

Honors Research Project Proposal

Please Print

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Title of Proposed Project: Strengthening Metallic Components Using Laser-Assisted Ultrasonic Nanocrystal Surface Modification	
Major: Mechanical Engineering	Graduation (semester/year): spring/2021

Please include a brief (maximum 200 words) summary of your proposed project

Metal mechanical components are a vital part of industry. Consequently, there is a great need for optimizing the mechanical strength and fatigue performance of these components. A new process for achieving this is Laser Assisted Ultrasonic Nanocrystal Surface Modification (LA-UNSM). There are many prospective applications in various fields, such as aerospace and construction, for increasing the strength and fatigue performance of metal. For example, the lifespan of a turbine blade can be greatly increased by improving fatigue performance. Based on the demand of mechanical properties from industrial applications, this project aims to select a metallic candidate for LA-UNSM. After material selection, the goal of the project is to improve its mechanical strength and fatigue performance. Understanding and relating processing, microstructure, and performance of the material after LA-UNSM treatment is the final goal for this project.

Approval:

Honors Course No.: 4600:497	No. of Project Credits: 4						
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Your approved cover sheet and proposal must be [submitted to the Williams Honors College through IdeaExchange](#)