



## **CubeSats aided Wireless Sensor Networks for exploration of Mars and Venus**

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Mars has been found to be the most prospective solar system exploration target because of plausible existence of extinct/extant life. After Mars, Venus exploration has been gaining momentum in recent times due to its physical similarities and contrast environment with respect to Earth. Detailed exploration of these two planetary objects can provide several fold increase in our understanding about the terrestrial planets and their evolution. For this purpose, long-term in situ measurements at geographically distinct locations are necessary. The biggest hurdle in this endeavor is the difficult targets and/or harsh environments that are encountered both during deployment and surface operations. Landers/Rovers experience difficulty in reaching inaccessible but scientifically favourable terrains on Mars, while on Venus, deploying a Lander/Rover itself is a big challenge due to its harsh environment, and Long-term spatio-temporal investigations are not at all feasible by Lander / Rover missions.

To address these aspects, Cubesats aided Multi-tier Wireless Sensor Networks (WSN) are proposed and being developed as prospective tools for scouting Mars and Venus. Several scientific aspects of Mars and Venus can be addressed by these devices during their short survival. Nodes with varied capabilities are planned to be deployed through piggy back cube-sats that form an adhoc and self-healing network. A prototype of WSN using CoTS has been designed and its feasibility of survival and operation under extreme conditions is studied by means of few short term tests. Preliminary results are encouraging and show that these devices can survive and operate under extreme planetary environments. Details about their design, development, testing and possible mission architectures will be discussed.