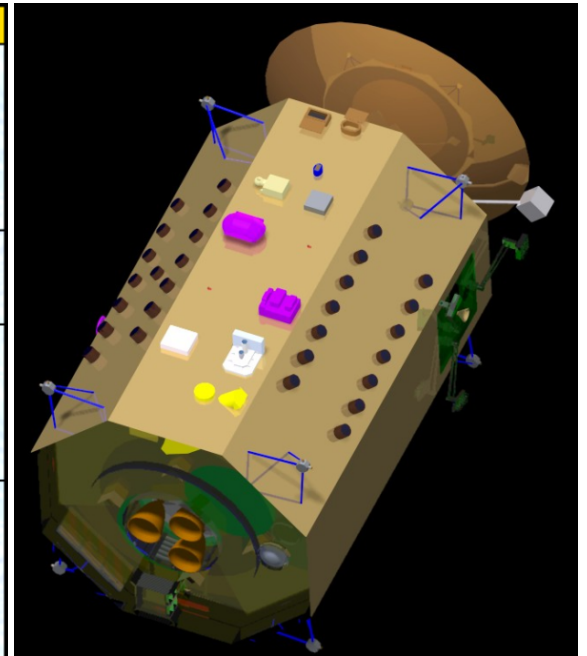


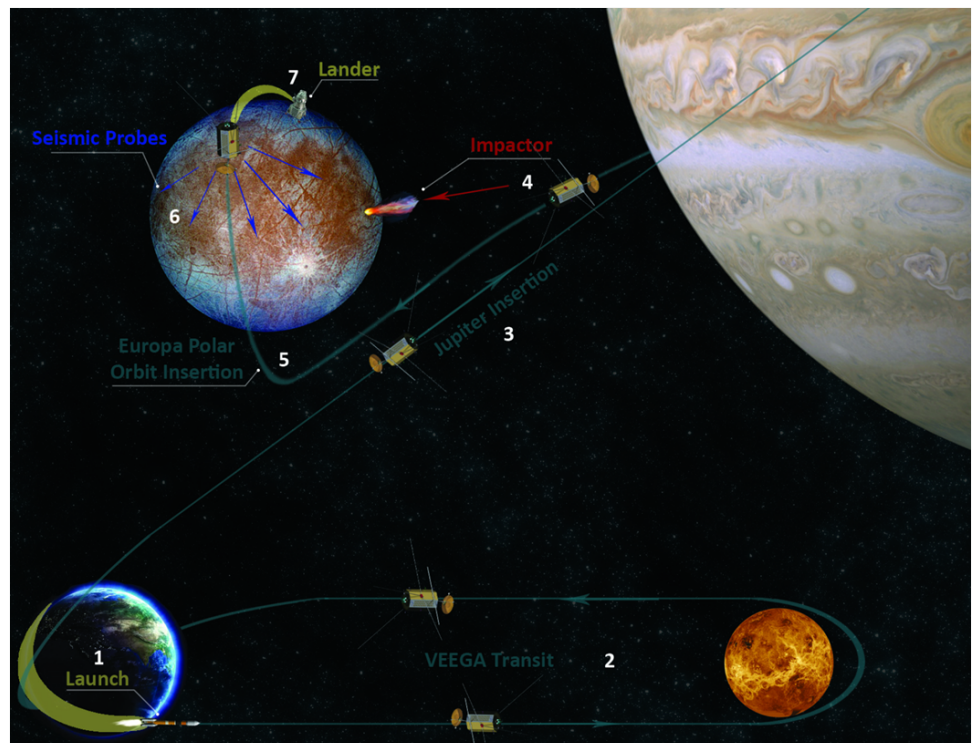
The ICSSS Mission

Inner Crustal Europa Seismic and Spectral Surveyor

Science Objective	Instruments
Characterize Europa's icy shell and any subsurface water as well as the nature of the surface-ice-ocean exchange Characterize and determine the extent of subsurface oceans and their relations to the deeper interior	Ice Penetrating Radar Seismic Probes
Characterize the deep internal structure, differentiation history and intrinsic magnetic field	Magnetometers Radio Science
Compare the exospheres, plasma environments and magnetospheric interactions	Radio and Plasma Wave Science Instrument Thermal Emission Imaging System Ion and Neutral Mass Spectrometer Magnetospheric Imaging System
Determine global surface compositions and chemistry, especially related to habitability	Near Infrared Mapping Spectrometer UV Spectrometer Seismic Probes Ion Neutral Mass Spectrometer Lander with Gas Chromatograph and Mass Spectrometer
Understand the formation of surface features, including sites of recent or current activity and identify and characterize candidate sites for future <i>in situ</i> exploration	Narrow angle camera Wide angle camera Near Infrared Mapping Spectrometer

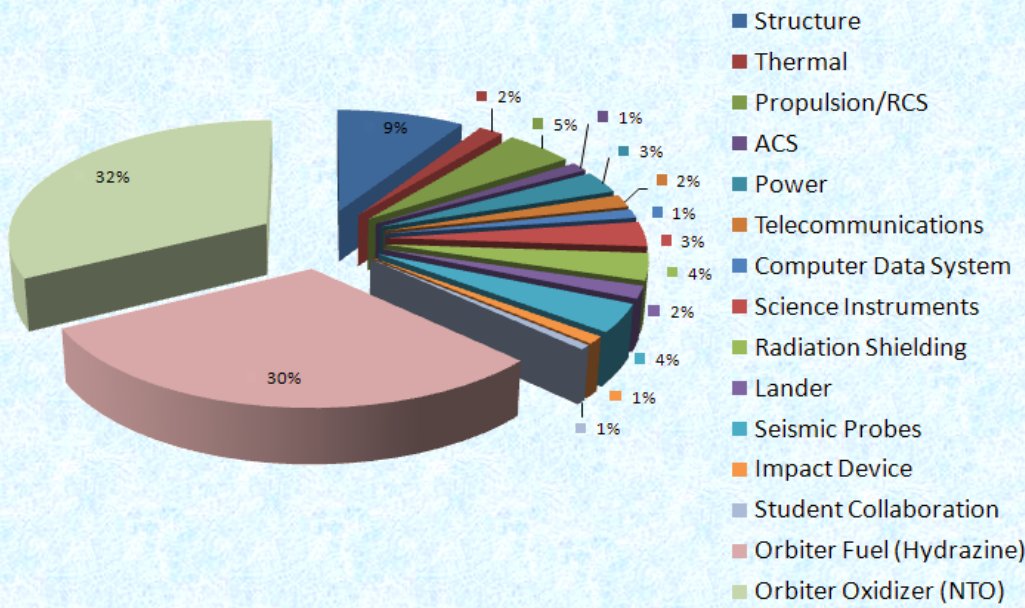


Launch Vehicle
Atlas V 551 with 4615kg capacity
Dry Mass
2006 kg (including 29% contingency)
Propellant Mass
1168kg of Hydrazine and 1252kg of NTO
Total Wet Mass
4492kg with 123kg of additional margin



Telecommunications
Frequencies
Ka-band and X-band
Antennas
3 meter parabolic high gain antenna 1 medium gain and 2 low gain antennae
Power Requirement
85 W

ICESSS Mass Budget



Propulsion System

ΔV Requirement

2260m/s

System

Hydrazine and Nitrogen Tetroxide

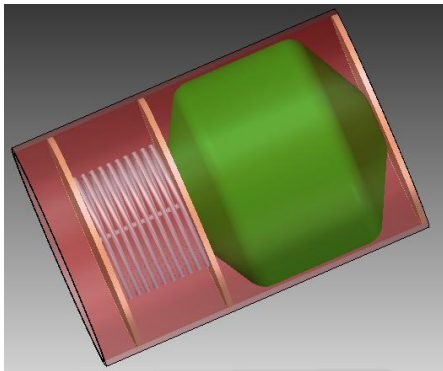
Dual mode system utilizing AMBR Engine

335s Isp for primary maneuvers

210s Isp for attitude control maneuvers

Power Budget (in Watts)

System	Standard Operations	Telecom Operations	Safe Mode
Scientific Payload	125	90	0
Thermal	0	0	0
ACS	49	49	49
CDS	51	51	51
Communications	50	85	85
Propulsion	5	5	5
Total Power (W)	280	280	190



Seismic Probes

Scientific Studies

Quantify tidal flexing

Determine fundamental surface composition

Hydrazine and Nitrogen Tetroxide

Ejection System

29 separate ejection canisters

Spring ejects probe with 50lbs of force

Release actuated by thermal knife

Team Eureka Mission Schedule

2020	2022	2024	2026	2027	2030
2 4 8 12	2 4 8 12	2 4 8 12	2 4 6 8 10 12	2 3 4 6 8 10 12	2 4 6 8 10 12
Launch					
Phase E					
Cruise 347 wks VEEGA Trajectory					
				Jovian Tour	
					Europa Orbit
2 4 8 12	2 4 8 12	2 4 8 12	2 4 6 8 10 12	2 3 4 6 8 10 12	2 4 6 8 10 12
2020	2022	2024	2026	2027	2030

Cost Allocation – Baseline Mission

Fixed Cost Element	Cost (FY2010\$)	Variable Cost Element	Cost (FY2010\$)
Launch Vehicle	\$68M	Orbiter	\$773M
Additional ASRG	\$27M	Lander	\$134M
NEPA compliance	\$20M		
Total	\$115M	Total	\$907M
Total Mission Cost: \$1022M			

