# Laboratory Ground Truth for Space Remote Sensing: Asteroid Light Curve and Shape Model Simulation

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We introduce a full laboratory setup for obtaining the ground truth for space remote sensing. We can measure accurate lightcurves for a synthetic asteroidlike target, and we can determine a precise (sub-mm level) shape representation of it with a laser digitizer. Using a goniometer, we can also measure the scattering properties of the surface material. The scattering properties can also be studied by finding a scattering model that reproduces the measured lightcurves when using the scanner-based shape model for disk integration. We use a general functional series for the scattering model (rather than a physically oriented but still a semi-empirical one such as the Hapke model). This setup enables us to simulate real photometric measurements properly (without computational bias due to adopted numerical representations), and to calibrate the resulting models from inverse problem solution by comparing them to the full information we have on the shape and the scattering behaviour.