

The Shortwave ImageR and Spectrometer for Europa (SIRSE). A. A. Simon¹, D. Reuter¹, C. Olkin², S. A. Stern², J. Emery³, W. Grundy⁴, R. Hudson¹, J. Rathbun⁵, P. Schenk⁶ and R. Vervack⁷. ¹NASA's Goddard Space Flight Center, ²Southwest Research Institute, ³U. Tennessee, ⁴Lowell Observatory, ⁵Planetary Science Institute, ⁶Lunar and Planetary Institute, ⁷Johns Hopkins Applied Physics Lab.

Introduction: The SIRSE instrument provides two payload elements in one, reducing complexity, mass, and power, while providing flexibility in operations and accommodations. SIRSE will deliver an unparalleled scientific dataset of co-registered spectral imaging at 10-nm spectral resolution and panchromatic stereo data. It is based on extensive instrument heritage, including the New Horizons Ralph instrument, and leverages the strong partnership and experience of GSFC and SwRI in building and operating these instruments (Reuter et al. 2008. *Space Sci. Rev.* **140**, 129-154)

INSTRUMENT FACTS AND FIGURES	
Volume	
40.7 x 55.3 x 49.3 cm	
Mass	
Instrument (no shielding)	20.4 kg
Shielding	7.2 kg
Power	
Nominal	17.3 W
Peak	25.6 W
Spectrometer	
Wavelength Range	0.85 - 5.3 microns
IFOV	75 μ rad; 150 m @ 2000 km
Cross-track FOV	4.3 deg
Camera	
Wavelength Range	Panchromatic
IFOV	27 μ rad; 0.68 m @ 25 km
Cross-track FOV	7.7 deg

Science Objectives: SIRSE has been optimized to meet broad science goals for either a Europa flyby or orbiter mission:

Characterize ice shell and surface-ice-ocean exchange

- Map landforms at high vertical and horizontal resolution, with correlated spectral mapping

Determine surface composition and chemistry

- Map global composition, correlate geologic features with local composition, and search for key astrobiological & volatile spectral features

Understand surface features and search for active sites

- Study chaos, impact craters, double ridges and bands, search for active plumes and deposits, and provide upper limits on thermal anomalies

Understand magnetospheric-surface interactions

- Map hemispheric composition, search for radiolytic products in local geology, and determine surface radiative transfer properties

Characterize compelling landing sites and assess hazards

- Find sites with unique chemistry, search for sites with recent or current activity, and constrain local topography and slopes

