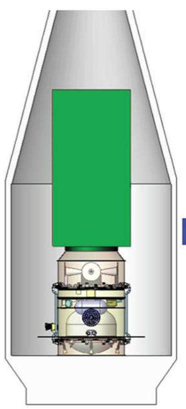
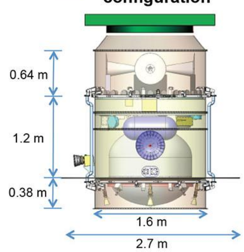
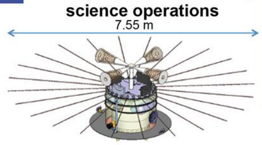
A DARE is compatible with the Atlas V (4m fairing shown below), Delta IV (4m), and Falcon 9 LVs (PLP shown in green)



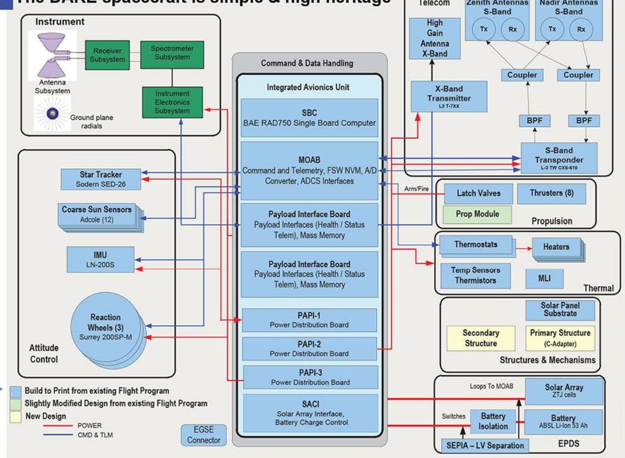
B DARE in launch configuration



C DARE configurations during science operations



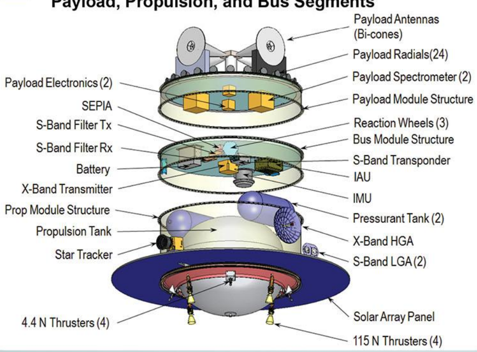
F The DARE spacecraft is simple & high heritage



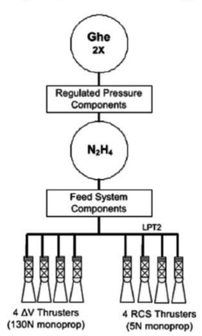
G Spacecraft Key Characteristics

Spacecraft Key Characteristics	
Operational Lifetime	Up to 3 month cruise, 2 years of science operations at the Moon
LV Compatibility	Compatibility with Atlas V, Delta IV, and Falcon 9 as a primary or secondary launch payload maximizes launch opportunities.
Redundancy	Class D payload per NPR 8705.4; Mainly single string with redundancy in critical areas including safe mode and battery charging
ADCS Architecture	3-axis stabilized, stellar inertial, with IMU backup; requirement of 0.24° knowledge & control over 10 minutes
Propulsion	Regulated monoprop system using four 115-N ΔV thrusters and four 4.4-N RCS thrusters for momentum control. 2,065 m/s ΔV budget
EPDS	Direct Energy Transfer, 3.9 m^2 body-fixed array, 53 Ah battery sized for 6.3 hour total lunar eclipse
Structure	3 stacked Lockheed Martin C-Adapters provide the primary structure. Use of modular construction and flight proven structural components and parallel integration of the Instrument, propulsion module, and S/C module reduces schedule risk.
EMI	EMI quiet bus. Faraday cage design provides over 100 dB of shielding over standard MIL-STD-461F emissions. RF risk reduction testing builds on BATC's experience with the DARPASat S/C to ensure an RF-quiet design for science data collection.
Telecomm	S-band omnis to NEN for cmd/tlm during all mission phases. X-band HGA to NEN for science data downlink at the moon. 1.7 GB/day of science+SOH data. Real time coverage for all critical events.
Avionics	Broad Reach (Moog) Integrated Avionics Unit with RAD750 processor
Thermal	Passively cooled with 0.7 m^2 radiator

D Modular bus allows concurrent integration of Payload, Propulsion, and Bus Segments



E Propulsion Functional Block Diagram (simplified for clarity)



H Mass growth contingencies & margins are large

Subsystem	CBE (kg)	Growth Contingency	Mature Mass (kg)
Structures	151.7	20%	182.7
EPDS	49.9	30%	65.1
C&DH	5.8	5%	6.0
Telecom	12.3	16%	14.3
Thermal	7.3	25%	9.1
ADCS	13.9	5%	14.6
Propulsion (Dry)	87.2	16%	101.5
Spacecraft Bus (Dry)	**328.0**	**20%**	**393.3**
Payload	**39.8**	**34%**	**53.3**
Flight System (Dry)	**367.8**	**21%**	**446.6**
Propellant	615.5	21%	747.4
Flight System (Wet) - Total Separated Wet Mass	**986.6**		**1,198.0**
Launch vehicle allocation (NTE)			**1,600.0**
Launch vehicle margin			**34%**

I DARE performance margins are substantial in all areas

Requirements and Margins	Requirement	Performance	Margin
Flight System Wet Mass	1,600 kg	1198 kg	34%
Science Data Storage Capacity	3.4 GB	4 GB	17 %
Power generation during science	254 Watts	361 W EOL	42%
Pointing Knowledge (3-sigma/per axis)	0.24°	0.17° *	41 %
Pointing Control (3-sigma/per axis)	0.24°	0.17° *	41 %
Propellant Tank Capacity	747 kg	959 kg	28%
EMI	-62.4 dBμV/m	-76 dBμV/m	13 dB

*During science data collection

J Power margins are adequate for all mission phases

Subsystem	Science Ops (W)	Safe Mode (W)
Command and Data Handling	31.5	31.5
Telecom	27.9	11.6
Thermal Control	36.5	46.6
Attitude Determination & Control	45.9	31.9
Power	4.2	4.2
Misc	2.1	2.1
Total Payload (CBE plus 30% contingency)	93.9	10.5
Total Flight System Loads with Losses	**254.4**	**144.1**
BOL Orbital Average Solar Array Capability	400.9	503.7
EOL Orbital Average Solar Array Capability	361.1	453.7
EOL Margin: (Allocation - MEV)/MEV * 100	**42%**	**215%**

Note:
- Values include contingency ranging from 5% to 30 % based on component maturity
- Battery sized at 53 Ah for maximum total lunar eclipse of 6.3 hours