

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
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THE ITALIAN SPACE AGENCY DAMA MISSION RESEARCH PLAN. IMPLEMENTATION,  
EXECUTION AND OUTCOMES OF THE EXPERIMENTS.

**Abstract**

On the basis of the agreements reached in 1991 and confirmed in 1997, ASI (Italian Space Agency) has developed and supplied to NASA three MPLM flight units. In return, among other utilization rights, ASI got the right for six flight opportunities for Italian Astronauts, including both three STS missions and three long duration ISS missions.

As well, ASI and the Italian Air Force ITAF signed an Executive Agreement (July 2008) with the aim to co-operate in the definition and the implementation of a common Human Space Flight program.

Within the above frame, the DAMA (Dark Matter) mission in 2011 was a major milestone. The Italian ESA astronaut Roberto Vittori, colonel of the ITAF, already cosmonaut, was part of the STS-134 crew with the role of Mission Specialist and a composite team coordinated by the Italian Space Agency, and including Air Force members, industrial support services from ALTEC and Telespazio, payload developers and science teams, carried the definition, design and implementation of the mission, including a major complement of scientific and technological.

The on-orbit operations of the DAMA mission was conducted and completed in the spring of 2011. All the research tasks for the twelve experiments planned, including pre- and post-flight operations, have been completed successfully and the six ASI payloads returned to ground.

The aim of the paper is to present an overview of proposal selection and approval, implementation and execution of the DAMA Mission experiments and a summary of the research objectives and main outcomes, as communicated by the science teams. As well, an overview of the mission integration process, the payloads certification, the on-ground processing and the on-orbit execution will be provided.