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A System of Technologies for Future Robust Deep Space Spacecraft

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There are not just one or two technologies that will substantially modernize and miniaturize spacecraft but a system of many new technologies that together will provide the next generation of small spacecraft for deep space missions (> 10 AU, 100-250 Kg dry mass, >15 years life time). This system of technologies will support flagship science class that require high performance, low-mass, low-power and long-life subsystems. The advent of the CubeSat has brought about changes in the way planetary spacecraft can and will be designed. CubeSats will not replace planetary spacecraft, but they have opened up the frontiers to developing robust miniaturized sub-systems and instruments for deep space applications. This presentation will discuss the many technologies that, combined, will enable the low cost planetary spacecraft of the future. These spacecraft will have substantial mass and power savings and will provide opportunities to do significant scientific measurements of solar system objects with a goal of developing the next spacecraft to leave our solar system. They may be solar powered or use RTG's but the system will enable low cost Discovery-class missions.