Canadian Aeronautics and Space Institute
Institut aéronautique et spatial du Canada

***** FOR IMMEDIATE RELEASE *****
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CANADIAN AERONAUTICS AND SPACE INSTITUTE ANNOUNCES 2022 SENIOR AWARD HONOUREES

Dr. Harry Kowal, President of the Canadian Aeronautics and Space Institute for 2020-22, has announced the honourees of the 2022 CASI Senior Awards.

The Awards and the recipients are:

1. CASI McCurdy Award
   Dr. John Moores, York University
2. CASI C.D. Howe Award
   Mr. François Caza, Bombardier Aerospace (retired)
3. CASI Alouette Award
   Spacecraft Reverberant Acoustic Chamber Facility Team, National Research Council

The criteria for each of the Senior Awards discerned in 2022 and summaries of the accomplishments of the honourees are found below.

Presentation of the Awards to those honourees who can attend, will be made at the CASI Senior Awards Gala Dinner to be held at the Delta Montréal Hotel on the evening of November 2, 2022.

For more information, please contact the headquarters of the Canadian Aeronautics and Space Institute at (613) 591-8787.

. . . details on the following pages . . .

The CASI McCurdy Award

The McCurdy Award was introduced in 1954 by the Institute of Aircraft Technicians, one of the aeronautical groups that amalgamated to form the Canadian Aeronautics and Space Institute. The award commemorates the many engineering and other contributions made by John A.D. McCurdy during the first stages of the development of an aviation industry in North America.

The award is presented for outstanding achievement in the science and creative aspects of engineering relating to aeronautics and space research. The achievement must constitute the most significant contribution made in recent years toward the advancement of science and technology in aeronautics and space exploration and must be worthy of special recognition. The contribution may be administrative in nature, but it must be directly related to science and technology, and have been sustained over a number of years at an imaginative and creative level above that which would normally be considered a competent and successful performance. The recipient shall have been a Canadian citizen at the time the contribution was made.

Professor John E. Moores

Professor John Moores has made major contributions to the development of Canada's space program with his projects and discoveries. His outstanding contributions to space research through developing space instrumentation are exceptional and demonstrate a wide breadth of sustained contributions over the past five years. His work has taken underdeveloped and conflicting observations from exploration missions and has creatively turned those observations into meaningful conclusions about the Moon, Mars, and Pluto.

Dr. Moores proposed revolutionary and innovative theories regarding the atmosphere of Mars that unified a previously divided community across North America and Europe. Prior to his contributions, there were studies conducted by leading space scientists in both NASA and the European Space Agency that had conflicting observations on the presence of methane in the Martian atmosphere. Dr. Moores developed a model of the Martian atmosphere that explained how both observations could be correct. This work led to his being invited to the pivotal methane panel at the 9th Mars Conference in Pasadena, California, held in 2019, and has led to the development of the CSA-funded Martian Atmospheric Gas Evolution (MAGE) project which aims to conclusively prove his model. Prof. Moores, is serving as the scientific lead on this exciting project in collaboration with the University of Toronto, McGill University and ABB, Inc.

John Moores's expertise in planetary atmospheres extends as far as Pluto. In 2017 his publication "Penitentes as the origin of the bladed terrain of Tartarus Dorsa on Pluto" was published in Nature and is another example of his ingenuity in untangling complex planetary science puzzles. Again, underdeveloped observations from spacecraft had left space scientists confused about the origins of a particular landform of Pluto. Created from methane ice, these features greatly resemble much smaller water ice features in glaciers on Earth. Once again Dr. Moores proved that these two observations were interconnected, as both features were formed through the same process.

John Moores also has developed an instrument that uses camera technology to facilitate the detection of lunar ice, advancing exploration of the moon that is one of the major space initiatives being pursued by the Canadian government. This project is approaching potential flight dates as early as the mid-2020s on several different lunar rovers.

These scientific accomplishments have seen Professor Moores recognized as an elite researcher in planetary science. Since 2015, he has accumulated over 6800 citations across 82 scientific publications including Science and Nature. The space science community has recognized his work through two selections as a participating scientist on NASA's Curiosity rover and he and his trainees have received the NASA Group Achievement award 16 times. Professor Moores has been recognized with several prestigious honours in addition to the 2022 CASI McCurdy Award. He was elected in 2018 as a Member of the New College of Scholars, Artists and Scientists of the Royal Society of Canada; in 2016 he received the Early Career Research Award from the Province of Ontario; and in 2019 he was appointed York Research Chair in Space Exploration.

Beyond his research accomplishments, Dr. Moores has become a national leader in Canada in the exploration of planetary atmospheres. He has twice (2015-2016, 2016-2017) been named Chair of the Canadian Space Agency's Planetary Exploration Consultation Committee, which advises the government on Planetary Exploration Policy. He was also the Chair of the Canadian Space Agency's Planetary Atmospheres Topical Team, which was charged with developing new policy in this area.

… excerpted/adapted from the nomination by Dr. Gordon G. Shepherd

The CASI C.D. Howe Award

In 1966 CASI introduced the C.D. Howe Award in honour of The Right Honourable C.D. Howe. The Award is presented for achievements in the fields of planning and policy making, and overall leadership in Canadian aeronautics and space activities.

The achievement for which the award is given shall be of permanent significance, and its benefits to aeronautics and space activities in Canada shall have been unquestionably established. To this end, the recipient shall have sustained an outstanding personal performance in these fields for at least ten years and it shall be reasonably certain that the merits of his achievements will be unassailable in the light of history. The recipient shall have been a Canadian citizen and resident during the time the contribution was made.

Mr. François Caza

François Caza retired in February 2021 as Chief Technology Officer of Bombardier, capping a distinguished 37-year career with the company. François' contributions to Bombardier were significant and many. He played a critical role in the development and certification of nearly every Bombardier commercial and business aircraft in the company's history. In 2014, François was appointed Bombardier's Chief Engineer and Head of Product Development Engineering, overseeing all aerospace engineering activities. Succeeding John Holding in this role, he oversaw the simultaneous development and certification of two of the world's most advanced aircraft in service today, the Global 7500 and the Airbus A220 (formerly known as the Bombardier C Series).

François Caza oversaw Core Engineering, Integrated Product Development Teams, the Bombardier Flight Test Center, Product Integrity and Airworthiness as well as Strategic Technology and Advanced Product Development. He was responsible for a large engineering organization with staff in four different locations: Montréal, Toronto, Wichita and Belfast. As Head of the Design Approval Organization (DAO) of Bombardier, he oversaw the certification and continued airworthiness for all Bombardier aircraft. The excellent safety record of Bombardier products is a testimony to his skills in building a world-class safety management system at the company.

Mr. Caza's influence also reached the research and education communities. He supported the creation of the Joint Master's Degree in aerospace engineering at seven universities in Québec. These universities and the participating industries formed a Coordinating Committee, CIMGAS, of which he was Chairman for several years, to arrange for industrial internship and case study courses for students and to implement

specific program developments to meet the needs of the aerospace industry. He also supported the establishment of an Aerospace Bachelor's degree at Ecole Polytechnique de Montréal, sending more than 16 of his engineers to teach courses at the University every year.

For many years he was Chairman of the Concordia Institute for Aerospace Design and Innovation and was a long-time member of the executive board of CRIAQ (Consortium de Recherche et Innovation en Aérospatiale au Québec). He was also a member of the board of Aéro Montréal and chairman of the Chantier Innovation for several years.

In 2012 the federal government launched the Aerospace Review headed by the Hon. David Emerson. For a year, a commission consulted all sides of the aerospace industry, seeking to advise the federal government on the best course of action to maintain and enhance the competitiveness of the Canadian Aerospace Industry. The Technology and Innovation Working group was co-chaired by John Saabas of Pratt & Whitney and François Caza of Bombardier. The working group produced its report in September 2012 and the Aerospace Report was handed to the Minister in November 2012. Several of the measures recommended in this Report were directly implemented by the government, measures that have affected how Canadian Aerospace works for years.

François Caza's contributions to multiple aircraft programs are certain to go down in the history of the Canadian aerospace industry as one of the greatest and most concrete examples of leadership in the field of Canadian aerospace planning and execution. His achievements in building a world-class engineering organization at Bombardier and in the broader aerospace community are of permanent significance, and the benefits to aeronautics and space activities in Canada have been widely and repeatedly recognized.

… excerpted/adapted from the nomination by Dr. Fassi Kafyeke

The CASI Alouette Award

CASI created the Alouette Award to recognize an outstanding contribution to advancement in Canadian space technology, application, science or engineering. The CASI Alouette Award may be presented to an individual, to a group, an organization or group of organizations, as appropriate to the nature of the contribution.

The terms are:
a) The trophy shall be awarded annually for an outstanding achievement in the field of astronautics as defined by the CASI By-Laws.

b) The achievement may be either a single outstanding contribution or, in the case of an individual nominee, a sustained high level of performance resulting in several advances in space.
c) The contribution on which the award is based must be recognized as a Canadian-led space endeavour or as a significant Canadian contribution to an international program.
d) Preference shall be given to contributions that lead to new benefits for mankind.
e) The recipient shall have been a Canadian citizen at the time the contribution was made.

Spacecraft Reverberant Acoustic Chamber Facility Team, NRC

Random vibration of spacecraft which is induced by acoustic emissions from the launch vehicle at lift-off is a prime structural design driver. In order to qualify the design for launch, spacecraft are subjected to acoustic environment loading to simulate the launch condition which is generally of the order of 140 dB or higher inside a payload fairing. This acoustic environment is most commonly generated in an acoustic reverberant chamber designed to simulate the noise environment of launch which is random in nature. However, since this noise environment is difficult to generate accurately, large tolerances on octave band component amplitude are generally allowed. As a result, the spacecraft must be designed to higher structural safety margins than might be necessary to accommodate this wide tolerance, which increases launch mass and complexity of the spacecraft to sustain the environment.

The National Research Council's (NRC) Aerospace Research Centre maintains and operates a large (26 x 23 x 32 ft) high-intensity reverberant acoustic chamber test facility for the development, qualification, and acceptance testing of full-scale spacecraft hardware. This is the only acoustic chamber facility in Canada capable of testing full-scale space structures in an intense noise environment representative of that found within a rocket fairing during the launch. Most spacecraft and components manufactured by the Canadian space industry for commercial and government needs are tested at the NRC acoustic chamber facility, which has been in operation since 1982 and provides a crucial Assembly, Integration and Test capability to complement other test facilities at the David Florida Laboratory operated by the Canadian Space Agency.

As mentioned above, it is difficult to accurately simulate the random noise environment which can also be influenced in a non-linear manner by the damping of the test article. Furthermore, the noise generators also are fundamentally nonlinear with respect to their input-output characteristics. Initial testing was done using manual adjustment and scaling factors on the noise environment which was not only difficult but required

large tolerances to achieve the required acoustic environment. To overcome this difficulty, a hardware- and software-based real-time Acoustic Spectrum Control System (ASCS) was designed and implemented in the early 1990's which greatly improved the capability. But after 25+ years of service, the ASCS hardware had become obsolete.

The NRC's Spacecraft Reverberant Acoustic Chamber Facility Team, consisting of the nominees, addressed the challenge by developing a newer generation of Acoustic Spectrum Control System (ASCS) in-house to enhance the capability of the NRC large spacecraft reverberant chamber facility. Compared with other commercial ASCS software, the NRC proprietary software enabled quicker convergence and higher accuracy of the acoustic field in the chamber, which minimizes the unnecessary exposure of high levels of acoustic loading of the spacecraft during test set-up. In addition, it also introduced new safety features such as automatic elimination of faulty control microphones and energy limits on critical control bands.

This new ASCS system enables efficient operation of the facility by automating sensor calibration and automatically generating required reports at the end of the test sequence, allowing for quick turnaround for tests to meet strict schedules in the space industry. Since its commissioning in 2015, the new ASCS has advanced Canadian AIT capability, successfully completing more than 50 acoustic qualification tests for clients.

The enhanced control accuracy and safety of the new ACSC of the NRC Spacecraft Reverberant Acoustic Chamber Facility enables Canadian spacecraft manufacturers to design more optimal spacecraft structures to meet launch environment specifications and to offer superior spacecraft designs for Canadian and international space programs. Since its commissioning, successful acoustic qualification tests have been completed on three RADARSAT Constellation Mission (RCM) spacecraft and many large satellite antennae and reflector assemblies for clients. The new system is able to achieve the tightest tolerance among the major acoustic facilities worldwide, enabling customers to design lighter structures while meeting or exceeding other tight specifications demanded by their users within the global spacecraft market. Furthermore, these new enhancements have also contributed to the success of their space projects by reducing the turnaround time for tests and providing flexibility to accommodate changes in schedule due to unforeseen technical challenges. The NRC's Spacecraft Reverberant Acoustic Chamber Facility has proven to be a critical advantage for Canadian companies to maintain their lead in the space industry and continue to provide superior products in order to win competitions for international space programs.

The Spacecraft Reverberant Acoustic Chamber Facility Team members are:

Dr. Viresh Wickramasinghe
Dr. Anant Grewal
Dr. Yong Chen
Mr. Brent Lawrie
Mr. Shahrukh Alavi
Mr. Luc Hurtubise
Mr. Christophe Legare
Dr. Sebastian Ghinet
Mr. Devon Downes
Mr. Antal Prigli

… excerpted/adapted from the nomination by Dr. David Zimcik

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