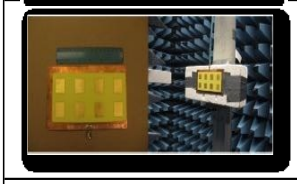
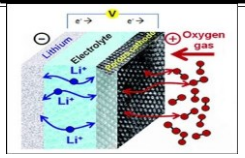
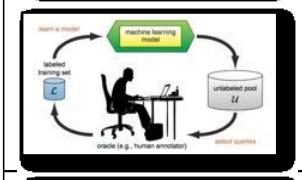
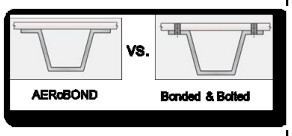
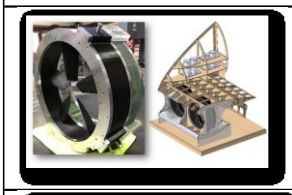
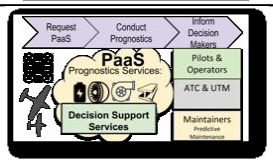
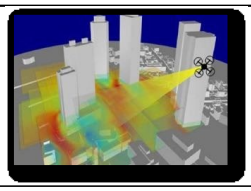
NASA Aeronautics Research Venture Capital Opportunity

Convergent Aeronautics Solutions (CAS)

The goal of NASA's Convergent Aeronautics Solutions (CAS) Project is to rapidly assess the feasibility of novel concepts with potential to transform civil aeronautics and determine whether additional investment is warranted. Concepts that prove feasible are expected to transition into more focused technology development projects to mature and apply the enabling technologies.

CAS Showcase is holding a Showcase on 18-19 September at NASA Ames Research Center where attendees will get the opportunity to see concepts and related technologies focused on transforming aeronautics (summarized below).

	Autonomy Operating System for Unmanned Aerial Vehicles (AOS4UAVs) – Building an open-standard platform that can verify and certify reusable software needed to develop smart UAV autonomy apps.
	Mission Adaptive Digital Composite Aerostructure Technologies (MADCAT) – Exploring the idea of using emerging digital composite manufacturing methods to build an ultra-lightweight, adaptable wing.
	Compact Additively Manufactured Innovative Electric Motor (CAMIEM) – Developing new innovative electric motor topologies enabled by additive manufacturing that significantly increase the state-of-the-art in electric motor power densities.
	Conformal Lightweight Antenna Structures for Aeronautical Communication Technologies (CLAS-ACT) – Developing a conformal microwave antenna based on an ultralight and thin aerogel that can conform to the aircraft's contours—avoiding interference, reducing drag, fuel burn and emissions.
	~~Fostering Ultra-Efficient, Low-Emitting Aviation Power (FUELEAP)~~ – Leveraging technology convergence in high-efficiency Solid Oxide Fuel Cells (SOFC), high-yield fuel reformers, and hybrid-electric aircraft architectures to develop tightly integrated power system producing electricity from hydrocarbon fuels at twice the combustion efficiencies.
	~~Lithium Oxygen Batteries for NASA Electric Aircraft (LION)~~ – Investigating feasibility of designing ultra-stable electrolytes that are resistant to decomposition so that batteries last longer, allowing electric-powered aircraft to fly farther.
	~~Spanwise Adaptive Wing (SAW)~~ – ~~Increasing aircraft efficiency by~~ articulating outboard portions of the wing using shape memory actuators to allow the size of the rudder to be reduced while maintaining stability.

	Autonomy Teaming & TRAnsparency for Complex Trusted Operational Reliability (ATTRACTOR) – Building a basis for certification of trustworthy multi-agent autonomous systems based on explainable AI (XAI), persistent modeling, and simulation, and mission planning and execution with analyzable trajectories.
	Fit to Fly (F2F) – Using a combination of automated monitoring, inspection, and testing to create an auditable system to determine whether aircraft have sufficient airworthiness to perform their intended missions.
	Toward a Safe and Secure Future of Aviation through Quantum Communication and Computation (QTech) – Harnessing the power of quantum computing for optimization and key distribution to assure reliability of communications needed for traffic management of autonomous aircraft networks.
	AdhEsive fRee BONDing of Complex Composite Structures (AERoBOND) - Seeking to increase manufacturing rate of composite airframes using a joining method with reduced dependence on redundant mechanical fasteners and improved *reliability* and *manufacturability* over currently available methods.
	Aqueous, QUick-charging battery Integration For Electric flight Research (AQUIFER) - Exploring a novel integration concept using nano-electrofuel (NEF) aqueous batteries and rim-driven motors (RDM) to retire fire and explosion hazards, decouple power and energy, and reduce EMI and noise for multiple electrified aircraft configurations.
	High-Efficiency Electrified Aircraft Thermal Research (HEATheR) - Exploring the feasibility of managing the waste heat on a megawatt-level electric aircraft propulsion system while achieving performance and operational cost benefits.
	TAiloRing Materials and Manufacturing AutomatiCally (TARMMAC) - Exploring the use of clear box data science and high-performance computing to streamline the development of additively manufactured aeronautics structures.
	Prognostics as a Service (PaaS) – Exploring the idea of leveraging cloud resources to provide wide access to precise and timely system failure prediction (prognostics) information to improve decision-making capabilities.
	MAchine learning ESTimations for uRban Operations (MAESTRO) - Enhancing the safety and efficiency of urban UAS operations by providing onboard estimation of urban winds through machine learning and commodity airborne sensors without requiring GPS.