrodynamic Institute TsAGI	Wind Tunnel Measurements of Simulated Glaciated Cloud Conditions to Evaluate Newly Developed 2D Imaging Probes **(2019-01-1981)** Biagio M. Esposito, CIRA, Italian Aerospace Research Centre; William D. Bachalo, Artium Technologies Inc.; Delphine Leroy, CNRS; Alfons Schwarzenboeck, LaMP, Laboratoire de Météorologie Physiq; Tina Jurkat, Christiane Voigt, DLR German Aerospace Center; Stephan Bansmer, Technische Universität Braunschweig	Evaluation of Visual Failure versus Aerodynamic Limit for a Snow Contaminated Anti-Iced Wing Section During Simulated Takeoff **(2019-01-1972)** Catherine Clark, National Research Council Canada; Marco Ruggi, APS Aviation Inc.
9:00 a.m.	Equivalent Sand Grain Roughness Correlation for Aircraft Ice Shape Predictions **(2019-01-1978)** Guy Fortin, Bombardier Aerospace	An Experimental Study to Evaluate Hydro-/Ice-Phobic Coatings for Icing Mitigation over Rotating Aero-engine Fan Blades **(2019-01-1980)** Linchuan Tian, Yang Liu, Linkai Li, Hui Hu, Iowa State University	Non-spherical Particle Trajectory Modelling for Ice Crystal Conditions **(2019-01-1961)** Ryan Palmer, University College London; Ian Roberts, Richard Moser, Colin Hatch, AeroTex UK; Frank Smith, University College London	Uncertainty of the Ice Particles Median Mass Diameters Retrieved from the HAIC-HIWC Dataset: a Study of the Influence of the Mass Retrieval Method **(2019-01-1983)** Pierre Coutris, Alfons Schwarzenboeck, CNRS; Delphine Leroy; Alice Grandin, Fabien Dezitter, Airbus; J. Walter Strapp, Met Analytics, Inc.	Type IV Anti-icing Fluid Subjected to Light Freezing Rain: Visual and Thermal Analysis **(2019-01-1971)** Jean-Denis Brassard, Caroline Laforte, Christophe Volat, UQAC - AMIL
9:30 a.m.	Networking Break				

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TECH SESSIONS

WEDNESDAY, JUNE 19 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM			
	Greenway A-C & H-J	Mirage	Greenway DE	Greenway FG
	(Part 2 of 2) Appendix C: SUNSET & Wind Tunnel Testing (ICE601) This session includes presentations on the growing field of wind turbine icing. 10:00 a.m. - 12:00 p.m. Organizers: Fabien Dezitter, Airbus; Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**Aircraft Inflight Icing: Flight Test Campaigns (ICE104)** This session includes the experimental simulations of ice accretion, 2D ice shape scaling evaluation from icing tests, and full-vehicle configurations, and icing certification using aircraft flight test results. 10:00 a.m. - 12:00 p.m. Organizers: Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA; Jason Wright, Bell Helicopter Textron Chairperson: Jason Wright, Bell Helicopter Textron	**(Part 2 of 5) Ice Crystals: Modeling (ICE703)** This session includes presentations on recent developments in ice crystal simulation and modeling. 10:00 a.m. - 12:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Daniel C. Knezevici, General Electric Co.; Pierre Trontin, Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**(Part 2 of 3) Icing of Structures and Aircraft on the Ground: Ground Icing and Deicing of Aircraft (ICE302)** This session covers the ground deicing topics assocaited with runway surfaces. Included are presentations on runway deicers, the damge that runway deicers can cause to aircraft brakes, and the use of microwaves to safely deice runway surfaces. 10:00 a.m. - 11:30 a.m. Organizers: Yvan Chabot, Transport Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
10:00 a.m.	Experimental Aerodynamic Simulation of a Scallop Ice Accretion on a Swept Wing **(2019-01-1984)** Brian Woodard, University of Illinois; Andy Broeren, Mark Potapczuk, NASA John Glenn Research Center; Sam Lee, Vantage Partners Limited; Christopher Lum, Michael Bragg, University of Washington; Timothy Smith, Federal Aviation Administration Technical Center	Facing the Challenges of Supercooled Large Droplet Icing: Results of a Flight Test Based Joint DLR-Embraer Research Project **(2019-01-1988)** Christoph Deiler, Per Ohme, Christian Raab, German Aerospace Center (DLR); Celso Mendonca, Daniel Silva, Embraer	MUSIC-haic - 3D Multidisciplinary Tools for the Simulation of In-flight Icing due to High Altitude Ice Crystals **(2019-01-1962)** Philippe Villedieu, Pierre Trontin, ONERA; Gilles Aouizerate, SAFRAN Aircraft Engines; Stephan Bansmer, Technische Universität Braunschweig; Paolo Vanacore, General Electric Aviation; Ilia Roisman, Cameron Tropea, Darmstadt University of Technology	Frostwing Co-Operation in Aircraft Icing Research **(2019-01-1973)** Pekka Koivisto, Aalto University; Erkki Soinne, Finnish Transport and Communications Agency; Andy Broeren, NASA John Glenn Research Center; Thomas Bond, Federal Aviation Administration
10:30 a.m.	Effects of a Low Fidelity Artificial Scallop Ice Shape on the Aerodynamics and Wake of a Swept-Wing **(Oral Only)** Mohammad Reza Soltani, Michael Bragg, William Yoshida, Christopher Lum, University of Washington; Brian Woodard, University of Illinois	Korean Utility Helicopter KUH-1 Icing Certification Program **(2019-01-1989)** Stefan van 't Hoff, Karel Lammers, Netherlands Aerospace Centre (NLR); Yoo Sang Hwang, Jik Soo Kim, Kyung Sam Kim, Korea Aerospace Industries (KAI)	A Three-Layer Thermodynamic Model for Ice Crystal Accretion on Warm Surfaces: EMM-C **(2019-01-1963)** Alexander Bucknell, Matthew McGilvray, David Gillespie, University of Oxford; Geoffrey Jones, Benjamin Collier, Rolls-Royce Plc	Surface Contamination Effects on CRM Wing Section Model **(2019-01-1976)** Erkki Soinne, Finnish Transport and Communications Agency; Tomi Rosnell, Dimensium Limited
11:00 a.m.	Additional Comparison of Iced Aerodynamic Measurements on a Swept Wing from Two Wind Tunnels **(2019-01-1986)** Sam Lee, Vantage Partners Limited; Andy Broeren, NASA John Glenn Research Center; Brian Woodard, University of Illinois; Christopher Lum, University of Washington; Timothy Smith, Federal Aviation Administration Technical Center	The North Dakota Citation Research Aircraft Measurement Platform **(2019-01-1990)** David Delene, University of North Dakota; Kurt Hibert, Weather Modification International; Michael Poellot, University of North Dakota; Neil Brackin, Weather Modification International	A Continuing Investigation of Diurnal and Location Trends in an Ice Crystal Icing Engine Event Data Base **(2019-01-1964)** Melissa Bravin, Boeing Co.; J. Walter Strapp, Met Analytics, Inc.	Photogrammetric Frost Roughness Measurements in Cold-Soaked Conditions **(2019-01-1970)** Taber Miyauchi, Stephen T. McClain, Tongxin Zhang, Dennis L. O'Neal, Baylor University; James T. Riley, Federal Aviation Administration
11:30 a.m.	Experimental Aerodynamic Simulation of Glaze Ice Accretion on a Swept Wing **(2019-01-1987)** Andy P. Broeren, Mark G. Potapczuk, NASA John Glenn Research Center; Sam Lee, Vantage Partners Limited; Brian S. Woodard, University of Illinois; Michael B. Bragg, University of Washington; Timothy G. Smith, Federal Aviation Administration Technical Center	CH148 Icing Flight Test Performance Data Correlation **(2019-01-1991)** Daniel Griffiths, Sikorsky Aircraft Corporation	Simulation of Ice Particle Breakup and Ingestion into the Honeywell Uncertified Research Engine (HURE) **(2019-01-1965)** David L. Rigby, William Wright, Vantage Partners Limited; Ashlie Flegel, Michael King, NASA John Glenn Research Center	
12:00 p.m.	Lunch Break			

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TECH SESSIONS

WEDNESDAY, JUNE 19 - AFTERNOON
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - Roughness (ICE604) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 1:30 p.m. - 3:00 p.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 2 of 3) Aircraft Inflight Icing: Icephobic Coatings (ICE102)** This session includes a review of icephobic coatings performance, the development of ice-relaese silicone film adhesives, a JAEA progress summary on the development and evaluation of icephobic coatings - the JEDI ACE project, and the development of a new IPS for aircraft integrated with anti-icing coating - the JEDI ACE project. 1:30 p.m. - 3:00 p.m. Organizers: Jim R. Hoppins, Textron Aviation; Alexandre Laroche, Vittorio Vercillo, Airbus; Philippe Villedieu, ONERA Chairperson: Alexandre Laroche, Vittorio Vercillo, Airbus	**(Part 3 of 5) Ice Crystals: Modeling (ICE703)** This session includes presentations on recent developments in ice crystal simulation and modeling. 1:30 p.m. - 3:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Daniel C. Knezevici, General Electric Co.; Pierre Trontin, Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**(Part 1 of 2) Supercooled Large Drops (SLD): SLD Icing Modeling (ICE803)** This session includes presentations on recent developments in the use of computational fluid dynamics (CFD) for the prediction of the effects of large drop (SLD) icing conditions. 1:30 p.m. - 3:00 p.m. Organizers: Shezad Nilamdeen, ANSYS Inc.; Mark G. Potapczuk, NASA John Glenn Research Center; Alberto Pueyo, Bombardier; Philippe Villedieu, ONERA Chairperson: Mark G. Potapczuk, NASA John Glenn Research Center	**(Part 3 of 3) Icing of Structures and Aircraft on the Ground: Ground Icing and Deicing of Aircraft (ICE302)** This session covers the ground deicing topics assocaited with runway surfaces. Included are presentations on runway deicers, the damge that runway deicers can cause to aircraft brakes, and the use of microwaves to safely deice runway surfaces. 1:30 p.m. - 2:30 p.m. Organizers: Yvan Chabot, Transport Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
1:30 p.m.	Effect of Increasing Roughness on the Wall Friction Coefficient and the Heat Transfer **(Oral Only)** Philippe Reulet, Olivier Leon, François Chedevergne, ONERA	Review of the Icephobic Properties of Laser-Treated Superhydrophobic Surfaces **(Oral Only)** Vittorio Vercillo, Simone Tonnicchia, Norbert Karpen, Alexandre Laroche, Elmar Bonaccurso, Airbus	Two-way Flow Coupling in Ice Crystal Icing Simulation **(2019-01-1966)** Jonathan Paul Connolly, University of Oxford; Geoffrey Jones, Rolls-Royce Plc; Alex Bucknell, Liam Parker, Matthew McGilvray, David Gillespie, University of Oxford; Benjamin Collier, Rolls-Royce Plc	Description and Overview of the ICE GENESIS Research Project **(Oral Only)** Florent Huet	Runway Deicing Product Anti/Deicing Performance Assessment: Review and Future Directions **(2019-01-1974)** Jean-Denis Brassard, Caroline Laforte, Marc Mario Tremblay, Christophe Volat, UQAC - AMIL
2:00 p.m.	Validation of Ice Roughness Analysis based on 3D-Scanning and Self-Organizing Maps **(2019-01-1992)** Thomas Neubauer, David Kozomara, Austrian Institute for Icing Sciences; Reinhard Puffing, Wolfgang Hassler, FH Joanneum GmbH	Testing of Elastomer Icephobic Coatings in the AIWT: Lessons Learned **(2019-01-1994)** David Orchard, National Research Council Canada; Gislain Chevrette, Damien Maillard, Lolei Khoun, National Research Council	Semi-Empirical Modelling of Erosion Phenomena for Ice Crystal Icing Numerical Simulation **(2019-01-1967)** Virgile Charton, Pierre Trontin, ONERA; Gilles Aouizerate, SAFRAN Aircraft Engines; Philippe Villedieu, ONERA	A Study of Droplet Breakup in the Vicinity of an Airfoil **(2019-01-2000)** Suthyvann Sor, Adelaida Garcia-Magariño, INTA; Angel Velazquez, UPM	On-Ground Cold Soak Fuel Frost Modeling **(2019-01-1975)** Daniel Martins da Silva, Luis Santos, André Katchborian, Rodrigo Sousa, Embraer
2:30 p.m.	Influence of Freestream Temperature on Ice Accretion Roughness **(2019-01-1993)** Stephen T. McClain, Baylor University; Mario Vargas, NASA John Glenn Research Center; Jen-Ching Tsao, Ohio Aerospace Institute; Andy Broeren, NASA John Glenn Research Center	An Explorative Study to Use Super-Hydrophilic/Super-Hydrophobic Hybrid Surfaces for Aircraft Icing Mitigation **(2019-01-1995)** Haiyang Hu, Hui Hu, Yang Liu, Iowa State University	ICICLE: A Model for Glaciated & Mixed Phase Icing for Application to Aircraft Engines **(2019-01-1969)** Alexander Bucknell, Matthew McGilvray, David Gillespie, Xin Yang, University of Oxford; Geoffrey Jones, Benjamin Collier, Rolls-Royce Plc	Focus on Challenges in SLD Regime: Reemitted Droplets Models **(2019-01-2001)** Francois Caminade, Loïc Frazza, Dassault Aviation	
3:00 p.m.	Networking Break				

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TECH SESSIONS

WEDNESDAY, JUNE 19 - AFTERNOON Technical and Business Sessions			
TIME	SESSION TITLE, DESCRIPTION, AND ROOM		
	Greenway A-C & H-J	Mirage	Regency
	Appendix C: Modeling - Ice Protection & Shedding (ICE605) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 3:30 p.m. - 5:30 p.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 3 of 3) Aircraft Inflight Icing: Icephobic Coatings (ICE102)** This session includes a review of icephobic coatings performance, the development of ice-relaese silicone film adhesives, a JAEA progress summary on the development and evaluation of icephobic coatings - the JEDI ACE project, and the development of a new IPS for aircraft integrated with anti-icing coating - the JEDI ACE project. 3:00 p.m. - 5:00 p.m. Organizers: Jim R. Hoppins, Textron Aviation; Alexandre Laroche, Vittorio Vercillo, Airbus; Philippe Villedieu, ONERA Chairperson: Alexandre Laroche, Vittorio Vercillo, Airbus	**(Part 2 of 2) Supercooled Large Drops (SLD): SLD Icing Modeling (ICE803)** This session includes presentations on recent developments in the use of computational fluid dynamics (CFD) for the prediction of the effects of large drop (SLD) icing conditions. 3:30 p.m. - 5:00 p.m. Organizers: Shezad Nilamdeen, ANSYS Inc.; Mark G. Potapczuk, NASA John Glenn Research Center; Alberto Pueyo, Bombardier; Philippe Villedieu, ONERA Chairperson: Mark G. Potapczuk, NASA John Glenn Research Center
3:30 p.m.	An Approach for Modelling Ice Shedding: Numerical Development and Test Comparison **(Oral Only)** Bruno Bernay, SONACA sa	Advanced Nanocomposite Low Adhesion Icephobic Coating for Aerospace Applications **(2019-01-1996)** Vinod Veedu, Sumil Thapa, Ganesh Kumar Arumugam, Oceanit Laboratories Inc.	Numerical Modelling of Primary and Secondary Effects of SLD Impingement **(2019-01-2002)** Habibollah Fouladi, Guido S. Baruzzi, Shezad Nilamdeen, Isik Ozcer, ANSYS Inc.
4:00 p.m.	Numerical Simulation of Ice Shedding from Rotating Components **(2019-01-2003)** Shezad Nilamdeen, Yue Zhang, Isik Ozcer, Guido S. Baruzzi, ANSYS Inc.	An Experimental Study to Evaluate the Droplet Impinging Erosion Characteristics of an Icephobic, Elastic Soft Surface **(2019-01-1997)** Liqun Ma, Zichen Zhang, Yang Liu, Hui Hu, Iowa State University	Calculation-Experimental Research on Methodical Issues of Providing Tests of Aviation Technology Elements in SLD Conditions at High Flow Speeds **(Oral Only)** Goriachev Aleksei, Zhulin Vadim, Goriachev Pavel, Grebenkov Sergei, Savenkov Vladimir, Central Institute of Aviation Motor
4:30 p.m.	Numerical Investigation of Electrothermal De-icing Process on Composite Airfoil **(Oral Only)** Xiaofeng Guo, Zhiqiang Guo, Wei Dong, Shanghai Jiao Tong University	Measured Interfacial Residual Strains Produced by In-Flight Ice **(2019-01-1998)** Andrew Work, Ohio Aerospace Institute; Jonathan Salem, NASA John Glenn Research Center; Eric Baker, Connecticut Reserve Technologies; Ernestina Schirmer, Purdue University; Rebekah Douglass, Penn State University; Richard Kreeger, NASA John Glenn Research Center	Calculation-Experimental Research on Methodical Issues of Ice Protection Efficiency Estimation of Planers Elements from the Impact of SLC Atmospheric Conditions **(Oral Only)** Goriachev Aleksei, Zhulin Vadim, Goriachev Pavel, Grebenkov Sergei, Savenkov Vladimir, Central Institute of Aviation Motor
5:00 p.m.	Experimental and Computer Model Results for a Carbon Nanotubes Electrothermal De-Icing System **(2019-01-2005)** Rodrigo Domingos, Gilberto Becker, Embraer		

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TECH SESSIONS

THURSDAY, JUNE 20 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - Droplet Trajectory (ICE606) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 8:00 a.m. - 9:30 a.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**(Part 1 of 3) Aircraft Inflight Icing: Thermal Ice Protection Systems (ICE103)** This session includes an experimental study of altitude effect on thermal IPS performance, an analysis of thermal ice protection of restraining grids on aircraft, an unsteady thermal simulation of aircraft wing IPS integrated in metallic or composite structures, and an update on recent advances in the GlennIce icing model. 8:00 a.m. - 9:30 a.m. Organizers: Roger J. Aubert, Bell Flight; Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA Chairperson: Roger J. Aubert, Bell Flight	**(Part 4 of 5) Ice Crystals: Modeling (ICE703)** This session includes presentations on recent developments in ice crystal simulation and modeling. 8:00 a.m. - 9:30 a.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Daniel C. Knezevici, General Electric Co.; Pierre Trontin, Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**Supercooled Large Drops (SLD): Wind Tunnel Experimentations in SLD Icing Conditions (ICE802)** This session includes presentations on recent supercooled large drop (SLD) test programs. 8:00 a.m. - 9:30 a.m. Organizers: Laura E. King-Steen, HX5 Sierra; Mark G. Potapczuk, NASA John Glenn Research Center; Alberto Pueyo, Bombardier Inc.; Philippe Villedieu, ONERA Chairperson: Alberto Pueyo, Bombardier	**Icing of Structures and Aircraft on the Ground: Ground Icing of Power Lines and Cables (ICE303)** This session includes papers for a wide range of topics from the protection of wind turbines from the effects of ice accretion, the deicing of ships and ground and structures, the effects of ground fog at cold temperatures, and regulations for the use of deicing fluids and chemicals. Icing papers for topics that do not fit in the other three sessions are invited to submit in this session. 8:00 a.m. - 9:30 a.m. Organizers: Brian W. Burkitt, Nusil Technology; Yvan Chabot, Transport Canada; Antoine Lacroix, Government of Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
8:00 a.m.	Motivation, Development and Verification of a Rapid 3D Lagrangian Impingement Code Trajectory and Catch 3D+ (TAC3D+) **(2019-01-2011)** Ian Roberts, AeroTex UK	A Full Ice Protection System for a 4.6 Ton Helicopter **(Oral Only)** Enrico Bellussi, Leonardo Helicopters	Numerical Demonstration of the Humidity Effect in Engine Icing **(2019-01-2015)** Yue Zhang, Isik Ozcer, Shezad Nilamdeen, Guido S. Baruzzi, Jeyatharsan Selvanayagam, ANSYS Inc.	Development of a Tool for the Design of an Icing Wind Tunnel Facility for SLD Condition Simulation in a Vertical Test Section **(Oral Only)** Andreas Tramposch, Reinhard Puffing, Wolfgang Hassler, FH Joanneum GmbH	An Experimental Study on the Dynamic Ice Accretion Processes on Bridge Cable Models with Different Surface Modifications **(2019-01-2018)** Yang Liu, Yihua Peng, Iowa State University; Wenli Chen, Harbin Institute of Technology; Hui Hu, Iowa State University
8:30 a.m.	An Eulerian Approach with Mesh Adaptation for High Accurate 3D Droplets Dynamics Simulations **(2019-01-2012)** Alberto Pueyo, Bombardier; Isik Ozcer, Guido Baruzzi, ANSYS Inc.	The EU CleanSky 2 InSPIRe Project: An Innovative Wing Ice Protection System for the Leonardo Regional Aircraft Concept **(Oral Only)** Alessandro Zanon, Helmut Kuehnelt, Michele De Gennaro, Austrian Institute of Technology; Richard Moser, Ian Roberts, AeroTex UK LLP; Markus Villinger, Villinger GmbH	Numerical Simulation of Ice Crystal Accretion Inside a Turbofan Core Stator **(2019-01-2017)** Shezad Nilamdeen, Vinod Singh Rao, David Switchenko, Jeyatharsan Selvanayagam, Isik Ozcer, Guido S. Baruzzi, ANSYS Inc.	Aerodynamic Comparison of Freezing Rain and Freezing Drizzle Conditions at the RTA Icing Wind Tunnel **(2019-01-2023)** Wolfgang Breitfuß, Michael Wannemacher, Florian Knöbl, Hermann Ferschitz, RTA	An Experimental Study of Atmospheric Icing Process on Power Transmission Line **(2019-01-2019)** Ramsankar Veerakumar, Linyue Gao, Yang Liu, Hui Hu, Iowa State University
9:00 a.m.	Extension of a 2D Algorithm for Catch Efficiency Calculation to Three Dimensions **(2019-01-2013)** Christian Bartels, Airbus; Thomas Neubauer, Wolfgang Hassler, FH Joanneum GmbH	Aero-Engine Inlet Vane Structure Optimization for Anti-Icing with Hot Air Film using Neural Network and Genetic Algorithm **(2019-01-2021)** Jie Liu, Peng Ke, Beihang University	Partially Melted Cloud Ice Accretion Modeling and Experimental Verification **(Oral Only)** Sihong Yan, Jose Palacios, Penn State University	The Influence of SLD Drop Size Distributions on Ice Accretion in the NASA Icing Research Tunnel **(2019-01-2022)** Mark G. Potapczuk, NASA John Glenn Research Center; Jen-Ching Tsao, Ohio Aerospace Institute	Ice Nucleation in the Presence of Electric Fields: An Experimental Study **(2019-01-2020)** Jens-Michael Löwe, TU Darmstadt, High-Voltage Laboratories; Markus Schremb, TU Darmstadt, SLA; Volker Hinrichsen, TU Darmstadt, High-Voltage Laboratories; Cameron Tropea, TU Darmstadt, SLA
9:30 a.m.	Networking Break				

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TECH SESSIONS

THURSDAY, JUNE 20 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - Applications (ICE607) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 10:00 a.m. - 11:30 a.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**Aircraft Inflight Icing: Innovative Ice Protection Systems (ICE103)** This session includes an experimental study of altitude effect on thermal IPS performance, an analysis of thermal ice protection of restraining grids on aircraft, an unsteady thermal simulation of aircraft wing IPS integrated in metallic or composite structures, and an update on recent advances in the GlennIce icing model. 10:00 a.m. - 12:00 p.m. Organizers: Roger J. Aubert, Bell Flight; Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA; Jason Wright, Bell Helicopter Textron Chairperson: Jason Wright, Bell Helicopter Textron	**Ice Crystals: Flight Test Characterization of Ice Crystal Icing Conditions (ICE701)** This session includes a study of App. C ice roughness characterization using laser scanning, with realistic ice roughness fields under different icing conditions, and numerical modeling of local air flow over realistic ice roughness fields from laser scanning. 10:00 a.m. - 12:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Melissa Bravin, Boeing Co.; Thomas Ratvasky, NASA John Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**(Part 1 of 3) Supercooled Large Drops (SLD): Advanced Instrumentation for SLD Icing Conditions (ICE801)** This session describes new instruments under development for icing conditions aloft, including supercooled large drop (SLD) icing conditions. 10:00 a.m. - 11:30 a.m. Organizers: Alberto Pueyo, Bombardier; Judith Foss Van Zante, NASA John Glenn Research Center; Philippe Villedieu, ONERA; Biagio M. Esposito, CIRA Scpa; Mark G. Potapczuk, NASA John Glenn Research Center Chairperson: Judith Van Zante, NASA	**Icing of Structures and Aircraft on the Ground: Ground Icing of Wind Turbines (ICE303)** This session includes papers for a wide range of topics from the protection of wind turbines from the effects of ice accretion, the deicing of ships and ground and structures, the effects of ground fog at cold temperatures, and regulations for the use of deicing fluids and chemicals. Icing papers for topics that do not fit in the other three sessions are invited to submit in this session. 10:00 a.m. - 11:30 a.m. Organizers: Brian W. Burkitt, Nusil Technology; Yvan Chabot, Transport Canada; Antoine Lacroix, Government of Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
10:00 a.m.	The Design Method of Ice Tolerable Wing **(Oral Only)** Haoran Li; Yufei Zhang, Tsinghua University; Chen Haixin	Development of an Impulsive-Pneumatic Deicing System **(Oral Only)** Jose Palacios, Carter M. Forry, Penn State University	Summary of the High Ice Water Content (HIWC) RADAR Flight Campaigns **(2019-01-2027)** Thomas Ratvasky, NASA John Glenn Research Center; Steven Harrah, Fred Proctor, Kristopher Bedka, Glenn Diskin, John B. Nowak, NASA Langley Research Center; J. Walter Strapp, Met Analytics, Inc., Inc.; Lyle Lilie, Science Engineering Associates, Inc.; Justin Strickland, Patricia Hunt, AMA-NASA Langley Research Center; T. P. Bui, NASA Ames Research Center; Aaron Bansemer, National Center for Atmospheric Research (NCAR); Christopher Dumont, FAA William J. Hughes Technical Center	Global Temperature Mapping and Crystallization Analysis of a Supercooled Water Droplet Impact Icing using Luminescent Imaging Technique **(2019-01-2009)** Wesley Chad Patterson, Hirotaka Sakaue, University of Notre Dame	A Novel Heating-Coating Hybrid Strategy for Wind Turbine Icing Mitigation **(2019-01-2029)** Linyue Gao, Liqun Ma, Yang Liu, Hui Hu, Iowa State University
10:30 a.m.	The Effect of Crosswinds on Icing at Turbofan Engine Inlet **(2019-01-2024)** Qian Yang, Zhiqiang Guo, Mei Zheng, Wei Dong, Shanghai Jiao Tong University	Numerical Simulation of Electromechanical Resonant De-icing Systems **(Oral Only)** Alexis Marboeuf, ONERA, ICA; Lokman Bennani, ONERA; Marc Budinger, Universite de Toulouse; Valérie POMMIER-BUDINGER, ISAE-SUPAERO	Comparisons of Cloud In-Situ Microphysical Properties of Deep Convective Clouds to Appendix D/P using Data from the HAIC-HIWC and HIWC-RADAR Flight Campaigns. **(Oral Only)** J. Walter Strapp, Met Analytics, Inc.; Delphine Leroy, CNRS-LaMP; Thomas Ratvasky, NASA John Glenn Research Center; Kristopher Bedka, Steven Harrah, NASA Langley Research Center; Julien Delanoe, CNRS-LATMOS; Mengistu Wolde, National Research Council; Thomas Bond, Federal Aviation Adminstration; Alain Protat, Australian Bureau of Meteorology; James Riley, Federal Aviation Administration; Matthew Grzych, Boeing Co.; Fabien Dezitter, Airbus; Alfons Schwarzenboeck, CNRS-LaMP; Alice Grandin, Airbus; Rodney Potts, Australian Bureau of Meteorology; Lyle Lilie, Science Engineering Associates Inc; Alexei Korolev, Environment & Climate Change Canada	Development of A Novel Digital Image Projection (DIP) Technique to Quantify the Dynamic Impinging Process of Water Droplets Pertinent to SLD Icing Phenomena **(Oral Only)** Hui Hu, Iowa State University	Quantification of 3D Ice Structures Accreted on a Wind Turbine Airfoil Model **(2019-01-2030)** Linyue Gao, Ramsankar Veerakumar, Yang Liu, Hui Hu, Iowa State University

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TECH SESSIONS

THURSDAY, JUNE 20 - MORNING
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM				
	Greenway A-C & H-J	Mirage	Greenway DE	Regency	Greenway FG
	Appendix C: Modeling - Applications (ICE607) This session includes a numerical improvement of 2D ice accretion simulation capability, including roughness, accretion, 3D ice shapes, shedding, and runback by exploring the 14 CFR 25/29 Appendix C icing envelope. 10:00 a.m. - 11:30 a.m. Organizers: Fabien Dezitter, Airbus; Emmanuel Radenac, Philippe Villedieu, ONERA Chairperson: Fabien Dezitter, Airbus	**Aircraft Inflight Icing: Innovative Ice Protection Systems (ICE103)** This session includes an experimental study of altitude effect on thermal IPS performance, an analysis of thermal ice protection of restraining grids on aircraft, an unsteady thermal simulation of aircraft wing IPS integrated in metallic or composite structures, and an update on recent advances in the GlennIce icing model. 10:00 a.m. - 12:00 p.m. Organizers: Roger J. Aubert, Bell Flight; Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA; Jason Wright, Bell Helicopter Textron Chairperson: Jason Wright, Bell Helicopter Textron	**Ice Crystals: Flight Test Characterization of Ice Crystal Icing Conditions (ICE701)** This session includes a study of App. C ice roughness characterization using laser scanning, with realistic ice roughness fields under different icing conditions, and numerical modeling of local air flow over realistic ice roughness fields from laser scanning. 10:00 a.m. - 12:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Melissa Bravin, Boeing Co.; Thomas Ratvasky, NASA John Glenn Research Center; Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**(Part 1 of 3) Supercooled Large Drops (SLD): Advanced Instrumentation for SLD Icing Conditions (ICE801)** This session describes new instruments under development for icing conditions aloft, including supercooled large drop (SLD) icing conditions. 10:00 a.m. - 11:30 a.m. Organizers: Alberto Pueyo, Bombardier; Judith Foss Van Zante, NASA John Glenn Research Center; Philippe Villedieu, ONERA; Biagio M. Esposito, CIRA Scpa; Mark G. Potapczuk, NASA John Glenn Research Center Chairperson: Judith Van Zante, NASA	**Icing of Structures and Aircraft on the Ground: Ground Icing of Wind Turbines (ICE303)** This session includes papers for a wide range of topics from the protection of wind turbines from the effects of ice accretion, the deicing of ships and ground and structures, the effects of ground fog at cold temperatures, and regulations for the use of deicing fluids and chemicals. Icing papers for topics that do not fit in the other three sessions are invited to submit in this session. 10:00 a.m. - 11:30 a.m. Organizers: Brian W. Burkitt, Nusil Technology; Yvan Chabot, Transport Canada; Antoine Lacroix, Government of Canada; Philippe Villedieu, ONERA Chairperson: Yvan Chabot, Transport Canada
11:00 a.m.	Predicted Ice Shape Formations on a Boundary Layer Ingesting Engine Inlet **(2019-01-2025)** Christopher Porter, NASA Glenn Research Center	Electromechanical Resonant Ice protection Systems: How to Favour Fractures Propagation **(2019-01-2032)** Pierrick Rouset, Valérie Pommier-Budinger, ISAE-SUPAERO; Marc Budinger, INSA Toulouse	Radar Detection of High Concentrations of Ice Particles - Methodology and Preliminary Flight Test Results **(2019-01-2028)** Steven Harrah, Fred Proctor, NASA Langley Research Center; Justin Strickland, Patricia Hunt, George Switzer, AMA - NASA Langley Research Center; Thomas Ratvasky, NASA John Glenn Research Center; J. Walter Strapp, Met Analytics, Inc.; Lyle Lilie, Science Engineering Associates Inc; Christopher Dumont, Federal Aviation Administration	Experimental Investigation of High Speed SLD Impact **(2019-01-2006)** Virginel BODOC, Pierre Berthoumieu, ONERA	A Parametric Study on the Thermodynamic Characteristics of DBD Plasma Actuation and Its Potential for Wind Turbine Icing Mitigation **(2019-01-2031)** Cem Kolbakir, Linyue Gao, Yang Liu, Hui Hu, Iowa State University
11:30 a.m.		An Experimental Study on the Effects of DBD Plasma Actuation Layout on its Anti-/De-Icing Performance for Aircraft Icing Mitigation **(2019-01-2033)** Cem Kolbakir, Yang Liu, Haiyang Hu, Hui Hu, Iowa State University	High Altitude Ice Crystal Detection with Aircraft X-band Weather Radar **(2019-01-2026)** Jan Lukas, Pavel Badin, Honeywell Aerospace		
12:00 p.m.	Lunch Break				

For more program details, please go to sae.org/icing or the Icing Mobile App.

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TECH SESSIONS

THURSDAY, JUNE 20 - AFTERNOON
Technical and Business Sessions

TIME	SESSION TITLE, DESCRIPTION, AND ROOM			
	Mirage	Greenway DE	Regency	Greenway FG
	(Part 2 of 3) Aircraft Inflight Icing: Thermal Ice Protection Systems (ICE103) This session includes an experimental study of altitude effect on thermal IPS performance, an analysis of thermal ice protection of restraining grids on aircraft, an unsteady thermal simulation of aircraft wing IPS integrated in metallic or composite structures, and an update on recent advances in the Glennlce icing model. 2:00 p.m. - 3:00 p.m. Organizers: Roger J. Aubert, Bell Flight; Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA Chairperson: Roger J. Aubert, Bell Flight	**(Part 5 of 5) Ice Crystals: Modeling (ICE703)** This session includes presentations on recent developments in ice crystal simulation and modeling. 1:30 p.m. - 3:00 p.m. Organizers: Gilles Aouizerate, SAFRAN Aircraft Engines; Daniel C. Knezevici, General Electric Co.; Pierre Trontin, Philippe Villedieu, ONERA Chairperson: Gilles Aouizerate, SAFRAN Aircraft Engines	**(Part 2 of 3) Supercooled Large Drops (SLD): Advanced Instrumentation for SLD Icing Conditions (ICE801)** This session describes new instruments under development for icing conditions aloft, including supercooled large drop (SLD) icing conditions. 1:30 p.m. - 3:00 p.m. Organizers: Alberto Pueyo, Bombardier; Judith Foss Van Zante, NASA John Glenn Research Center; Philippe Villedieu, ONERA; Biagio M. Esposito, CIRA Scpa; Mark G. Potapczuk, NASA John Glenn Research Center Chairperson: Judith Van Zante, NASA	**(Part 1 of 2) UAV Icing (ICE900)** This session includes presentations on regulatory activity for certification and for qualification for flight in icing conditions, especially those associated with ice crystal icing and supercooled large drops. 1:30 p.m. - 3:00 p.m. Organizers: Dennis Regnier, CAV Ice Protection; Philippe Villedieu, ONERA Chairperson: Dennis Regnier, CAV Ice Protection
1:30 p.m.		Event-Driven Simulation of Particle-Particle and Particle-Surface Collisions in Ice Crystal Icing **(2019-01-2014)** Thomas Charles Currie, ICI Physics	Overview of an SLD Instrumentation Test Effort **(Oral Only)** Judith Foss Van Zante, NASA; J. Walter Strapp, Met Analytics; James Riley, Federal Aviation Administration; David Orchard, National Research Council Canada; Biagio Esposito, CIRA Scpa	Performance Evaluation of Multi-rotor Unmanned Aerial Vehicles in Icing Environment **(Oral Only)** Sihong Yan, Jose Palacios, Penn State University
2:00 p.m.	Computational Simulation of an Electrically Heated Ice Protection System for Composite Leading Edges of Aircraft **(2019-01-2041)** Prince Raj Lawrence Raj, Hojin Jeong, Rene Roy, Jin-Hwe Kweon, Rho Shin Myong, Gyeongsang National University	Analysis of Experimental Ice Accretion Data and Assessment of a Thermodynamic Model During Ice Crystal Icing **(2019-01-2016)** Tadas P. Bartkus, Jen-Ching Tsao, Ohio Aerospace Institute; Peter M. Struk, NASA John Glenn Research Center	Characterization of SLD and Mixed-Phase Cloud Conditions Using the Advanced Phase Doppler Method **(Oral Only)** Biagio M. Esposito, CIRA Scpa; Gislain Chevrette, National Research Council Canada; William Bachalo, Artium Technologies Inc; Laura King-Steen, HX5 Sierra; David Orchard, National Research Council Canada; Stephan Bansmer, Technische Universität Braunschweig; Alexei Korolev, Environment & Climate Change Canada; Judith Van Zante, NASA	Droplet Impingement Analysis in IM Condition for UAV Ice Detector Placement **(Oral Only)** Sung Soon Park, Kyoung Jin Jung, ADD; Sung Ho Ko, Chungnam National University
2:30 p.m.	Numerical Optimisation of a Helicopter Engine Inlet Electrothermal Ice Protection System **(2019-01-2042)** Richard Moser, Ian Roberts, AeroTex UK	Material Properties of Granular Ice Layers Characterized Using a Rigid-Body-Penetration Method: Experiments and Modeling **(2019-01-2034)** Markus Schremb, Kenan Malicevic, Louis Reitter, Ilia Roisman, Cameron Tropea, Technical University of Darmstadt	Measurement of Particle Size Distribution for Supercooled Large Drop conditions in the NRCs Altitude Icing Wind Tunnel **(Oral Only)** David M. Orchard, Catherine Clark, Gislain Chevrette, National Research Council Canada	An Experimental Study of A Drone Propeller Operating Under Icing Conditions **(Oral Only)** Zhe Ning, Yang Liu, Nianhong Han, Hui Hu, Iowa State University; Ma Hongwei, Beihang University
3:00 p.m.	Networking Break			

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TECH SESSIONS

THURSDAY, JUNE 20 - AFTERNOON Technical and Business Sessions			
TIME	**SESSION TITLE, DESCRIPTION, AND ROOM**		
	Mirage	Regency	Greenway FG
	(Part 3 of 3) Aircraft Inflight Icing: Thermal Ice Protection Systems (ICE103) This session includes an experimental study of altitude effect on thermal IPS performance, an analysis of thermal ice protection of restraining grids on aircraft, an unsteady thermal simulation of aircraft wing IPS integrated in metallic or composite structures, and an update on recent advances in the Glennlce icing model. 3:30 p.m. - 4:30 p.m. Organizers: Roger J. Aubert, Bell Flight; Jim R. Hoppins, Textron Aviation; Philippe Villedieu, ONERA Chairperson: Roger J. Aubert, Bell Flight	**(Part 3 of 3) Supercooled Large Drops (SLD): Advanced Instrumentation for SLD Icing Conditions (ICE801)** This session describes new instruments under development for icing conditions aloft, including supercooled large drop (SLD) icing conditions. 3:30 p.m. - 4:30 p.m. Organizers: Alberto Pueyo, Bombardier; Judith Foss Van Zante, NASA John Glenn Research Center; Philippe Villedieu, ONERA; Biagio M. Esposito, CIRA Scpa; Mark G. Potapczuk, NASA John Glenn Research Center Chairperson: Judith Van Zante, NASA	**(Part 2 of 2) UAV Icing (ICE900)** This session includes presentations on regulatory activity for certification and for qualification for flight in icing conditions, especially those associated with ice crystal icing and supercooled large drops. 3:30 p.m. - 4:30 p.m. Organizers: Dennis Regnier, CAV Ice Protection; Philippe Villedieu, ONERA Chairperson: Dennis Regnier, CAV Ice Protection
3:30 p.m.	Heat Transfer Enhancement in Stagnation Region of Aero-engine Inlet Vanes due to Ejection Slot and Anisotropic Heat Conduction **(2019-01-2040)** Peng Ke, Jie Liu, Lukas Schaeflein, Beihang University; Kun Yang, Hongkui Zhou, AECC Commercial Aircraft Engine Co., Ltd	Measurement of Liquid Water Content for Supercooled Large Drop conditions in the NRCs Altitude Icing Wind Tunnel **(2019-01-2007)** David M. Orchard, Catherine Clark, Gislain Chevrette, National Research Council Canada	UAV Icing: Ice Accretion Experiments and Validation **(2019-01-2037)** Richard Hann, Norwegian University of Science and Technology (NTNU)
4:00 p.m.	An Experimental Study of a Hot-air-based Anti-/De-icing System for Icing Protection of Aero-engine Inlet Guide Vanes **(2019-01-2039)** Linkai Li, Linchuan Tian, Yang Liu, Hui Hu, Iowa State University; Xuejun Liu, United Technologies Pratt and Whitney; Isaac Hogate, Pratt & Whitney; Atul Kohli, United Technologies Pratt and Whitney	Upgrade of CIRA-HSI for Instrumentation Inter-comparison Testing Under SLD Cloud Conditions **(Oral Only)** Biagio M. Esposito, CIRA Scpa; Laura King-Steen, HX5 Sierra; J. Walter Strapp, Met Analytics, Inc.; William Bachalo, Artium Technologies Inc; Alexei Korolev, Environment & Climate Change Canada; Judith Van Zante, NASA	Experimental Investigations of an Icing Protection System for UAVs **(2019-01-2038)** Richard Hann, Kasper Borup, Artur Zolich, Norwegian University of Science and Technology (NTNU); Kim Sorensen, UBIQ Aerospace; Håvard Vestad, Martin Steinert, Tor Johansen, Norwegian University of Science and Technology (NTNU)
4:30 p.m.	RISP – Rotor Ice Shed Prevention: A New Technology to Prevent from Hazardous Ballistic Ice Shedding from Rotors **(Oral Only)** Markus Villinger, Villinger GmbH		

For more program details, please go to sae.org/icing or the Icing Mobile App.

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PARTICIPANTS INDEX

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CALL FOR PAPERS/PRESENTATIONS

AeroTech Americas 2020

March 17-19, 2020 | Pasadena, CA

To submit an abstract please visit sae.org/aerotechus/.

The SAE AeroTech provides a forum for the global aerospace community to meet and discuss current and future challenges, opportunities, and requirements of R&D, products, and systems. Technical sessions, panel discussions, and keynote presentations make up a program that provides value to the entire technical community, including engineers, scientists, designers, managers, and academia. The technical program will cover a broad spectrum of topics including from nose to tail, concept to sustainment. AeroTech also provides a venue for engineers participating on SAE committees and advisory bodies to meet and discuss industry standardization efforts and best practices. The event also provides opportunities for networking and personal discussion with other industry experts through networking breaks, exhibits, awards luncheon, and receptions.

Topics Under Consideration

- Aerospace Operations
- Auto Fastening / Assembly & Tooling
- Aviation Cyber-Physical Security
- Avionics
- Business/Economics
- Environment
- Flight Engineering
- Integrated Vehicle Health Management
- Maintenance, Repair and Overhaul
- Manufacturing/Materials/Structures
- Propulsion
- Power and Thermal Systems
- Safety
- Unmanned Aerial Systems
- Vehicle Systems / Systems Engineering

Emerging Topics

- (More) Electric Aircraft
- Additive Manufacturing
- Connected Aircraft / Advanced Flight Deck
- Composites Repair
- Digital Thread / Digital Twin
- Augmented / Virtual / Mixed Reality Applications in Manufacturing
- Digital and Data
- Cyber-Physical Security

Abstracts must be submitted online via website page to only ONE session. Offered papers shall not have been previously published; and if accepted, contributors will not release their paper for publication through other media.

Submission Rules

Abstracts must be submitted online via website page to only ONE session. Offered papers shall not have been previously published; and if accepted, contributors will not release their paper for publication through other media. The following information will be required during the on-line submission process:

1. A summary that states the objective of the paper/presentation
2. Tentative title
3. Name of the author and co-authors and all contact information
4. Selection of the most appropriate technical session

The following conditions and deadlines apply:

- Paper acceptance will be based on organizer moderated peer review of a review ready manuscript.
- Refer to the author resources site at sae.org/ participate/volunteer/ author for other useful information in preparing your paper.
- Portal for submission of abstracts will be open on March 25, 2019
- Abstract submission period: March 25 through August 13, 2019
- Review Ready Manuscripts due to session organizers September 24, 2019
- Final Manuscripts and copyright assignment due to SAE January 7, 2020

Upon submission, you will receive an automatic reply with your paper offer number. If you do not receive a paper offer number at that point, please retry on-line submission or contact Destiney Coy at destiney.coy@sae.org.

Authors will be charged a nominal registration fee for conference attendance.

General Author Resources Page
volunteers.sae.org/authors.htm

How to Write an SAE International Technical Paper
volunteers.sae.org/authors/sae_tech_paper.pdf

Reviewer Resources
If you are interested in becoming a paper reviewer, guidance and judgement information is provided **here volunteers.sae.org/reviewers.htm**

For questions contact Destiney Coy
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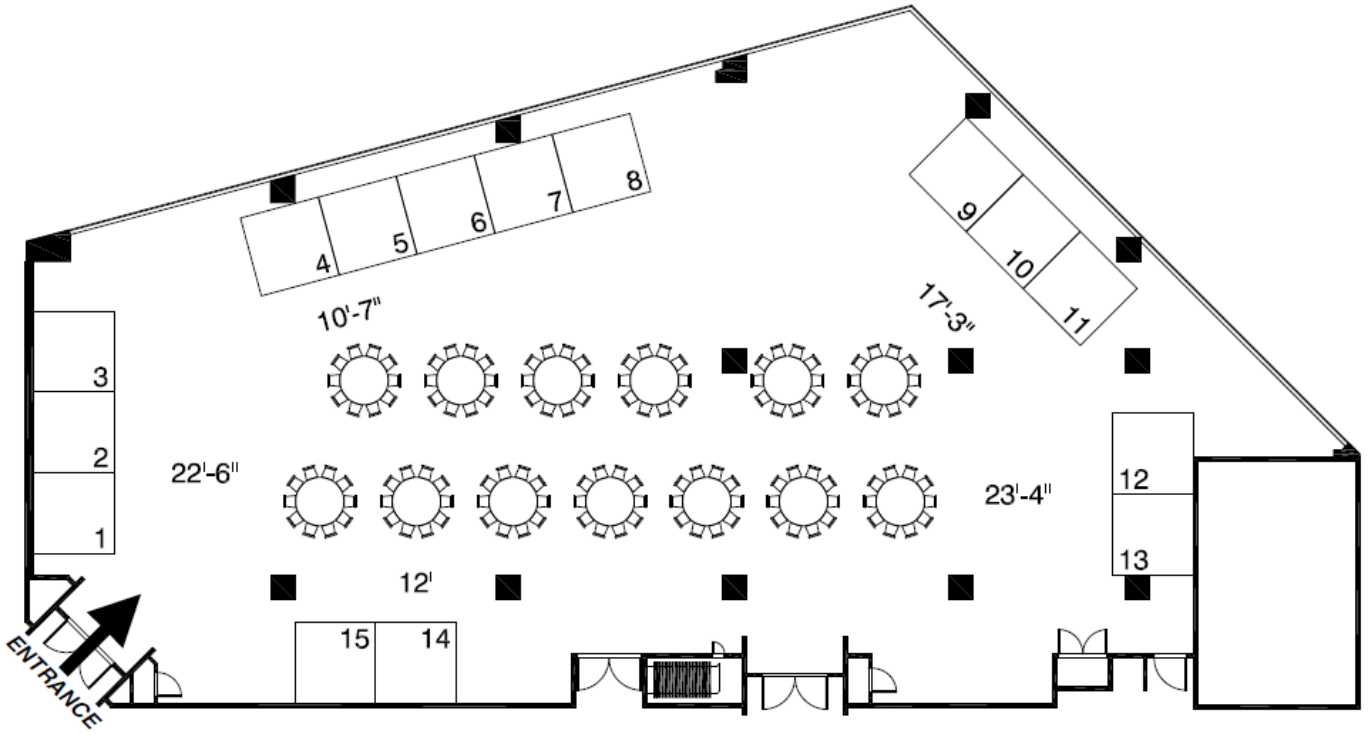
EXHIBIT FLOOR PLAN



Listing of Exhibitors

1. Collins Aerospace
2. Collins Aerospace
3. National Research Council Canada
4. CAV Systems Ltd
5. Aero Ice Free
8. Eologix Sensor Technology GmbH
15. Ice Shield De-Icing, SMR Technologies Inc.

EXHIBITOR PROFILE

Exhibitor Directory text is published as submitted by exhibiting companies.

COLLINS AEROSPACE Booth 1

PLATINUM SPONSOR

400 Collins Rd NE
Cedar Rapids, IA 52498
United States
collinsaerospace.com

Collins Aerospace is a leader in technologically advanced, intelligent solutions for the aerospace and defense industry. Created in 2018 by bringing together UTC Aerospace Systems and Rockwell Collins, we have the capabilities, comprehensive portfolio and expertise to solve our customers' toughest challenges and meet the demands of the global marketplace.

AERO ICE FREE Booth 5

5 Hahilazon St
Ramat Gan 5252269
Israel

Aero Ice Free developed a state-of-the-art composite materials leading edge with integrated mechanical deicing system which enables flight in known icing conditions. The technology provides significant advantages such as: low weight, low power consumption, easy to maintain system and eco-friendly solution.

CAV SYSTEMS LTD Booth 4

No 1 Industrial Estate
Consett Durham DN8 6SR
England
caviceprotection.com

CAV is a leading Tier 1 supplier of ice protection and drag reduction technology to general aviation, commercial aerospace, and defense markets worldwide. Working alongside aircraft engineers, CAV assist in the design, analysis, manufacture and approval of unique technology solutions for critical safety challenges and increase the efficiency of flight.

EOLOGIX SENSOR TECHNOLOGY GMBH Booth 8

Kratkystrasse 2
Graz 8020
Austria
eologix.com

Eologix develops innovative sensors for smart surfaces. The wireless and flexible sensor is able to measure temperature, vibration and icing of surfaces. Due to the easy mounting process, it can be used for nearly all types of surfaces and thus, be used in a huge variety of applications.

ICE SHIELD DE-ICING SMR TECHNOLOGIES INC Booth 15

93 Nettie Fenwick Rd
Fenwick, WV 26202
United States
iceshield.com

Ice Shield® specializes in high quality de-icing products for general and commuter aviation. Products include: pneumatic wing boots, propeller electrothermal boots, wire harnesses, hardware and accessories. Our products are reliable, durable and accompanied by first class customer service. Ice Shield offers a 48-hour delivery guarantee and a no-hassle warranty.

NATIONAL RESEARCH COUNCIL CANADA Booth 3

1200 Montreal Rd
Ottawa, Ontario K1A 0R6
Canada
nrc-cnrc.gc.ca/aerospace

The National Research Council of Canada's Aerospace Research Centre is home to world class testing facilities and leading industry experts. It works with Canada's vibrant aerospace sector to develop and certify innovative new products and technologies.

AD INDEX

SAE INTERNATIONAL EVENTS

2019

New Energy & Intelligent Connected Vehicle Technology Conference
May 21-22
Shanghai, China

Aviation Technology Forum
June 4-5
Shanghai, China

Noise and Vibration Conference & Exhibition
June 10-13
Grand Rapids, MI

escar USA
June 12-13
Ypsilanti, MI

International Conference on Icing of Aircraft, Engines, and Structures
June 17-21
Minneapolis, MN

SAE CyberAuto Challenge™
July 21-26
Warren, MI

JSAE/SAE International Powertrains, Fuels & Lubricants Meeting
August 25-29
Kyoto, Japan

COMVEC™
September 9-11
Indianapolis, IN

Connect2Car Executive Leadership Forum
September 17-18
Chicago, IL

On-Board Diagnostics - Americas
September 17-19
Garden Grove, CA

North American International Powertrain Conference
September 18-20
Chicago, IL

Brake Colloquium & Exhibition
September 22-25
Orlando, FL

AeroTech Europe
September 24-26
Bordeaux, France

Thermal Management Systems Symposium
October 15-17
Plymouth, MI

Innovations in Mobility
October 29-31
Novi, MI

Small Engine Technology Conference & Exposition
November 19-21
Hiroshima, Japan

DoD Maintenance and Logistics Exhibition
December 9-11
Spokane, WA

DoD Maintenance Symposium
December 9-12
Spokane, WA

2020

Connect2Car at CES
January 7
Las Vegas, NV

Government/Industry Meeting
January 22-24
Washington, DC

Hybrid and Electric Vehicle Technologies
January 28-30
Pasadena, CA

AeroTech Americas
March 17-19
Pasadena, CA

On-Board Diagnostics – Europe
March 24-26
Dublin, Ireland

High Efficiency IC Engine Symposium
April 19-20
Detroit, MI

WCX SAE World Congress Experience
April 21-23
Detroit, MI

COMVEC™
September 15-17
Rosemont, IL

North American International Powertrain Conference
September 16-18
Chicago, IL

Powertrains, Fuels & Lubricants Meeting
September 22-24
Krakow, Poland

On-Board Diagnostics - Americas
September 22-24
Indianapolis, IN

Thermal Management Systems Symposium
October 6-8
Mesa, AZ

Brake Colloquium & Exhibition
October 11-14
San Antonio, TX

Heavy-Duty Diesel Emissions Control Symposium
October 13-14
Gothenburg, Sweden

DoD Maintenance and Logistics Exhibition
December 7-9
Kansas City, MO

DoD Maintenance Symposium
December 7-10
Kansas City, MO

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