

**THE HYPERSONIC DRAG BALLOON PROJECT ARCHIMEDES – A NOVEL  
ATMOSPHERIC SOUNDING PROBE FOR MARS**

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ARCHIMEDES is an effort to probe the atmosphere of planet Mars by means of a hypersonic drag balloon, a device known as a “ballute”. The project is currently under study, proposed and supported by the Mars Society Germany, the Universität der Bundeswehr München, the AMSAT-DL .e.V. organization, the DLR, and several other research institutions and industrial companies. The probe is planned to be integrated into the AMSAT’s P5-A Mars satellite, and to be released from the spacecraft when in orbit around the planet. Launch of the P5-A is currently planned as a piggyback payload on an Ariane V rocket, as it is standard practice for spacecraft of the German AMSAT section.

## **1. ARCHIMEDES MISSION**

The scientific scope of project ARCHIMEDES involves in situ measurements in the Martian atmosphere, magnetic environment and surface throughout almost the entire altitude range reaching from outer space to ground. [11]

Another important goal of the project is to demonstrate and qualify the ballute technology for entry into planetary atmospheres at high velocities on a representative mission [8], [15]. The term “ballute”, combining the words “balloon” and “parachute”, was coined by the Goodyear Aerospace Corporation when the company pioneered the technology for NASA back in the 1960s. Although an actual flight test was never performed, data gained during their extensive research program [14] can still be used today in the design phase of ARCHIMEDES.