



NASA SBIR 2015 Phase I Solicitation

S3.04 Unmanned Aircraft and Sounding Rocket Technologies

Lead Center: GSFC

Participating Center(s): AFRC, ARC, GRC, JPL, KSC, LaRC

Breakthrough technologies are sought that will enhance performance and utility of NASA's Airborne Science fleet with expanded use of unmanned aircraft systems (UAS). Novel airborne platforms incorporating tailored sensors and instrumentation suitable for supporting specific NASA Earth science research goals are encouraged. Additionally, innovative subsystem elements that will support existing or future UAS are desired. Concepts should include a clear outline of steps planned to complete all relevant NASA and FAA requirements. Potential concepts include:

- Novel Navigation Systems (terrain following for example).
- Autonomous Mission Planning.
- One month endurance small UAS for miniature (~2 lb) instrument packages scalable to larger platforms.
- Novel propulsion concepts that will expand the flight envelope.
- Small UAS in-situ cloud measurement capabilities.
- Autonomously Linking UAS.
- Novel flight management approaches such as dynamic soaring.
- Guided Dropsondes.
- Airspace monitoring system for small UAS operations.
- Modular air vehicle systems for optimization for specific missions.
- Systems for air/ash sample return from volcanic plumes.
- Miniaturized over-the-horizon communications systems with increased bandwidth.

Sounding Rocket Technologies

The NASA Sounding Rockets Program provides low-cost, sub-orbital access to space in support of space and Earth sciences research. NASA utilizes a variety of vehicle systems comprised of surplus and commercially available rocket motors, capable of lofting scientific payloads of up to 1300lbs, to altitudes from 100km to 1500km. NASA launches sounding rocket vehicles worldwide, from both land-based and water-based ranges, based on the science needs to study phenomenon in specific locations. Of particular interest are systems that will enable water recovery of payloads from high altitude flights from locations such as launch ranges at Wallops Island VA or Andoya, Norway. Specific elements may include:

- High speed decelerators.
- Steerable high altitude parachute systems.
- Water recovery aids such as floatation devices, location systems, and robotic capabilities.
- Ruggedized over-the-horizon telemetry systems with increased bandwidth.

