NEW PHOTOMAPS OF PHOBOS, DEIMOS, ITOKAWA, STEINS, WILD 2 AND TEMPEL 1. P. J. Stooke[1]. [1]Department of Geography and Centre for Planetary Science and Exploration, University of Western Ontario, London, Ontario, Canada N6A 5C2. pjstooke@uwo.ca.

Introduction. Global photomosaic maps of small bodies in standard projections are valuable for geological analysis, mission planning and visualization purposes. Recent datasets support the compilation of new maps of satellites Phobos and Deimos, asteroids Itokawa and Steins, and comet nuclei Wild 2 and Tempel 1. Here they are presented and the differences from earlier maps are described. All these maps have been or will be submitted to PDS-SBN.

Phobos. The best previous mosaic map of Phobos [1] consisted only of Viking images. Using that map as control, a new mosaic was constructed from improved Viking high resolution mosaics augmented by MRO HiRISE, MGS MOC and Mars Express HRSC images. The new images greatly improve areas not well seen by Viking. A new shape model and mosaic of HRSC images were derived by [2], but their mosaic is of lower quality so the new global mosaic described above was warped to fit the HRSC map control to create a second version of the Phobos map. Both versions have been provided to the Phobos Sample Return Mission.

Deimos. The best previous map [3] was a compilation of Viking and Mariner 9 images controlled by an earlier mosaic [4]. A new version of this mosaic was made by adding MRO HiRISE images and correcting a defect in the original mosaic. HiRISE allowed major improvements in the 40° E longitude area and smaller improvements south of the equator between longitudes 300° E and 360° E.

Itokawa. No photomosaic map of Itokawa in a standard projection has been available until now. 3D mapping [5] provided a basis for contructing a mosaic. First, rendered images of Gaskell's model with a latitude/longitude grid overlay [6] were used to create a global cylindrical mosaic of the rendered image products, using grid intersections as cartographic control points. Next, the resulting mosaic became the control for reprojection of individual Hayabusa images, using small rocks as control points. The rectified images were assembled into a global mosaic. Relief distortions on this very rocky object make this difficult, but a reasonable result with fairly uniform lighting has been achieved. The most serious problems occur in a small area under the 'chin' of Itokawa at -30° lat., 0° long., where radii intersect the surface more than once like a very large overhanging cliff in terrestrial cartographic terms. For this mosaic the problem is addressed artistically by averaging the slope over a slightly larger area to facilitate visualization, rather than by succumbing to excessive cartographic pedantry. A slope is created, covering the anomalous area, tilted enough to remove any ‘overhang’ problems. The actual surface is projected onto that slope along normals to that slope. Then the slope is projected onto the plane of the map.

2867 Steins. Only half of Steins was observed by Rosetta on 5 September 2008. [7] present a photomosaic in cylindrical projection controlled by a shape model. Here an improved mosaic is created from different processing versions of the same images, using the published map as control. The main difference is at the south pole, where a large crater is found. Here a ridge just beyond the large crater is interpreted as the rim of a second crater of similar size, as suggested by its motion relative to the first crater during the flyby.

81P/Wild (Wild 2). Comet Wild 2 was imaged by Stardust on 2 January 2004. Images with a simple ellipsoidal grid overlay were published by [8]. Those grids were used to create a preliminary semi-controlled cylindrical projection mosaic. More work is needed on this, but the result may be useful for visualization or active region analysis.

9P/Tempel (Tempel 1). Deep Impact imaged this comet nucleus on 4 July 2005. A shape model grid and mosaic were published by [9]. These were used initially to create a new version of the cylindrical projection mosaic map, but this was augmented by additional sources of information. Part of the area at the south pole beyond the terminator was faintly illuminated by light from the impact plume [9]. The appropriate images were reprojected to add to the global mosaic in this area. In addition, parts of the nucleus not seen in the approach images were viewed by the spacecraft during departure, allowing some additional coverage north of the equator. This region should also be seen by Stardust during its flyby early in 2011.

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Figure 1. New photomosaic maps of asteroid 2867 Steins and the nucleus of comet 9P/Tempel.