

Cubesat Antenna Design

Presents an overview of CubeSat antennas designed at the Jet Propulsion Laboratory (JPL) CubeSats--nanosatellites built to standard dimensions of 10cm x 10 cm x cm--are making space-based Earth science observation and interplanetary space science affordable, accessible, and rapidly deployable for institutions such as universities and smaller space agencies around the world. CubeSat Antenna Design is an up-to-date overview of CubeSat antennas designed at NASA's Jet Propulsion Laboratory (JPL), covering the systems engineering knowledge required to design these antennas from a radio frequency and mechanical perspective. This authoritative volume features contributions by leading experts in the field, providing insights on mission-critical design requirements for state-of-the-art CubeSat antennas and discussing their development, capabilities, and applications. The text begins with a brief introduction to CubeSats, followed by a detailed survey of low-gain, medium-gain, and high-gain antennas. Subsequent chapters cover topics including the telecommunication subsystem of Mars Cube One (MarCO), the enabling technology of Radar in a CubeSat (RainCube), the development of a one-meter mesh reflector for telecommunication at X- and Ka-band for deep space missions, and the design of multiple metasurface antennas. Written to help antenna engineers to enable new CubeSat NASA missions, this volume: * Describes the selection of high-gain CubeSat antennas to address specific mission requirements and constraints for instruments or telecommunication * Helps readers learn how to develop antennas for future CubeSat missions * Provides key information on the effect of space environment on antennas to inform design steps * Covers patch and patch array antennas, deployable reflectarray antennas, deployable mesh reflector, inflatable antennas, and metasurface antennas CubeSat Antenna Design is an important resource for antenna/microwave engineers, aerospace systems engineers, and advanced graduate and postdoctoral students wanting to learn how to design and fabricate their own antennas to address clear mission requirements.

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