

Abstract Submitted
for the NMC16 Meeting of
The American Physical Society

A New Approach on Sampling Microorganisms from the Lower Stratosphere¹ KIANA GARCIA DARLINGTON, BRYAN GUNAWAN, JAMIE LEHNEN, JOHN PRINCE, CIARA LALATA, Univ of Houston — The Undergraduate Student Instrumentation Project (USIP) research group at the University of Houston will attempt to provide a cross-sectional analysis of microorganisms in the lower stratosphere by collecting samples using a lightweight, balloon-borne payload. Previous active and passive collection attempts have been made using low-pressure pumps and varying filtration mechanisms to physically capture the organisms. However, the results of these experiments were usually invalidated because of inadequate sterilization and subsequent contamination of the samples. Our research group will circumnavigate these issues by constructing an efficient suctioning device for sample intake and by using a polyphasic sterilization approach to ensure the validity of the samples. Thermal, pressure, and altitude sensors, powered and controlled by an Arduino microprocessor, are included in the design for data storage and for redundancy measure in case of instrumentation failure. Our expectation of the experiment is to recover at least seven microorganisms per cubic meter of air, which will then be analyzed for their radiation resistance and other traits that enable survival in a low-pressure and low temperature environment.

¹N.A.S.A.

Kiana Garcia Darlington
Univ of Houston

Date submitted: 06 Sep 2016

Electronic form version 1.4