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We present preliminary results of a Spitzer program to observe the 5.2--38 micron spectra of small basaltic asteroids using the Spitzer IRS (Infrared Spectrograph). Our targets include members of the dynamical family of the unique large differentiated asteroid 4 Vesta (``Vestoids''), four outer-main-belt basaltic asteroids whose orbits exclude them from originating on 4 Vesta, and the basaltic near-Earth asteroid (NEA) 4055 Magellan. We will compare the compositions and thermophysical properties of the non-Vestoid objects with those of the dynamical vestoids to provide insight on the extent of metal-silicate differentiation on planetsimals during the epoch of planet formation in the early Solar System.

As of this writing, spectra of asteroids 10537 (1991 RY16) and 2763 Jeans have been returned. Analysis of these data are ongoing. Observations of 956 Elisa, 2653 Principia, 4215 Kamo, 7472 Kumakiri, and 1459 Magnya have been scheduled and are expected to be available by the time of the DPS meeting.

NIR spectra and lightcurves of the target asteroids are also being observed in support of this program.

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