

DEPARTMENT OF MECHANICAL AND MATERIALS ENGINEERING  
COLLEGE OF ENGINEERING AND APPLIED SCIENCES

FOR APPLICATION YEAR: 2021

PROJECT TITLE: Electrical Machining of Insulators

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**Project Description**

Electrical machining of insulators may seem like an oxymoron to many, but not for the researchers in the UC Micro and Nano Manufacturing Laboratory (<https://ceas.uc.edu/research/centers-labs/micro-and-nano-manufacturing-laboratory.html>). Electrochemical discharge machining (ECDM) is a non-conventional machining process that utilizes an electric current to machine non-conductive material by this method. In this project, the student will use an existing pulse ECDM setup to investigate the machining of different non-conductive material (e.g., borosilicate glass, silicon nitride ceramics).

Learning opportunities for students:

As this research is multidisciplinary in nature, it offers a tremendous opportunity for undergraduate students to be exposed to interdisciplinary research. The project will also introduce students to various academic research starting from literature review to report preparation. The experimentation involved will offer hands-on experience in research for the students. Students will learn about the theory behind the ECDM process and understand the working of the pulse ECDM. The students will also be encouraged to present the work at either a conference and/or prepare a paper for journal publication.