

## P R E F A C E

The 16th Congress of the International Council of the Aeronautical Sciences (ICAS) of which these volumes are the proceedings, is being held in Jerusalem from August 28th to September 2nd, 1988. The host Society is the Israel Society of Aeronautics and Astronautics which hosted the 1974 Congress.

ICAS was founded in 1957 by the late Theodore von Karman, its first President, to encourage the free exchange of information on all aeronautical problems of significant scientific interest and to promote international co-operation in the study of such problems. These are still dominant objectives of ICAS.

ICAS, today, is a federation of the aeronautical societies of thirty-one countries as Full Members, and is additionally supported by aerospace companies and technical and scientific institutions from all over the world as Associate Members.

The biennial ICAS Congress is recognised as the primary international forum for aeronautical scientists and engineers. This is demonstrated by the increasing number of papers submitted for presentation at successive Congresses. A total of about 240 papers have been chosen from over 400 submitted for this Congress and for the first time it has been found necessary to organise as many as six parallel Sessions. The success of the presentation of student papers in allocated periods

at the last Congress in London (1986) has encouraged us to again allocate such periods.

In the ICAS tradition, the program highlights current critical areas and growth points. Hence, in addition to the important basic topics of aerodynamics, flight mechanics, structures and propulsion there is particular emphasis on aircraft design and operation, systems technology, avionics, hypersonics, composite and other materials and the wide-ranging applications of computational methods.

The Opening Session, starting at 9.00 a.m. on Monday August 29th, will feature welcoming addresses by distinguished representatives of the host country including the Chairman of the Israeli Organising Committee, and the ICAS President. Following these addresses Professor William R Sears, Emeritus Professor of the University of Arizona, will deliver the Daniel and Florence Guggenheim Memorial Lecture:

The Outlook for Wind Tunnel Testing.

Another major feature of the Congress is the ICAS-von-Karman Award for International Co-operation in Aeronautics. Different to the decisions made in previous years where co-operations in international aircraft programs such as Tornado, Airbus and B767 have been acknowledged, this time special attention has been given to a co-operative research project on the structure of vortex flow over delta wings. This indicates the interest of ICAS to promote international co-operation in the whole field of aeronautics from basic science up to the final product. The Award is to be presented on Friday September 2nd to

Dr G Drougge of the FFA, Sweden, Ira Elsenaar of the NLR, Netherlands, Professor H Hornung of the DFVLR, Goettingen, FRG and Dr G K Richey of the Aeronautical Laboratories, Wright-Patterson Air Force Base, USA, involving their respective institutes. The accompanying ICAS-von-Karman Lecture "International Vortex Flow Experiment" will be delivered by Dr G Drougge.

As a memorial to that great scientist and engineer, Maurice Roy, who worked enthusiastically for ICAS since its inception and was its second President and Honorary President furtheron, it has been decided to institute the Maurice Roy Medal to be awarded to an individual for outstanding contributions to international collaboration in aeronautics. The first award will be made to Philippe Poisson-Quinton, recently retired from ONERA, and it will be presented at the Banquet on the evening of Thursday September 1st.

In addition to the Named Lectures there are four invited General Lectures of a review nature. These are "Flight Systems-Man/Machine Interface in the Computer Age" by Professor S J Merhav of Israel, "Technologies for Future Transport Aircraft" and "The Technology of the A320 Aircraft" by M J Roeder and J P Potocki both of Airbus Industrie, France, "Emerging Hypersonic Propulsion Technology" by T Curran, USA, and "Advanced Turbo-Props" by J A Ziemianski, USA.

As already remarked the main body of papers are presented in six parallel sessions and every effort has been directed to the difficult task of ensuring as little overlap of interest as possible in lectures occurring simultaneously. About a quarter of the sub-sessions are

devoted to aerodynamics and aerodynamic design, including four concerned with a topic of major and growing importance - vortex flows, structures, structural design and the related topics of aeroelasticity and fatigue occupy some seven sub-sessions, and a similar number of sub-sessions are concerned with aspects of flight mechanics including avionics and active control technology. Engine design and control and engine-airframe integration account for another five sub-sessions. About ten sub-sessions are devoted to the important subject areas of aircraft design and operation, including environmental safety and air traffic control, whilst hypersonics and hypersonic vehicle design occupy a further three sub-sessions. New materials, including metallic alloys and composites occupy seven sub-sessions, and finally a similar number are devoted to the increasingly important applications of computers, including computational fluid dynamics (CFD). It is hoped that every delegate will be able at all times to attend lectures of particular interest to him or her, and with the aid of these Proceedings will derive great benefit from the Congress.

On Wednesday August 31st a visit to the Israel Aircraft Industries is planned and there is a full program of sight-seeing tours arranged for accompanying persons during the period of the Congress.

It is with deep regret that I have to record that since the last Congress another of our founder members, Professor H J van der Maas, has died. He was one of the now dwindling band of colleagues of von Karman who established the main modes of international co-operation in aeronautics in the post-war years, modes that have proved so vital to the general progress of aviation. Professor van der Maas contributed

much to these developments and in particular to the success of ICAS.

On behalf of the Council of ICAS it is my pleasure to thank all the authors and lecturers who have contributed to the Congress, the technical quality as well as the quantity of the papers must constitute a record. I must also express my gratitude to those who kindly agreed to act as Chairmen of the various sub-sessions. They are all-important people whose time and services are much in demand and therefore doubly appreciated.

My special thanks go to the Chairman of the Israel Organising Committee (who is also the ICAS Immediate Past-President), Professor Josef Singer, to his Vice-Chairman, Professor Josef Shinar and to the other members of the Committee who were responsible for the choice of venue and the many social and domestic arrangements. Warm thanks are also due to the numerous 'helpers and servers' who attend to a great number of tasks, vital to such a Congress, that can, however, so readily pass unremarked.

The work of the Program Committee is, of course, of prime importance to the success of the Congress. It extends from the preparation of the Call for Papers to the careful selection and sorting into sub-sessions of the submissions to achieve a cohesive and interesting program. To Professor Santini, Chairman of the Program Committee, and all the members of his Committee must go our most grateful thanks for achieving such an excellent result.

It is also my deep desire to express my most cordial gratitude to Professor Alec D Young who serves for ICAS as its Executive Secretary since our last Congress very successfully. Being one of the most prominent scientists in aeronautics himself, his personal engagement in guiding the everyday work of ICAS is a visual sign of acknowledgement ICAS finds in the scientific community.

I also want to extend my thanks to the Royal Aeronautical Society which took over the Secretariat from the Deutsche Gesellschaft für Luft- und Raumfahrt e.V. (DGLR) two years ago. Its strong support and continuous interest is of utmost importance for the prosperity of ICAS. Furtheron, may I express appreciation for the invaluable services of Mrs Mary Stuart, the ICAS Secretary, who very efficiently managed the tremendous workload involved in the preparation of this meeting as well as the friendly help of my own secretaries, Mrs Helga Will and Mrs Marlis Krimm.

Boris Laschka

President.