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## Libera and Continuity of the Earth Radiation Budget Climate Data Record

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The NASA Libera Mission, named for the daughter of Ceres in Roman mythology, will provide continuity of the Clouds and the Earth's Radiant Energy System (CERES) Earth radiation budget (ERB) observations from space. Libera's attributes enable a seamless extension of the ERB climate data record. Libera will acquire integrated radiance over the CERES FM6-heritage broad spectral bands in the shortwave (0.3 to 5  $\mu\text{m}$ ), longwave (5 to 50  $\mu\text{m}$ ) and total (0.3 to beyond 100  $\mu\text{m}$ ) and adds a split-shortwave band (0.7 to 5  $\mu\text{m}$ ) to provide deeper insight into shortwave energy deposition. Libera leverages advanced detector technologies using vertically aligned black-carbon nanotubes with closed-loop electrical substitution radiometry to achieve radiometric uncertainty of approximately 0.2%. Libera will also employ a wide field-of-view camera to provide scene context and explore pathways for separating future ERB missions from complex imagers.

The Libera science objectives associated with continuity and extension of the ERB data record are to identify and quantify processes responsible for ERB variability on various time scales. Beyond data continuity, Libera's new and enhanced observational capabilities will advance our understanding of spatiotemporal variations of radiative energy flow in the visible and near-infrared spectral regions. They will also enable the rapid development of angular distribution models to facilitate near-IR and visible radiance-to-irradiance conversion.

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