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# LUNAR NET —A PROPOSAL IN RESPONSE TO AN ESA M3 CALL IN 2010 FOR A MEDIUM SIZED MISSION.

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**Abstract:** Emplacement of four or more kinetic penetrators geographically distributed over the lunar surface can enable a broad range of scientific exploration objectives of high priority and provide significant synergy with planned orbital missions.

Whilst past landed missions achieved a great deal, they have not included a far-side lander, or investigation of the lunar interior apart from a very small area on the near side. Though the LCROSS mission detected water from a permanently shadowed polar crater, there remains in-situ confirmation, knowledge of concentration levels, and detailed identification of potential organic chemistry of astrobiology interest. The planned investigations will also address issues relating to the origin and evolution of the Earth-Moon system and other Solar System planetary bodies.

Manned missions would be enhanced with use of water as a potential in-situ resource; knowledge of potential risks from damaging surface moonquakes, and exploitation of lunar regolith for radiation shielding.

LunarNet is an evolution of the 2007 LunarEX proposal to ESA (European Space Agency) which draws on recent significant advances in mission definition and feasibility. In particular, the successful Pendine full-scale impact trials have proved impact survivability for many of the key technology items, and a penetrator system study has greatly improved the definition of descent systems, detailed penetrator designs, and required resources.

LunarNet is hereby proposed as an exciting stand-alone mission, though is also well suited in whole or in-part to contribute to the jigsaw of upcoming lunar missions, including that of a significant element to the ILN (International Lunar Network).