SSPO - PURPOSE

• It all begins with Science......

• Support GSFC’s science community
  – SmallSat’s can achieve great science at minimal cost
  – SmallSat opportunities are plentiful
  – SmallSat’s offer solutions to otherwise unaffordable science

• Small Satellite Project Office will support Goddard’s SmallSat Missions
  – From concept through mission operations
  – Project management, engineering, and project support
    • In-house, collaborations, industry, academia
• CubeSats and SmallSats (C&S) and related technologies enable innovative science and missions

• The C&S market is growing rapidly across all sectors (civil government, business, universities, military)

• Goddard has the broad scientific and engineering excellence needed to successfully utilize C&S for NASA’s mission

• Goddard has a growing set of C&S activities, ranging from individual CubeSats to proposals for constellations

• C&S are a key part of the future for Goddard and NASA, among the full spectrum of platforms

• Many funding opportunities are available (SMD, STMD, HEO, partnerships) for C&S science and technology

• Because Goddard is optimized to design and build larger missions, a different organizational strategy is needed for success with C&S at Goddard
NASA is Enabling the Community’s use of SmallSats to Help Answer Humanity’s Big Questions

How did the universe begin? How is it changing? What is out there?

NASA Technology:
- SSTP technology investments
- Formation Flight, Propulsion
- Communications, ACS systems

NASA Exploration:
- Access to Space, SKGs
- CubeSat Launch Initiative
- SLS/Orion/Commercial

NASA Science:
- SmallSats in all solicitations
- Leveraging STMD technologies
- Augmenting Larger Missions
The SSPO will provide:

- **Unified awareness** of technical capabilities (technologies, labs, etc.)
- **Cross-campus collaboration** to leverage **complementary** strengths.
- **Flexibility** of technical, management, and risk approach
  - “Less than Class D”: “portfolio is successful”, individual missions bear known risks
- **Structural evolution** needed to support a reasonable C&S portfolio
- **Partnerships with other Centers**, Agencies, and Industry
- **Built-in vibrancy and renewal** in its supporting workforce
- **Focus and external visibility** for Goddard’s C&S science and technology efforts
- **Low-cost, quick-response** solutions for proposers and partners.
- **Proactive pursuit** of collaborations and opportunities
- **Cultural shift**, a robust CubeSat/SmallSat culture will spread and benefit all GSFC endeavors

- Past example is migration of Special Payloads Division personnel into larger 400 and 500 organizations 15 years ago

All will enable strong in-house capability in supporting Goddard-targeted science
ORGANIZATIONAL OBJECTIVES

- Support Goddard’s Science Community
- Enable success of current missions
- Achieve excellence in SmallSats
- Reduce fractionated support of SmallSats
- Understand the strengths and shortcomings of available COTS components
- Meet challenging budget and schedule constraints
- Minimize response time in a fast paced and rapidly changing environment
- Identify technology gaps that need to be addressed
- Enhanced technical knowledge, expertise, and experience
- Improvement of processes for future missions
- Establish a unified set of SmallSat processes and control measures
- Win new work and proposals
• Science, enabled by missions, is what NASA asks of Goddard, and what Goddard achieves

• C&Ss will enable more opportunities for scientific study
  – Tighter budgets mean more opportunity at the ‘low end’
  – More missions are possible when small, fragmented, or constellation conops are considered

And experience counts:

• Goddard has deep experience in the full continuum of missions, payloads, and instruments
  – From Sounding Rockets to Explorer-class to national flagship missions: (CLASP, IceCube, LDSD, CATS, ISSCREAM, GEDI, MMS, JWST)
  – Each category involves increasing levels of reliability, quality, risk management, technical maturity, and visibility

• Goddard has deep experience in the “space” between the “high end” and the “low end”
  – Suborbital Experience: Portfolios of many Simultaneous Missions, Flexible Planning, Resource Sharing, Risk-Aware but Tolerant, Tailoring,
  – Shuttle and Station Experience: 100+ Get Away Special (GAS) payloads, 26 Hitchhiker missions, 73 payloads including 8 deployed SmallSats
  – SmallSat Experience: In-house Pegsat test spacecraft, 5 in-house SMEXs, ST-5 Constellation (3 ‘microsats’)
  – Ongoing collaborations with many external agencies, universities, and organizations

• Goddard has deep experience in developing the technologies needed to solve C&S challenges
  – Collaborative / Constellation Operations
  – Radiation toleration
  – Communications technologies
  – Complete in-house spacecraft design, build, test, operate capability
  – Robust ongoing development of spacecraft technologies
  – Long history of collaboration with industry and academia on space flight missions
• Special Projects Office/850 Chief Position announcement closes tomorrow

• Position Descriptions completed for Deputy Project Managers (Greenbelt and Wallops)
  – Positions should be posted tomorrow, September 27

• Working with code 500 to assemble SmallSat Engineering Team
SUMMARY

- CubeSats and SmallSats can achieve great science

- Number of CubeSats and SmallSats is expanding rapidly

- Goddard has the science and engineering excellence to excel in this rapidly expanding field

- An organizational approach will enable success
  - Start up of the SSPO is underway

- Small Satellite Project Office can support your planetary science mission – from concept through mission operations