

REGISTRATION / WELCOME

PLENARY SESSION 1 - OPENING

Chair: Christian Mari (Chair of AEC2020)
Welcome by Louis le Portz & Michel Scheller, 3AF Presidents
Alain Rousset, "Nouvelle Aquitaine" Region President

COFFEE BREAK

Table with columns: ANERS, Auditorium A, R01 (G1+G2), R02 (D1+D2), R03 (F1), R04 (E1), R05 (E2), R06 (F2), R07 (H1), R08 (H2). Rows include sessions like 'Symposium Introduction and Session Moderation' and 'RT1: Research Networks Activity Reports'.

LUNCH

PLENARY SESSION 2

Chair: Christophe Hermans, DNV
KEYNOTE SPEECH 1: The space climate observatory : a green new deal, Jean-Yves le Gall, President CNES
KEYNOTE SPEECH 2: "Clean Sky: towards climate-neutral aviation", Axel Krein, Executive Director Clean Sky JU

Table with columns: Session title, Session 10: NOISE IMPACTS, Session 11: Aerodynamic Aircraft performance, Session 12: Hybrid/Electric Thermal management, Session 13: Composites analysis & modelling, Session 14: Numerical Simulation and Optimization of Novel Aircraft Concepts, Session 15: Clean Space, Space Debris II, Session 16: Environmental Control and Life Support in Space, Session 17: Space Propulsion II. Rows include sessions like 'An overview of ANIMA's achievements on aviation impact management' and 'Quality of Life: An expanded agenda of airport responsibility'.

COFFEE BREAK

Table with columns: Session 18: On board energy management & Alternative Power Source, Session 19: Hybrid Electric Propulsion and Aircraft, Session 20: Space Aero Thermo Dynamics, Session 21: Aerodynamic/Laminarity, Session 22: Green and safe systems & operations I, Session 23: Testing, monitoring & certification, Session 24: Numerical Simulation and Optimization of Novel Aircraft Concepts, Session 25: Testing I, Session 26: Structures, Thermal and Mechanisms I, Session 27: Space Propulsion III. Rows include sessions like 'A role for communication and engagement in a comprehensive approach to aircraft noise annoyance mitigation' and 'Aircraft Noise Management Practices in Eastern European countries'.

END OF DAY 1

TRANSFER TO BORDEAUX COUNTY HALL (TRAM)

COCKTAIL PARTY

BORDEAUX COUNTY HALL

PLENARY SESSION 3

Chair : Rafael Bureo Dacal, ESA

KEYNOTE SPEECH 3: Common aeronautics-space technologies, Pascale Ehrenfreund, DLR Chair

KEYNOTE SPEECH 4: Space Electric propulsion, José Gonzalez del Amo, Head of the Electrical Propulsion Section, ESA

COFFEE BREAK

Main conference program table with columns for ANERS, AERONAUTICS, and SPACE. Rows include sessions on Alternative Fuels, ACARE Goals, Noise Reduction, and various technical papers. Includes a LUNCH section and a ROUND TABLE 1 section.

END OF DAY 2

TRANSFER TO DINNER VENUE (TRAM)

GALA DINNER (PALAIS DE LA BOURSE)

Thursday 27th February 2020

09:00 - 10:00

PLENARY SESSION 4  
Chair: Valérie Guénon, Safran  
KEYNOTE SPEECH 5: Green bizjet technological developments within aeronautical research programmes, Bruno Stoufflet, CTO Dassault Aviation and Vice-Chairman of CORAC

10:00 - 10:30

COFFEE BREAK  
KEYNOTE SPEECH 6: The Route to Sustainable Aviation, Paul Stein, CTO Rolls-Royce

10:30-10:50

| COFFEE BREAK  |   |  |  |   |   |  |
|---|---|--|--|---|---|--|
| ANERS   |   | Aeronautics  |  |   | Space   |  |
| Auditorium A  | R01 (G1+G2)   | R02 (D1+D2)  | R03 (F1)   | R04 (E1)  | R05 (E2)  | R06 (F2)   |
| Session 50 : Emissions<br>Moderation: Paul Madden (RR) & Olivier Penanhoat (Safran) | Session 51 : High Speed Transport & Environment<br>Chair: S. Chernykh (TAAGI) | Session 52 : Evaluation of New Concepts<br>Chair: C. Hermans (DWW) | Session 53 : Testing, Design methods & concepts I<br>Chair: C. Hillenberns (DLR) | Session 54 : Materials Modelling, Analysis and Testing<br>Chair: S. Shroff (CS) | Session 55 : Green and safe systems & operations II<br>Chair: M. Bourgois (Eurocontrol) | Session 56 : Space Structures, Thermal and Mechanisms II<br>Chair: P. Corberand (Airbus Defence And Space) |

10:50-11:10

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| 653<br>Impacts of cloud layers overlap on contrail-attributable radiative forcing<br>I. SANZ-MORERE, MIT, US | 620<br>A Method for Supersonic Commercial Market Estimation and Environmental Impact Evaluation<br>C. WEIT, Georgia Tech / Ona, US | 581<br>An analytical approach to determine the impact force of small unmanned aerial vehicle collisions with rigid and elastic targets<br>F. FRANKE, Technische Hochschule Ingolstadt, DE | 138<br>Rapid Wind Tunnel Testing & Advanced Instrumentation - Future Testing Pillars<br>P. WHITE, Airbus Operations Ltd, GB | 699<br>Finite element analysis of composite double-swept helicopter blades using node dependent kinematics<br>M. FILIPPI, Politecnico Di Torino, IT | 202<br>Optimal Definition of a Short-Haul Air Transportation Network for Door-to-Door Mobility<br>L. TRANELLI, Politecnico Di Milano, IT | 162<br>Fiber Bragg Gratings for prognostics in space applications: a thermo-mechanical characterization of minimally invasive sensing techniques<br>P. C. BERRI, Politecnico Di Torino, IT |
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11:10-11:30

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| 78<br>The contribution of carbon dioxide emissions from the aviation sector to future climate change<br>E. TERRENOIRE, ONERA, FR | 496<br>Key technologies for new generation SST<br>A. KAZHAN, TAAGI, RU | 591<br>HUMS, enabling technology reconciling ecodesign and global value proposition in a Circular Economy?<br>K. LE BLÉVENEC, VITO, BE | 239<br>Common Numerical Methods & Common Experimental Means for the Demonstrators of the Large Passenger Aircraft Platform<br>W. KRUEGER, DLR, DE | 562<br>Bayesian reconstruction of goal orientated error fields in large aerospace finite element models<br>M. SONEY, University Of Nottingham, UK | 010<br>Experimental setup to measure and analyze ice adhesion on Air Cycle Machine turbine exit pipe surface<br>A. VINCENT, Cranfield University, UK | 129<br>EC H2020 Large Deployable European Antenna (LEA)<br>M. KOSMALSKI, Hps GmbH, DE |
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11:30-11:50

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| 215<br>Mitigation potential of climate-optimized routing: concept study for Europe<br>S. MATTHES, DLR, DE | 652<br>Global emissions estimation for commercial supersonic fleets under different design and regulatory scenarios<br>I. SANZ-MORERE, MIT, US | 016<br>An overview of the current and future aircraft environmental control system and its air filtration system<br>E. ZAVAGLIO, UTRC, IE | 013<br>Aircraft Engines Test Facilities Design Optimization for Flight Increased Safety and Environment Impact Reduction<br>V. SILVESTRI, COMOTI Romanian Research and Development Institute for Gas Turbines, RO | 108<br>Dry Sliding Behavior and Particulate Emissions of a SiC-Graphite Composite Material for Braking Systems<br>P. JAYASHREE, University of Trento, IT | 251<br>Thermal-Dynamic Investigation of Advanced System Control Strategies for Decentralized Electro-Hydraulic Power Generation in More Electric Aircraft<br>N. TROCHELMANN, Hamburg University Of Technology, DE | 063<br>Closing force evaluation of a sample return capsule for a Phobos Sample Return mission<br>R. MIHALACHE, Romanian Research and Development Institute for Gas Turbines COMOTI, RO |
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11:50-12:10

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| 134<br>Aviation's air pollution impacts in a changing world: effects of changing background atmospheric composition<br>I. DEDOUSSIS, TU Delft, NL | 693<br>STRATOFLY MR2: towards a complete decarbonization of long-haul routes<br>R. FUSARO, Politecnico Di Torino, IT | 107<br>Development of Fault Tolerant Electro-Mechanical Actuation System for Ailerons of Regional Aircraft<br>T. RPEL, Honeywell, CZ | 481<br>Development of a Multifunctional Fuselage Demonstrator<br>S. VELDMAN, Fokker, NL | 228<br>Simulation of the impact behavior of various materials<br>Y. TOSO, DLR, DE | 458<br>Passive anti-icing system using pass-through evaporator capillary pumped loop<br>R. ROBOOD, Euro Heat Pipes, BE | 252<br>Wall Roughness Modeling in Rocket Combustion Chambers<br>O. RAFFAELE, Technische Universitat Muenchen, DE |
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12:10-12:30

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| 584<br>Safran ultrafine particles campaigns in 2019<br>P. DUCHAINE, Safran, FR | 690<br>H2020 STRATOFLY Project: technical and operational challenges of hypersonic flight<br>N. VIOLA, Politecnico Di Torino, IT | 680<br>Image-Based Path Following Control of an Unmanned Quadrotor<br>H. HITOMU SAKI, National Research Institute Of Fire And Disaster, JP | 576<br>New Concepts of Environmentally Friendly High-Lit Devices and Their Application in a Small-Aircraft Transport Area<br>W. STALEWSKI, IGA, PL | 734<br>Optical fibre Bragg grating sensors for BVID detection on composite sub-components<br>S. GOOSENS, Vrije Universiteit Brussel, BE | 056<br>Ground Loads Time Monitoring System<br>E. GOMEZ, Airbus, ES | 230<br>Structural vibration control with passive isolation system for propulsion equipment<br>P. ROSARIO, Airbus, GB |
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12:30-13:40

LUNCH

13:40 - 14:40

ROUND TABLE 2: Electric/hybrid Propulsion  
Moderator: Rolf Henke, DLR Executive Board Member for Aeronautics Research  
Participants: Stéphane Cuello, CTO Safran, Jean Brice Dumont, Executive Vice President Engineering, Airbus, Mike Benzakein, former CTO GE, Assistant Vice President for Aerospace and Aviation Research Univ. Ohio State

14:40-15:00

| Aeronautics   |   |  |   |   |  |  |
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| ANERS   |   | Aeronautics  |   |   | Space  |  |
| Session 50 Conf'ed : Emissions<br>Moderation: Paul Madden (RR) & Olivier Penanhoat (Safran) | Session 51 Conf'ed : High Speed Transport & Environment<br>Chair: S. Lemaire (Dassault)                         | Session 57 : CLEAN SKY Technology Evaluator<br>Chair: J-F. Brouckaert (CS) | Session 58 : Propulsion<br>Chair: V. Guénon (Safran)  | Session 54 Conf'ed : Materials Modelling, Analysis and Testing<br>Chair: S. Shroff (CS)   | Session 59 : Autonomous Aircraft Operations<br>Chair: T. Melin (FOI)   | Session 60 : Mission Design and Space Systems I<br>Chair: P. Landiech (CNES) |
| 232<br>Case study on the environmental impact and efficiency of travel<br>E. OTERO, KTH, SE | 495<br>The influence of the overpressure signature shape on the sonic boom loudness<br>V. GORBOVSKOY, TAAGI, RU | 155<br>Clean Sky 2, Technology Evaluator*<br>N. FLUETHMANN, DLR, DE        | 261<br>Methodology assessment for the design and analysis of aero-engine short intakes<br>L. BOSCAGLI, Cranfield University, GB | 747<br>Innovative manufacturing and numerical modelling of thermoplastic and thermoset composite structures for SHM aerospace application<br>M. MORA-MENDIAS, FIDAMIC, ES | 638<br>4D Flight Trajectory Optimization by Modified Dynamic Programming Approach<br>A. KAWSER, University Of Beira Interior, PT | 069<br>CNES Balloon systems and activities<br>V. DUBOURG, CNES, FR           |

15:00-15:20

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| 571<br>Marginal Climate and Air Quality Costs of Aviation Emissions<br>C. GROBLER, MIT, US | 555<br>Supersonic aircraft compliance with noise requirements to LTO performances and airport noise exposure/impact assessment and management<br>O. ZAPOROZHETS, National Aviation University, UA | 089<br>Environmental Impacts of Clean Sky 2 Technologies for Next Large Passenger Aircraft<br>P. ARBEZ, Airbus Sas, FR | 605<br>Clean Sky 2 Large Passenger Aircraft - Techno Bricks for future engines<br>C. DIETJE, Safran Aircraft Engines, FR | 403<br>Architecture-based conceptual design for mechanical systems applied to landing gear<br>E. ALLEGAERT, Siemens, BE | 720<br>Optimized Sampling for Environmental Monitoring with Airborne Sensors<br>G. AVANZINI, Università del Salento, IT | 103<br>Venus sample return mission revisited<br>D. VALENTAN, Ifg, FR |
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15:20-15:40

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| RT2 Emissions Session Concluding Round Table<br>Paul Madden (RR) & Olivier Penanhoat (Safran) | 358<br>On the Possibility to Reduce the Intensity of Shock Waves Using Inlets with Application to Supersonic and Hypersonic Vehicles<br>C. SANDU, COMOTI, RO | 099<br>Clean Sky 2 TE - Environmental impact assessment of Fast Rotorcraft Concepts in the 2050 timeframe<br>M. VAN ENNIGE, NLR, NL | 482<br>Future Aircraft Propulsion-A Preliminary Overview of Difficult Choices<br>F. KIRKLAND, University Of Nottingham, GB | 445<br>Experimental and numerical study of the composite wing structure embedding solar cells<br>G. ROUXEL, Gm - Institut De Recherche En Génie Civil Et Mécanique, FR | 594<br>Determination of acoustic characteristics of Autonomous Aircrafts for environment protection and collision avoidance in flight restricted zones<br>V. MAKARENKO, National Aviation University, UA | 723<br>Dynamic Motion of a Descent Vehicle during the Landing Stage<br>M. HERMOGLIA, School Of Aeronautical And Space Engineering, Technical University Of Madrid, ES |
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15:40-16:00

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| RT3 Environmental Interdependencies:<br>D. Mavris (Georgia Tech)<br>D. Zingg (UTIAS)<br>E. Kora (Safran)<br>M. Vinkainen (FINAVIA)<br>A. Garcia Sainz (ARC)<br>B. Olfenfort (NLR)<br>Moderation: Delia Dimiriu (MMU) & Fay Collier (NASA) | 228<br>Noise Reduction of Supersonic Civil Aeroplane at Takeoff And Landing Using Programmed Engine Throat Control<br>I. KHALETSKII, Central Institute Of Aviation Motors, RU | 295<br>Design Evaluation and Performance Assessment of Fast Rotorcraft Concepts in the 2050 timeframe<br>D. NALANDA, Cranfield University, GB | 337<br>Multi-fidelity assessment of exhaust systems for complete engine-airframe configurations<br>J. HUESO REBASSA, Cranfield University, GB | 008<br>Passenger aircraft composite centre wing box structure optimization<br>M. KOWALSKI, Warsaw University Of Technology, PL | 141<br>Environmental Benefits of Cooperative Obstacle Avoidance for Unmanned Aerial Vehicles using Artificial Potential Field<br>D. P. MREA, University of Bristol, UK | 401<br>Future-Oriented Research Platform For Orbital Cryogenic Storage Technologies (FROST)<br>T. E. BRUNS, DLR, DE |
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16:00-16:20

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| 577<br>Design Optimization and Dynamic Characterization of a Tallies High Speed Aircraft Configuration<br>C. NAE, Incas, RO | 421<br>European TRANSCEND for novel aircraft propulsion and alternative fuels roadmaps towards 2050<br>J. KOS, NLR, NL | 482<br>VHBR Propulsion Technology - Smart Integration of Demonstrators and Techno-Bricks<br>C. CORDO, Rolls-Royce Plc, GB | 167<br>Investigation of Load Collectives on Transport Aircraft Using Continuous Turbulence for Fatigue Analysis Purposes<br>V. HANDOJO, DLR, DE | 334<br>GPAHRS - navigation enabler for more autonomous international<br>G. BOURRELY, Honeywell International, CZ | 629<br>Modern Techniques and Technologies for Space Flight Vehicle Engineering<br>G. ORTEGA, European Space Agency, NL |
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16:20-16:50

| COFFEE BREAK  |   |  |  |   |  |   |
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| ANERS   |   | Aeronautics  |  |   | Space  |   |
| Session 62 Conf'ed : ANERS Final Session  | Session 64 : Urban air mobility and its impact on the environment<br>Chair: J.-L. Strelec (Thales)      | Session 65 : Testing, Design methods & concepts II<br>Chair: C. Hillenberns (DLR)                  | Session 58 Conf'ed : Propulsion<br>Chair: G. Way (Rolls Royce)                   | Session 61 Conf'ed : Structures Design<br>Chair: P. Schmolgruber (ONERA)  | Session 66 : Satellite Communications & Operations, Software and Robotics<br>Chair: R. Bureo (ESA)               | Session 63 conf'ed : Mission Design and Space Systems II<br>Chair: P. Landiech (CNES)   |
| RT3 Environmental Interdependencies:<br>D. Mavris (Georgia Tech)<br>D. Zingg (UTIAS)<br>E. Kora (Safran)<br>M. Vinkainen (FINAVIA)<br>A. Garcia Sainz (ARC)<br>B. Olfenfort (NLR)<br>Moderation: Delia Dimiriu (MMU) & Fay Collier (NASA) | 053<br>New Mobility Concepts: Optimisation of Flight Movements in Europe<br>F. THRESEN, Tu Chemnitz, DE | 292<br>Wall-modelled LES (WMLES) of flow conditioners<br>H. ERDZAN, Queen's University Belfast, UK | 479<br>Testing a future UHBR low-speed fan<br>V. MELBOURNE, Rolls-Royce Plc., GB | 048<br>Failure modes analyses and impact on aeroelastic stability of a regional aircraft equipped with morphing winglets<br>I. DIMINO, CIRA, IT | 060<br>Design, manufacturing and testing of an antenna reflector for deep space missions<br>D. MIHAJ, COMOTI, RO | 550<br>The Impact of Superconductor-Based Power System Architectures On Payload Mass Fraction Optimization<br>M. COLLIER-WRIGHT, Neutron Star Systems, DE |

17:10-17:30

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| 360<br>A Methodology and first Results to assess the potential of Urban Air Mobility concepts<br>V. GOLLNICK, Hamburg University Of Technology, DE | 338<br>Comparison of two different flow diverters for inverted inlet<br>T. REN, Beijing Electro-Mechanical Engineering Institute, CN | 671<br>Parametric Study of a Solid Propellant Slotted Grain<br>O. YAQOUB, Military Technical College, EG | 139<br>Impact Resistant and Low-Weight Composite Solution for Aircraft Fuselage<br>R. RICARDO JORGE BRAGA ROCHA, Inegi, PT | 524<br>AI Enhanced Multi Media System Architecture for Human Habitation in Space Mission<br>H. KESUMA, Aes - Aircraft Elektro/Elektronik System GmbH, DE |
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17:30-17:50

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| Symposium Closing Speech<br>J. HILEMAN (FAA)<br>Moderation: Dominique Collin (Safran) | 392<br>Future Sky Urban Air Mobility: An Outlook on the New Thematic Programme within the EREA Joint Research Initiative<br>C. ESCHMANN, DLR, DE | 695<br>Supersonic Flow Analysis on Different Multi-Row Inlet Devices<br>G. SINGH, Amity University Uttar Pradesh, IN | 052<br>Effects of Material and Geometrical Parameters on the Design of a Trailing Edge Twist and Camber Morphing Surface<br>Y. ZAHOOR, Tu Delft, NL | 627<br>Ice Digging Robot with Navigation<br>P. CATALIN, Incas, RO |
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17:50-18:10

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| 668<br>Applications of a novel Semi-Active Piezoelectric Tuned Mass Damper for Vibrations Mitigation in Aircraft Structures<br>N. CHRYSOCHODIS, Patras University, GR |
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18:10 - 19:00

PLENARY 5 - CLOSING: Chair Z. Goraj, TU Warsaw, CEAS President  
KEYNOTE SPEECH 7: Clean Aviation in Horizon Europe - status and views from the European Commission, Hervé Martin, Head of Unit "Low Emission Future Industries" Directorate-General for Research and Innovation, Clean Planet, European Commission  
Best paper Award ceremony

19:00 - 21:00

WINE TASTING  
CONGRESS CENTER  
END OF THE CONFERENCE

POSTERS: From 25th to 27th February 2020 the posters will be displayed in the exhibition area

Friday 28th February 2020

TECHNICAL VISITS (from 9h00 to 13h00)  
- ArianeGroup Issac premises  
- Dassault Aviation  
- Thales

WINE TOUR (from 10h00 to 17h00, additional cost for the participants)

ReMAP Workshop

| Time          | Activity   | Presenter / Participants |
|---------------|--|--------------------------|
| 09:00 – 09:20 | Welcome, Introduction and presentation of ReMAP project  | Bruno Santos (TUD)       |
| 09:20 – 10:30 | ReMAP preliminary results, including: <ul style="list-style-type: none"><li>▪ The IT ecosystem</li><li>▪ SHM – Sensing technologies and initial tests</li><li>▪ PHM – initial diagnostics and prognostics models &amp; results</li><li>▪ Safety assessment and regulatory requirements</li></ul> | ReMAP Team               |
| 10:30 – 10:45 | Q&A  | All                      |
| 10:45 – 11:00 | Coffee break   | --                       |
| 11:00 – 12:00 | Brainstorm discussing: <ul style="list-style-type: none"><li>▪ Technical issues</li><li>▪ Market opportunities</li><li>▪ Data sharing</li><li>▪ Certification</li><li>▪ Existing running initiatives</li></ul>   | All – in groups          |
| 12:00 – 12:10 | Coffee break   | --                       |
| 12:10 – 12:30 | Summary of the brainstorm per group  | Groups representatives   |
| 12:30 – 12:40 | Conclusion and next steps  | Bruno Santos (TUD)       |





