**PROJECT SUMMARY**

**NAME OF INSTITUTION (INCLUDE BRANCH/CAMPUS AND SCHOOL OR DIVISION)**

Louisiana State University, Baton Rouge

**ADDRESS (INCLUDE DEPARTMENT)**

Agronomy & Environmental Management Department  
104 Sturgis Hall  
Baton Rouge, LA 70803

**PRINCIPAL INVESTIGATOR(S)**

Maud M. Walsh

**TITLE OF PROJECT**

Reassessment of microbial signatures in 3.4 billion-year-old Earth rocks and their implications for astrobiology

**ABSTRACT (DO NOT EXCEED 250 WORDS)**

The detection of microbial signatures is important in both the study of early life on Earth and in the search for evidence of life elsewhere in the universe. Recent controversies over the nature of preserved organic matter and microfossils in some of the oldest sedimentary rocks on Earth have lead scientists to scrutinize more closely early reports of microbial fossils. The proposed research will re-examine 3.4-billion-year-old rocks that were reported to contain evidence of microbial activity and associated sedimentary and volcanic rocks. Newly-developed techniques in transmission electron microscopy will be used to examine fine-scale textures and spatial relationships in carbonaceous cherts in an attempt to discriminate between microbially-constructed features and abiogenic structures and to develop recommendations for detecting microbial structures in extraterrestrial environments.

The proposed research will be conducted at Louisiana State University and Portland State University (during a sabbatical visit), with one collaborative visit to NASA Ames Research Center. Undergraduate students at both Louisiana State University and Portland State University will be involved in the research effort. The research will be incorporated into ongoing education and outreach activities, including professional development programs for K-12 science teachers and undergraduate and graduate courses in earth and environmental science.