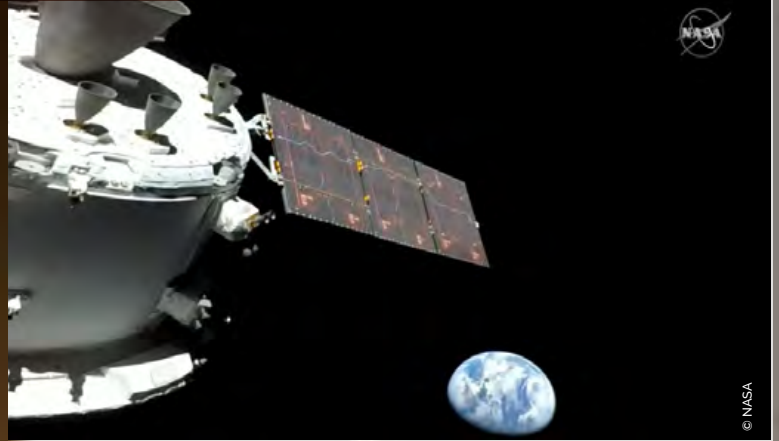


BULLETIN
**AEROSPACE
EUROPE**

ARTEMIS I MISSION: A NEW ERA OF DEEP SPACE EXPLORATION BEGINS!

1

2



1. 16 NOVEMBER AT 06:47 GMT, ORION SPACECRAFT IS LAUNCHED BY NASA'S SLS FROM KSC

2. EARTH AS SEEN FROM ORION 9 HOURS AFTER LIFTOFF

3. 11 DECEMBER AT 17:40 GMT: ORION SPLASHES DOWN IN THE PACIFIC OCEAN

PERFECT PERFORMANCE OF THE ESA'S EUROPEAN SERVICE MODULE



ABOUT HISST 2022 CONFERENCE

Dr Adam Siebenhaar, Chair HiSST Technical Committee



The High-Speed Vehicle Systems science and Technologies Conference, HiSST, promotes discussion between research institutes, academia, and industries from around the globe on research and development of enabling technologies for supersonic and hypersonic vehicles. With the recent addition of India, the HiSST Technical Committee ([link: https://ceas.org/hisst/](https://ceas.org/hisst/)) currently consists of representatives from thirteen countries/agencies:

1	Australia	8	India
2	Brazil	9	Italy
3	China	10	Korea
4	ESA	11	Russia
5	France	12	UK
6	Germany	13	USA
7	Japan		

After a successful 1st HiSST Conference in Moscow, Russia, in November 2018, we had to delay the 2nd HiSST Conference, originally scheduled for May 2020, due to COVID-19 restrictions until September 2022 when we executed it as originally planned in Bruges, Belgium, from September 12 to 16. The host of the 2nd HiSST Conference was Professor Johan Steelant, ESA, who did an admirable job in dealing with one postponement after the other. The Technical Committee mitigated remaining COVID related concerns by structuring all presentations to be optional on-site or on-line. CEAS and ESA managed and financially supported as illustrated below.

A total of 227 persons, from twenty-three countries,

attended the conference. The majority was from Europe with Germany and France being in the lead. The Pareto chart to the right below contains both bars and a line graph, where the number of attendees are represented in descending order by bars, and the cumulative total is represented by the line.

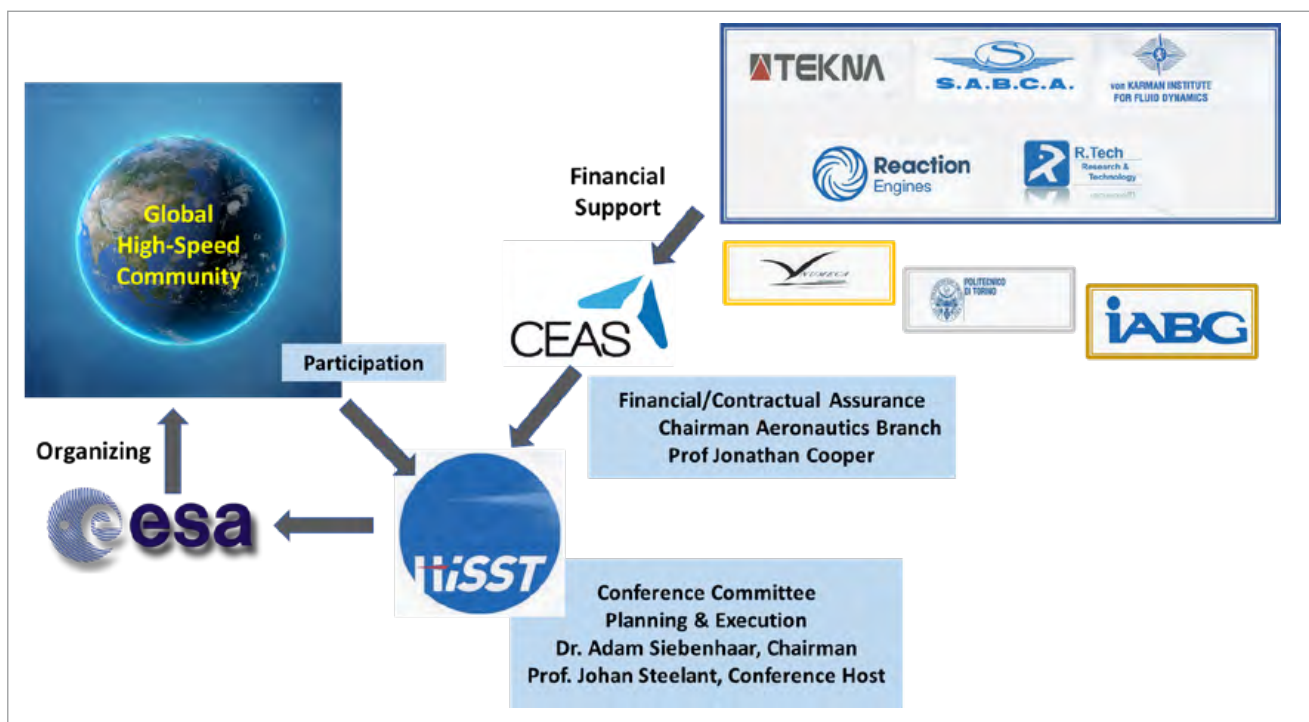
The overall program consisted of four major components:

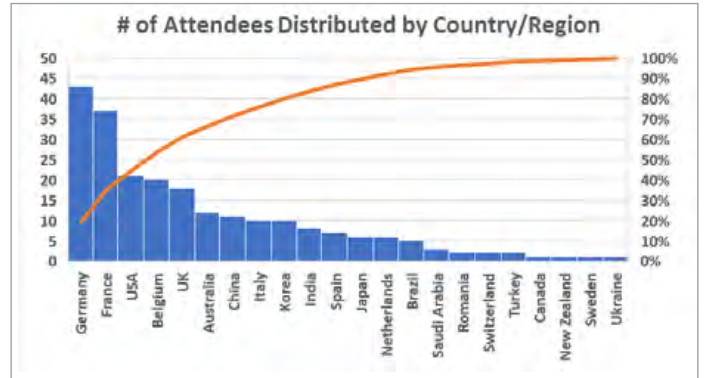
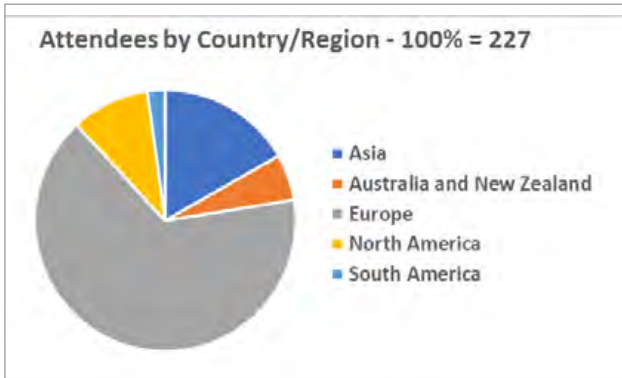
- A. Plenary Sessions
- B. Paper Sessions
- C. Social Program
- D. Visit to the Von Karman Institute in Brussels.

After the conference, the HiSST committee entertained a survey about the quality of the conference. A total of ninety-nine responses were recorded. The survey outcome overall was positive, specific survey results are shown at the end of the above-mentioned sections A. through D.

A. We offered two types of Plenary Sessions.

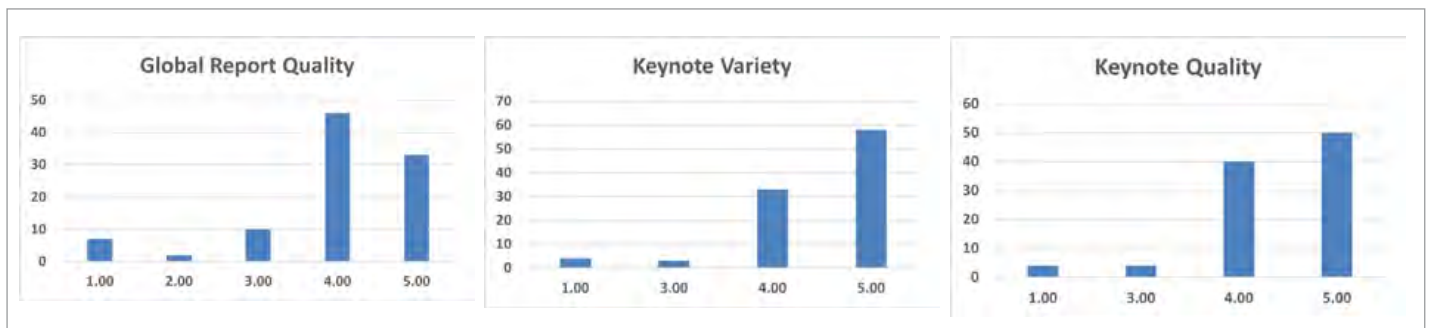
1. **Global Reviews** have the goal to provide an overview from each Technical Committee Member country of its engagement and plans of relevant high-speed vehicle science and technologies during the recent past, the present, and the near- and long-term future. Ten of the at that time twelve member countries took part in this event.





- 2. Keynote Speeches** have the aim to provide insight in a particular field of interest to the high-speed community from the point of view of a renowned expert. The six speeches presented were:
- **Ceramic Matrix Composite (CMC) Thermal Protection Systems (TPS) and Hot Structures for Hypersonic Vehicles**, David E. Glass, NASA Langley Research Center, USA
 - **High-Speed Vehicles Research in EU International Programs**, Pablo Perez-Illana, Deputy Head of European Commission's CINEA Agency Horizon Europe Transport, EU
 - **Advances in the Simulation of Hypersonic Flows: The Power of HighOrder Numerics**, Graham Candler

- Aerospace Engineering & Mechanics University of Minnesota, USA
- **Challenges and Recent Progress in Instrumentation of Hypersonic Flight and Ground Experiments**, Ali Gülhan, DLR, Germany
 - **Transition in High-Speed Flow with and without Surface Roughness Elements**, Neil Sandham, Aeronautics and Astronautics, University of Southampton, UK
 - **Curved Shock Theory and Dual Waverider Concept**, Yancheng You, School of Aerospace Engineering, Xiamen University, China
- Section A Survey Results:** Global Reports quality, and Keynote variety and quality were high and well received.



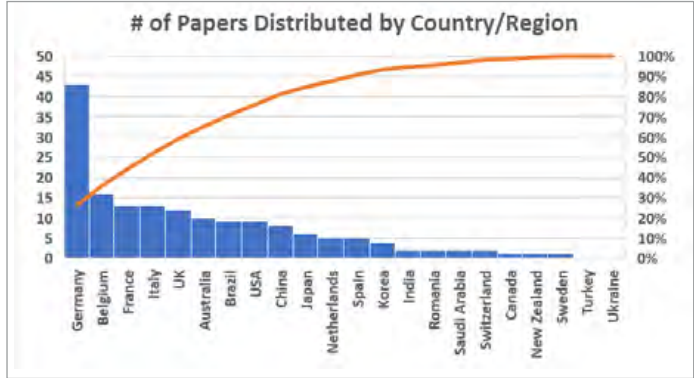
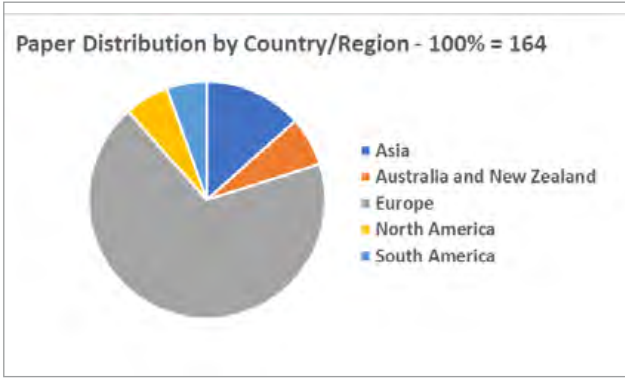
B. The Paper Session addressed technical manuscripts covering nine high-speed technology subtopics

1. Missions & Vehicles
2. Propulsion
3. Thermal & Energy
4. Guidance & Control
5. Materials & Structures
6. Aerothermodynamics
7. Testing & Evaluation
8. Operation & Environment
9. Fundamentals & History

Originally HiSST had received about 360 technical paper abstracts for the conference planned in 2020. After four delays, this number had shrunk to 160 due to still persistent COVID restrictions in China, the Russian East European conflict, authors having graduated and moved on, and other cancellations. A total number 160 papers from twenty countries were presented. As expected, the majority was from Europe with Germany standing out as the leader. Overall, 70% of the attendees presented a paper which is an attractive number for a conference of this type.

Conference attendants participated in a workshop on the topic of Boundary Layer Transition borne and sustained by the sizeable attendance of experts in this field. The Technical Committee identified two Paper Awards:

Best Student Paper
Quantifying the Surface Heat Transfer on Transpiration Cooled Porous Materials in Laminar and Turbulent Hypersonic Boundary Layers, Imran Naved, Fluid Gravity Engineering Ltd, UK; Tobias Hermann and Chris Hambridge, University of Oxford, UK; Hassan Saad Ifti, Uni-



iversity of Maryland, USA; Matthew McGilvray, University of Oxford, UK; Iulia S Tirichenko and Luc Vandeperre, Imperial College London, UK

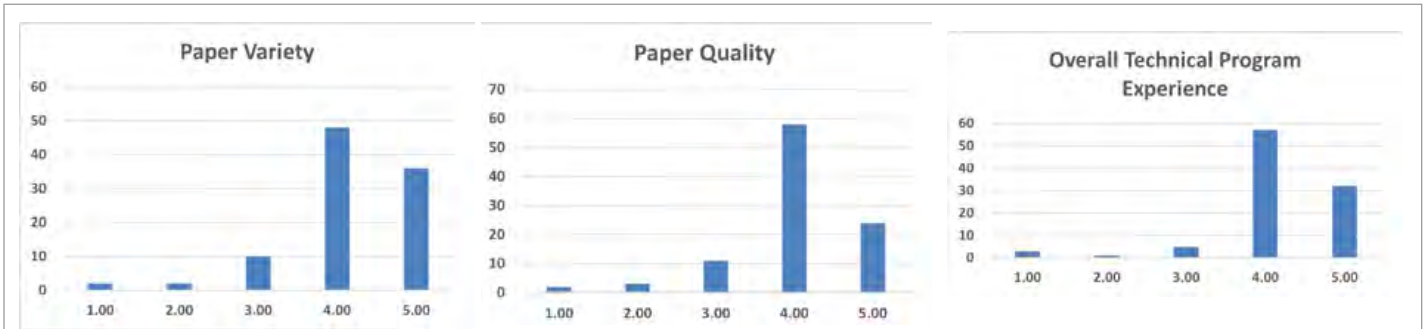
Ella Giskes, Harry W.M. Hoeijmakers, Cees H. Venner, Frans B. Segerink, Herman L. Offerhaus, University of Twente, The Netherlands

Overall Best Paper

Schlieren Visualization of Dual Injection in Supersonic Cross Flow, Siemen Smink, Sem de Maag, Cor. W. Lerink,

Section B Survey Results:

The attendees' assessment of the paper variety and quality, along with the overall program experience, was very positive.

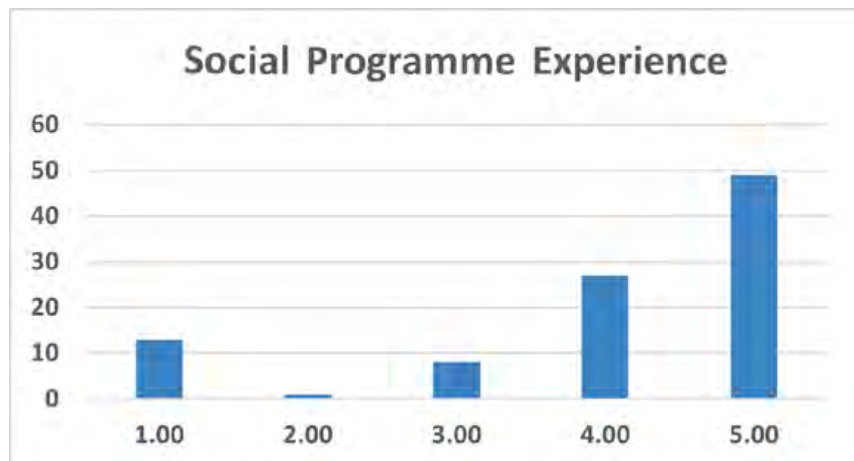


C. We executed the social program as originally planned, and it consisted of:

- Lunches served at the conference venue from Monday through Thursday
- A Welcome Reception at the old brewery "De Halve Maan" including a guided tour
- A Gala Dinner at the "Belgium Pier Blankenberge" where

we presented and celebrated the Best Student Paper and the Overall Best Paper Awards. We base our optimism on very favorable survey results, and are looking forward to welcoming you in Busan., Korea, in April 2024, 2024 (link: hisst2024.com).

Section C Survey Results:



D Participation of the Von Karman Institute, VKI, visit on the fourth conference day was optional. We supplied busses for the roundtrip ride from Bruges to the institute near Brussels and back. VKI scheduled three consecutive institute tours, a tour lasted around one hour.

Next HiSST Conference

Now we are looking forward to the next conference in Busan, Korea. Professor Jeong-Yeol Choi, Pusan National

University, assumed the responsibility of hosting the 3rd HiSST Conference which the Korean Society for Aeronautical and Space Sciences, KSAS, and the Korean Society of Propulsion Engineering, KSPE will jointly support.

With COVID behind us and having demonstrated a successful HiSST 2022, we expect to regain our earlier momentum for another great conference. We base our optimism on very favorable survey results.

