

Space and satellite technology

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Over the last decades Space and satellite technology has increasingly become part of our daily lives, be it regular weather forecasts based on satellite images, the multitude of TV channels distributed via satellites or the navigational GPS support we find in almost every car—not to mention the many other services and science missions that are based on modern satellite technologies. Austria has a long tradition especially in the area of Space research and technology.

The first Austrian Space object, a measurement probe for ionospheric research, was launched on 26 November 1969 on board of a Norwegian sounding rocket. In 1981 Austria became an associate member of the European Space Agency ESA and has been a full member since 1987. Austria contributes to the mandatory and optional

ESA programs. The annual Space expenditures amount to 65 million Euro (including the national Space program ASAP and the contribution to EUMETSAT). Regarding the optional programs Austria focuses on its strengths, both in industry and academia. Earth observation, satellite communications and satellite navigation as well as integrated Space applications constitute the majority of the projects contracted to Austrian companies, universities and research organizations. In the area of satellite communications Austria has significantly contributed to ESA missions such as OTS, OLYMPUS, ARTEMIS and most recently ALPHASAT. In 2013 Austria became a “launching state” with the successful orbiting of the first Austrian satellite BRITE-Austria/TUGSAT-1 and its companion UniBRITE.

In this special edition of the e&i journal particular aspects of satellite technology and applications are addressed.

The first paper by Manfred Wittig discusses the past, presence and future of intelligent communications payloads, “switchboards in the sky”, which improve communications and service efficiency.

The second paper by Michael Schmidt et al. presents the design of a satellite ground station for Q/V-Band (40/50 GHz) and the communications and propagation experiments which are conducted using ESA’s largest telecom satellite, ALPHASAT.

The paper by Qi Luo focuses on intelligent antenna technology for mobile satellite communications which can increase the channel capacity, spectral efficiency and coverage.

Norbert Frischauf’s paper addresses aeronautical applications of satellite navigation systems such as GPS, GALILEO and others which aim at improving air transport safety.

The paper by Otto Koudelka presents two examples of demanding nanosatellite missions, namely BRITE, a small satellite constellation for asteroseismology, and OPS-SAT, an ESA project to demonstrate in orbit novel technology and new operational concepts.

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