



BRAVING THE WIND—TOWARDS A SAFE LOW-ALTITUDE TRANSPORT WITH AERODYNAMIC TESTING, DIGITAL TWINS, AND OPTIMIZATION

The rapidly evolving low-altitude economy transforms mankind into an aerial society: Drones and air taxis allow unprecedented transport and mobility overcoming traffic jams in congested metropolises and reaching remote rural destinations. Yet, drones and air taxis are far from aerodynamically optimized. More importantly, steady winds and wind gusts challenge the safety of air taxi and delivery drone operation in urban environments. These winds lead to unintended displacements and may result in potential collisions and accidents.

In this talk, we report on aerodynamic technologies and artificial intelligence addressing these wind safety challenges and improving aerodynamic performance for multicopter drones and air taxis. Topics include emulating atmospheric flow conditions in our aerial city lab, digital twins of drones and air taxis, aerodynamic optimization for cruise and wind-aware flight control for take-off and landing.

This lecture is based on work of Prof. Noack's team in collaboration with DongTeng Technology and SZUAVIA as well as the teams of Profs. Tamir Shaqarin, Franz Raps, Nan Gao, Xiaozhou He, Hao Xiong, Hongwei Zhang, Stefano Discetti and Andrea Ianni.



27 July, 2026 (Mon)



3:00 pm



YEUNG-P4701

Bernd R. Noack, Fellow of the American Physical Society, is National Talent and Distinguished Professor at Shenzhen University with secondary affiliations at Shenzhen Technology University, Harbin Institute of Technology, TU Berlin and University Carlos III of Madrid. In Shenzhen, he heads a team with dedicated laboratories for the aerodynamics problems of the low-altitude economy. For over three decades, he has worked on engineering turbulence control for transport vehicles in leading European and the US institutions, including the Max-Planck Society, German Aerospace Center (DLR), United Technologies Research Center (UTRC), TU Berlin and the French National Center for Scientific Research (CNRS).

Prof. Noack has written over 350 refereed publications, including 3 patents, 6 books and over 180 journal articles. His work has been awarded with many dozens of national and international awards. For instance, he won China's first NSFC pilot grant (ICFCRT) in Fluid Mechanics (only 25 awardees per year in all disciplines), became National Talent Professor in China and Fellow of the American Physical Society, got the first senior ANR Chair of Excellence in Fluid Mechanics, and was the only winner of the annual von Mises award 2005. His work includes 35 citation classics and enjoys over 20,000 citations with over 3000 citations per year (extrapolated for 2026). ScholarGPS rates him a No 1 fluid dynamicist in China and top 6 in the world. Mendeley/Stanford lists him as highly cited scientists among the top 10 aeronautics/aerospace scientists in China.



Speaker
Prof. Bernd R. Noack

College of Mechatronics and Control Engineering,
Shenzhen University, P.R. China
College of Urban Transportation and Logistics,
Shenzhen Technology University, P.R. China
Institute of Low-Altitude Science and Technology,
Harbin Institute of Technology, P.R. China
Department of Aeronautics Engineering,
University Carlos III of Madrid, Spain

All are welcome

