

SPECIAL ISSUE ON

Recent Advances on Satellite Antennas for Communication, Navigation, and Scientific Mission Payloads

Over the past two decades, there have been significant developments in the area of antenna systems for advanced satellite payloads with several applications in communications, navigation, military, and science missions. These include high-capacity satellites, direct-to-home satellites, small satellites, global positioning satellites, and deep-space exploration. The antenna systems also evolved from a simple low gain omnidirectional antennas and global coverage horns to high gain reflector antennas and phased arrays. Contoured beams using shaped reflectors have played a key role in several communication satellites at C, Ku, and Ka bands. Multiple beam technology is used where several spot beams that reuse the frequencies cover a designated area on ground. Mobile satellites, global position satellites, and high-capacity satellites employ this technology to increase the capacity to several terra bits per second. Direct-to-home (DTH) satellites extended national channel coverage to include local channels by using multiple nonuniform beams. Multiple reflector technology and phased array technologies are considered for these applications. Communication satellites also require high-power handling, low passive-intermodulation (PIM), and low front-end losses. Feed technologies suitable for these applications are also being developed at various communication bands. Other developments include large deployable mesh reflectors, high-efficiency feeds, phased arrays with digital beam-forming technology, reconfigurable antennas, reflect-arrays, and low scan loss reflector antenna systems. Antennas for small-satellites are challenging due to the need for compact size, low cost, and low mass. Antennas for scientific mission satellites have other constraints such as severe thermal environment, long mission life, high reliability, and high performance. Each mission is different and, hence, the antenna designs are also unique and different from each other. Science missions require state-of-the-art technology to achieve ambitious goals in terms of high resolution, high sensitivity, and high frequency of operation. Although technology is advancing at a rapid pace, requirements for these instruments go well beyond those that are currently available. This necessitates the need for new antenna configurations and payload technologies.

This special issue is intended to address the latest developments and advancements in satellite antennas for communication, navigation, military, and scientific payloads. Authors are invited to submit papers covering the aforementioned topics involving antenna design, hardware development, integration, test,

advanced feed technology, high power handling, PIM, antenna interactions/scattering with spacecraft body, and thermal designs. Manuscripts should conform to the requirements for regular feature articles as specified in the information for authors of *IEEE Antennas and Propagation Magazine (APM)*. Interested contributors are encouraged to contact any of the guest editors to determine suitability of their topic. All papers must be submitted online through the *APM* manuscript submission website (<https://mc.manuscriptcentral.com/apm-ieee>). Please select "Original Article—Satellite Antennas Special Issue" manuscript type when submitting..



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