

# Summary of the Research Proposal for the Intensity Frontiers Fellowship

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May 20, 2016

Precision measurement of the anomalous magnetic moment of the muon,  $a_\mu = (g - 2)/2$ , is the goal of the New  $g - 2$  experiment (E989) at Fermilab. The measurement is a fundamental test of the Standard Model (SM) of particle physics and can probe for evidence of new physics. The latest measurement of  $a_\mu$ , performed at Brookhaven National Laboratory in 2001, differs from the SM prediction by more than 3 standard deviations ( $\sigma$ ) indicating the possibility of new physics. The new measurement of  $a_\mu$  is expected to achieve a precision which should be sufficient to confirm or reject the new physics evidence with more than  $5\sigma$ .

I would like to employ an Intensity Frontier Fellowship to work on the assembly and commissioning of the laser calibration system for the E989 electromagnetic calorimeter. The performance of this system plays a crucial role in archiving the desired experiment precision. The Fellowship will also support activities related to development of the software for the analysis of the data, in which is essential to incorporate the information obtained from the laser calibration system.