

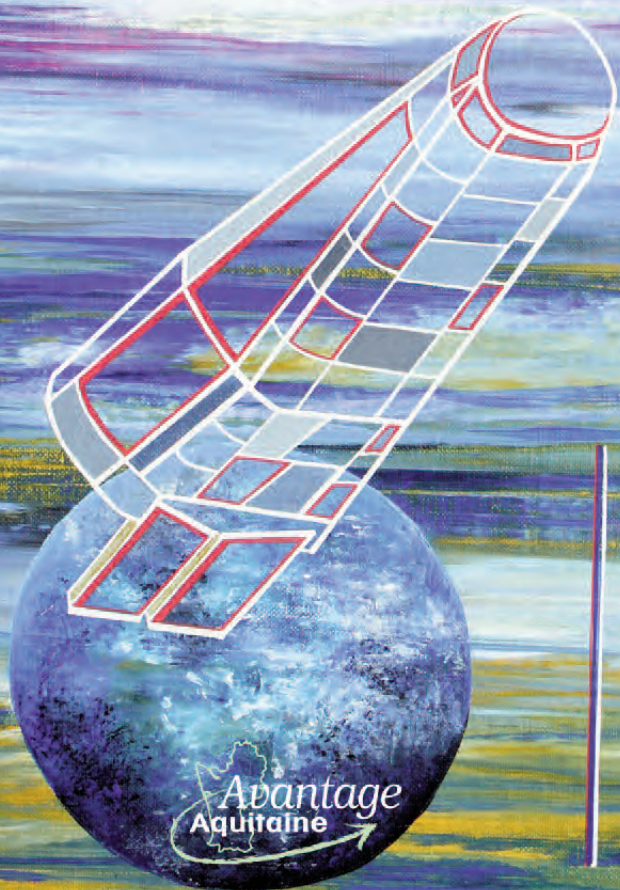


THE ATMOSPHERIC REENTRY ASSOCIATION

Presents the

5TH INTERNATIONAL ARA DAYS

May 18-20, 2015 / Arcachon – France



PROGRAMME

Avantage
Aquitaine





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DEAR MADAM, DEAR SIR, DEAR PROFESSIONALS OF THE ATMOSPHERIC REENTRY,

After 4 successful editions of the ARA Days (2006, 2008, 2011, 2013), the Association Board entrusted me, as President, to organize the fifth edition of this traditional Arcachon Atmospheric Reentry community rendez-vous.

The conference will once again bring together in the usual friendly way, scientists from the academic community and industry, students, research and development engineers, delegates from prime contractors and suppliers companies, agencies and end users representatives.

Some months after an European Space Agency Council at Ministerial level, the symposium will give the opportunity to exchange on the latest developments and projects dealing with Atmospheric Reentry.

2015 is for sure the year of ESA IXV vehicle: 17 years after the Atmospheric Reentry Demonstrator, Europe was back to flight this February with this outstanding lifting body. A special emphasis is thus given during the conference to IXV mission, design and sub-systems, with hopefully flight first exploitation and lessons learned.

Knowing also about follow-on programs like PRIDE will be a must!

News from other Agencies demonstrators programs, like ESA EXPERT, DLR SHEFEX and REX, are expected, as well as European Union Research & Technology future projects. The question of future demonstration missions & vehicles will be clearly raised during the Conference !

Last, but not least, the Conference will largely debate the subject of space debris reentry: LEO satellites at end of operational life, launchers upper stages, and also end of life of orbital servicing vehicles.

I am looking forward to meeting you again in a sunny Arcachon, for 3 remarkable days.

Yours faithfully,

Thierry Leveugle

President, The Atmospheric Reentry Association

May 18th, 2015

08h30-09h30

REGISTRATION
5th ARA Days Welcome Introduction

09h30-09h45

WELCOME ADDRESS
Thierry LEVEUGLE, ARA (FRANCE)

INTRODUCTION KEYNOTE

09h45-10h15

Plenary Speech: the IXV Programme
Giorgio TUMINO, ESA / ESTEC (THE NETHERLANDS)

10h15-10h45

COFFEE BREAK

PLENARY SESSION

10h45-11h15

IXV Project – Project and Mission Overview
Roberto ANGELINI, Thales Alenia Space (ITALY)

11h15-11h45

IXV Trajectory Predictions and Flight Performance Overview
Martins SUDARS, Thales Alenia Space (ITALY)

11h45-12h15

The IXV Guidance, Navigation and Control Subsystem:
from Qualification to a Successful Flight
Augusto CARAMAGNO, SENER (SPAIN)

12h15-12h45

The IXV Avionics System: Architecture Description, Ground Test Results
and Flight Telemetry Analysis
Stephane DUSSY, ESA / ESTEC (THE NETHERLANDS)

12h45-13h15

Development and Flight Qualification of C-SIC Thermal
Protection Systems for the IXV
François-Laurent BUFFENOIR, Herakles - Groupe Safran (FRANCE)

13h15-14h30

LUNCH

PLENARY SESSION

14h30-15h00

SHEFEX Story
Hendrik WEIHS, German Aerospace Center DLR (GERMANY)

AERODYNAMICS -
AEROTHERMICS - CFD

GNC AND FLIGHT
CONTROL

15h00- 15h20

IXV ATDB Tool And
Aerothermodynamic Characterization.
From the Design to the Flight
Vincenzo MARESCHI, Thales Alenia Space
(ITALY)

Model Based Attitude Control Design
for Shefex III
Jürgen TELAAR, Astrium Space
Transportation (GERMANY)

15h20- 15h40

Numerical Simulations of Flows
Past the IXV Capsule
Renato PACIORRI, Sapienza -
University of Rome (ITALY)

Mission Analysis and Flight Mechanics
Performances of IXV from
Design to Flight – Rodrigo HAYA,
DEIMOS Space S.L.U. (SPAIN)



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AERODYNAMICS - AEROTHERMICS - CFD - 1 -

- 15h40-16h00 Simulation of the Influence of Fluid Flow on C/C Composite Ablation
Cyril LEVET, CEA DAM (FRANCE)
- 16h00-16h20 Numerical Simulation of Ablation: Study of Fluid/Solid Coupling.
Simon PELUCHON, CEA / CESTA (FRANCE)

GNC AND FLIGHT CONTROL

- Enhanced Apollo Guidance for ESA High Precision Landing Mission on Mars
Philippe VERNIS, AIRBUS D & S (FRANCE)
- Final Flight Performance Predictions for the IXV GNC
Murray KERR, DEIMOS Space S.L.U. (SPAIN)

16h20-16h50

COFFEE BREAK

SUBSYSTEMS AIT

- 16h50-17h10 The IXV Body Flap Assembly – Development Milestones and Outlook
Harald LANGE, MT Aerospace AG (GERMANY)
- 17h10-17h30 Assembly and Integration of Instrumented Nose and Windward CMC TPS for IXV Program
Elena BRACH PREVER, Thales Alenia Space (ITALY)
- 17h30-17h50 IXV Body Flaps Actuators
Didier VERHOEVEN, SABCA (BELGIUM)
- 17h50-18h10 IXV Cold Structure Technical Challenges Related to the Aero-Thermodynamic Performance of the Vehicle
Fabrizio URBINATI, RUAG Space (SWITZERLAND)

TPS & THERMAL DESIGN - 1

- HYDRA - Design and Testing of a New Hybrid TPS for LEO & Moon Return Missions
Wolfgang P.P FISCHER, Airbus Defence & Space (GERMANY)
- ASTERM Low Density Ablative Material : Development Status
Jean-Marc BOUJILLY, AIRBUS D & S (FRANCE)
- Low Density Ablative Materials Modified by Nano-Fillers Addition: Manufacturing and Characterisation
Laura PAGLIA, Sapienza - University of Rome (ITALY)
- Crushable Thermal Protection System Definition
Didier ZÉLY, MECANO I&D (FRANCE)

20h00-23h00

CONFERENCE GALA DINNER



May 19th, 2015

PLANETARY ENTRY, DESCENT AND LANDING

- 09h00-09h20 Beagle-2 Lander Found on Mars
Philippe WATILLON, AIRBUS D & S (FRANCE)
- 09h20-09h40 Entry, Descent and Landing Systems for Human Missions to Mars
Jean-Marc SALOTTI, ENSC - IPB (FRANCE)
- 09h40-10h00 Paper on EXOMARS
Yann MIGNOT, AIRBUS D & S (FRANCE)
- 10h00-10h40 COFFEE BREAK

SPECIAL PLENARY SESSION: SPACE DEBRIS REENTRY

- 10h40-11h00 Order of Magnitude Analysis for the On-ground Risk Associated
with Uncontrolled Re-entries
Stijn LEMMENS, ESA / ESOC (GERMANY)
- 11h00-11h20 Overall Cost and Risk Indexing of a Space Debris reentry Project
Laura COSTANZA, Aviospace S.r.l. (ITALY)
- 11h20-11h40 Spacecraft Demise: Ablation Modeling
Jacques COUZI, CEA CESTA (FRANCE)
- 11h40-12h00 Airbus Safran Launchers and CNES R&T Studies
about Launchers Upper-stages Re-entry
Laurent CHEVALIER et Amaya ESPINOSA, Airbus Safran Launchers / CNES (FRANCE)
- 12h00-12h20 LOS Impacts on Satellite: Design for Demise
Benoît DILLENCHNEIDER, AIRBUS D & S (FRANCE)

12h20-14h00 LUNCH

PLENARY SESSION: GROUND SEGMENT AND OPERATIONS

- 14h00-14h20 The Intermediate eXperimental Vehicle – IXV - Ground Segment
Giovanni MARTUCCI di SCARFIZZI, ALTEC S.p.A. (ITALY)
- 14h20-14h40 Real-time IXV Trajectory Predictions at Mission Control Center
Martins SUDARS, Thales Alenia Space (ITALY)
- 14h40-15h00 IXV Recovery Operations
Stefano BOLOGNA, Thales Alenia Space (ITALY)



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SYSTEM DESIGN

- 15h00-15h20** Flight Prediction Methods and Models Applied during IXV Utilisation Phase
Rodrigo HAYA, DEIMOS Space S.L.U.
(SPAIN)
- 15h20-15h40** IXV Demonstrator Margin Policy and Qualification Approach
Angelo DENARO, Thales Alenia Space
(ITALY)
- 15h40-16h00** IXV DRS – Design , Verification Approach and Preliminary Insight in Flight Performances – Antonio SALUZZI, Thales Alenia Space (ITALY)

TPS & THERMAL DESIGN - 2

- IXV Thermo-Elastic Analysis for Steps & Gaps Verification and TPS Integration
Valerio BECCHIO, Thales Alenia Space
(ITALY)
- IXV TPS&HS Interfaces Design Solutions
Maria Teresa SIGMORELLI, Thales Alenia Space (ITALY)
- Qualification of Rear Face Thermography Technique under CO₂ High Enthalpy Flow in the ONERA F4 Wind Tunnel
Julien GARRAUD, ONERA (FRANCE)

16h00-16h30

COFFEE BREAK

- 16h30-16h50** Design and Test of a Small Entry Capsule for the Break Up Camera BUC on ATV 5
Sofia GIAGKOZOGLU, Germ Aerosp Center DLR (GERMANY)
- 16h50-17h10** About the Construction of a Robust Metamodel to Estimate the Stagnation Heat Flux for the Expert Vehicle
Andrea Francesco CORTESI, Inria Bordeaux (FRANCE)
- 17h10-17h30** Rocket Complex with Orbiter and with Liquid Propellant Engines on High Concentrated Hydrogen Peroxide (Up to 98 %)
Alexander LEVENKO, Air-Space Agency Magellan (UKRAINE)

Heat Transfer Modelling in Micro-X-Ray Tomography Composite Structure
Christophe TALLARON, CEA Le Ripault
(FRANCE)

IXV Thermal Control Post-Flight Hardware and Data Assessment
Giovanni LODDONI, Thales Alenia Space
(ITALY)

SMARTEES - A New Thermal Protection System for LEO Return Missions
Wolfgang P.P FISCHER, Airbus Defence & Space (GERMANY)

ROUND TABLE & DISCUSSION WITH DELEGATES

- 17h30-18h15** What experimental platforms or vehicles for future in flight research on reentry



May 20th, 2015

PLENARY SESSION: REENTRY PROJECTS PERSPECTIVES

- 08h30-09h00
IXV Initial Post-Flight Assessment
Angelo DENARO, Thales Alenia Space (ITALY)
- 09h00-09h30
Which Technologies for Re-entry Need Europe after the Success of IXV?
Arguments for a Re-entry Roadmap
José LONGO, ESA / ESTEC (THE NETHERLANDS)
- 09h30-10h00
IRENA (International Re-Entry demoNstrator Action)
Aurélien PISSELOUP, AIRBUS D & S (FRANCE)
- 10h00-10h30
Human Spaceflight Directorate Overview Paper about the Status
of Atmospheric Re-entry
Marco CAPORICCI, ESA / ESTEC (THE NETHERLANDS)
- 10h30-11h00
COFFEE BREAK

PLENARY SESSION: FUTURE MISSIONS

- 11h00-11h30
Preliminary Atmospheric Re-entry Flight Analysis for the USV3 Mission
Roberto PALUMBO, CIRA (ITALY)
- 11h30-12h00
Japan's Mars Rover Mission for Technology Demonstration and Life Search
Kazuhisa FUJITA, JAXA (JAPAN)
- 12h00-12h30
HYPLANE: Effects of Closer Aeronautics and Space
Gennaro RUSSO, Trans-Tech (ITALY)
- 12h30-13h00
Special Session Conclusion: Space Debris Reentry Status & Research Perspectives
Dominique PIROTAIS, ARA, CEA CESTA (FRANCE)
- 12h20-13h15
5TH ARA DAYS CONCLUSION
- 13h15-14h30
FAREWELL LUNCH



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Programme Committee

Roberto	ANGELINI	Thales Alenia Space (Italy)
Eric	ARQUIS	Bordeaux University - The Atmospheric Reentry Association (France)
Paolo	BAIOCCO	CNES (France)
Jean-François	BELON	Avantage Aquitaine (France)
Jean-Marc	BOUILLY	Airbus DS Space Systems - The Atmospheric Reentry Association (France)
Javad	FATEMI	Airbus Defence and Space (The Netherlands)
Franco	FOSSATI	Aviospace (Italy)
Ludger	FROEBEL	Airbus DS Space Systems (Germany)
Alain	LACOMBE	Safran Herakles - The Atmospheric Reentry Association (France)
Marc	LACOSTE	Safran Herakles - The Atmospheric Reentry Association (France)
Thierry	LEVEUGLE	President - The Atmospheric Reentry Association (France)
José	LONGO	European Space Agency (The Netherlands)
Pascal	MOUSSIER	INRIA - The Atmospheric Reentry Association (France)
Jean	MUYLAERT	Von Karman Institute (Belgium)
Marcello	ONOFRI	La Sapienza Rome University (Italy)
Dominique	PIROTAIS	CEA CESTA - The Atmospheric Reentry Association (France)
Giorgio	TUMINO	European Space Agency (The Netherlands)
Jean-Luc	VERANT	ONERA (France)
Hendrik	WEIHS	German Aerospace Center DLR (Germany)

GENERAL LOCATION

Palais des Congrès d'Arcachon Boulevard Veyrier Montagnères
33120 Arcachon – FRANCE
(3/4 hour drive from Bordeaux International Airport)

LANGUAGE

Papers will be presented in English. Simultaneous translation facilities will not be available.

REGISTRATION

Please download the registration form on www.avantage-aquitaine.com

SECRETARIAT



All correspondence and inquiries should be sent to the conference secretariat.

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