

# DEPARTMENT OF MECHANICAL ENGINEERING

## WILLIAM MAXWELL REED SEMINAR SERIES

### “Small UAS and Delivery Drones: Challenges & Opportunities”

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University of Maryland

**Abstract:** During the past one-decade, there has been phenomenal growth of small-unmanned aerial systems (UAS) for hobbyists and rapidly expanding commercial and military applications. Impetus for this dramatic expansion has been due to explosion of mobile technology in terms of microelectronics, data processing and transmission capability, superior batteries, miniaturized integrated programmable chips, and innovations in computer vision and videography/photography. However, there are many challenges to overcome before these small UAS can be used for routine commercial and military applications, which include sizable payload and range, stringent navigation/guidance requirements, and precision takeoff/landing and robust autonomous flight in constrained and low-altitude gusty environment. The objective of this presentation is to cover state-of-the-art of small UAS and delivery drones, identify technology gaps and key scientific barriers, and present future research needs for high payoff applications.

**Bio:** Dr. Inderjit Chopra is a Distinguished University Professor and Alfred Gessow Professor in Aerospace Engineering, and Director of Alfred Gessow Rotorcraft Center at the University of Maryland. He received his Doctor of Science (Aero & Astro) from MIT in 1977 and joined NASA Ames/Stanford University Joint Institute of Aeronautics & Acoustics, where he worked for four and half years on the development of aeroelastic analysis and testing of advanced helicopter rotor systems. In 1981, he joined the University Maryland and became the founding member of Rotorcraft Center of Excellence at Maryland and has been working on various fundamental problems related to aeromechanics of helicopters including advanced designs, aeroelastic stability, active vibration control, composite blades, smart structures, micro air vehicles and delivery drones, and comprehensive aeromechanics analyses. His direct graduate advising resulted in 57 Ph.D. and over 100 M.S. degrees, and his students are now playing dominant role in rotorcraft industry, academia and federal labs. An author of a textbook on smart structures theory, 225 archival journal papers and 420 conference proceedings papers, Dr. Chopra has been an associate editor of the Journal of the American Helicopter Society (1987-91), Journal of Aircraft (1987-cont.), Journal of Intelligent Materials and Systems (1997-2014) and International Journal of Micro Air Vehicle (2013-cont.). He was awarded the 2002 AIAA SDM Award, 2002 AHS Grover Bell Award, 2001 ASME Adaptive Structures and Material Systems Prize, 2004 SPIE Smart Structures & Materials Lifetime Achievement Award, 2009 AHS Alexander Klemin Award, 2012 AHS Igor Sikorsky International Trophy, 2016 ASME Spirit of St. Louis Aviation Medal and 2018 AHS Nikolsky Honorary Lectureship. He has been a member of the Army Science Board (1997-2002, 2019-cont.), NASA (NRC) Aeronautics and Space Engineering Board (2007-12) and NASA (NRC) Research and Technology Roundtable Board (2011-15). He is a Fellow of AIAA, a Fellow of AHS, a Fellow of ASME, and an Honorary Fellow of AHS.

**Date: Friday, Nov. 8<sup>th</sup>**

**Place: CB 106**

**Time: 3PM**

**Contact: Dr. Alexandre Martin 257-4462**

Meet the speaker and have refreshments  
Attendance open to all interested persons