

Near space biological research using weather balloons

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Introduction:

On the 11th of January 2015 myself (Samuel Mark Harrison) a Bournemouth University Student and Daniel Parker both from the UK launched our Shackleton 2 near Space Probe (pictured). This was part of project to test ultra low-cost near-space vehicles that can be used to carry out near-space research. Our probe travelled over 300 miles (flight path pictured) and endured the hostile environment of near space. It experienced temperatures as low as -50 degrees Celsius, a near vacuum at its peak altitude of 89,000ft and speeds of over 150mph. Our probe was carried to this altitude using a 2000g PAWAN Indian weather balloon filled with helium.

By using these near space probes research can be carried out into planetary protection by launching biological samples into the extreme conditions that space offers. This allows us to see which types of sample biological contamination thrive even in near space. This represents a small but vital step to ensuring we don't contaminate future planets particularly in the context of manned missions when the risk of biological contamination is far greater. Due to the levels of altitude which weather balloons can operate at (up to 130,000ft) research can also be carried out into the effects of cosmic radiation on cells. This would be of great relevance both in the context of contamination but also on the ability for humans to survive outside of earth's environment.

Basic probes complete with tracking system can be launched and recovered for a fraction of the cost of other alternatives which allows this area of research to be far more accessible for students on a global level. Given the rise of nations such as India and China and their respective space programs this technology is a fantastic low-cost tool for building the skills of future bright minds around the world for the manned missions of the future.

