

# A SURVEY OF KARIN CLUSTER ASTEROIDS WITH THE SPITZER SPACE TELESCOPE

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The Karin cluster is one of the youngest known families of main-belt asteroids, dating back to a collisional event only  $5.8 \pm 0.2$  Myr ago. Using the Spitzer Space Telescope we have photometrically sampled the thermal continua (3.5 - 22  $\mu\text{m}$ ) of 17 Karin cluster asteroids of different sizes, down to the smallest members discovered so far, in order to make the first direct measurements of their sizes and albedos and study the physical properties of their surfaces. The mean albedo is  $p_V = 0.215 \pm 0.015$ , compared to  $0.20 \pm 0.07$  for 832 Karin itself (for  $H = 11.2 \pm 0.3$ ), which strongly supports the view that the Karin asteroids are closely related physically as well as dynamically. The mean albedo is lower than expected for young, fresh "S-type" surfaces, suggesting that space weathering can darken main-belt asteroid surfaces on very short timescales. Our data are suggestive of a connection between surface roughness and albedo, which may reflect rejuvenation of weathered surfaces by impact gardening. While the available data allow only estimates of lower limits for thermal inertia, we find no evidence for the relatively high values of thermal inertia reported for some similarly-sized near-Earth asteroids. Our results constitute the first observational confirmation of the legitimacy of assumptions made in recent modeling of the formation of the Karin cluster.