

AAE FALL COLLOQUIUM SERIES

How to Build a Mach 25 Reentry Vehicle and Make History

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3:30PM-4:20PM ARMS B061**



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Abstract:

To build a commercial space product with lasting impact, entrepreneurial engineers first must gain insight into the new space economy, build a strong team, and develop a robust vehicle. As the Head of Aerodynamics of Varda Space Industries, Dr. Kulakhmetov will share perspectives on current trends in the commercial space industry, historical mistakes, and potential future market opportunities. He will elaborate on the critical development stages of building a vehicle that can survive launch, operate autonomously in space, survive reentry, and receive the first-ever commercial license to land on US soil.

Biography

Dr. Marat Kulakhmetov was part of the founding team of engineers to join Varda Space Industries, where he currently leads the Aerodynamics department. While at Varda, Dr. Kulakhmetov has helped architect the W-Series manufacturing and EDL mission, develop the reentry aeroshell, and contributed to the design of critical tools required to fly the capsule such as: 6DOF simulations, aerodynamic/aeroheating databases, flight safety solvers, and more. He worked to establish the Varda Hypersonic Testbed program, which will support fundamental science and flight qualification of hypersonic DOD and NASA payloads, offering real world flight heritage for unique environments that cannot be simulated on Earth.

Prior to Varda, Dr. Kulakhmetov worked as a Sr. Propulsion Research Engineer at Blue Origin, where he helped architect the BE-7 LOX/LH2 lunar lander engine, the BE-3U-II LOX/LH2 upper stage engine, ran trade studies for future Blue Origin programs, and developed analysis tools for engine/vehicle/mission optimization, modeling evolution of stresses within additive parts, and more. Dr. Kulakhmetov is a graduate of Purdue university, where he studied high enthalpy interactions within hypersonic shock-layer flows.