

AIAD #10965

Research Opportunity (Faculty, Cadet, both): Cadet

ORGANIZATION/PROJECT SPONSOR

Organization: Army Research Laboratory

Organization POC: John La Scala

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Location of Sponsoring Directorate or Division (City, State): Aberdeen Proving Ground, MD

PROJECT

Title: (Place Title Here)

Environmentally Friendly Composite Resins

Description: The DoD uses composites for various applications and on many weapons platforms to reduce weight and improve performance. Resins used in the preparation of polymer matrix composites, such as epoxies and vinyl esters, are derived from petroleum resources and their cost/supply is volatile. Furthermore, these materials produce toxic emissions and hazardous waste. We are developing composite resins from renewable resources, such as cellulose, plant oils, and chitin, as environmentally friendly alternatives. To do so, the cadet will chemically modify renewable resources to produce monomers. Then, the cadet will prepare polymer samples, and evaluate the physical properties, such as modulus and glass transition temperature.

ARL/Army Benefit: Increased use of composites will reduce the Army's fuel usage and create faster and lighter vehicles. Composites based on renewable resources allow for a more stable cost of composite materials as well as reducing dependency on foreign nations for petroleum.

Background Required: Knowledge of polymeric materials. Knowledge of mechanics or mechanical testing of materials, Knowledge of chemistry.

Security clearance required: What level of clearance is required (None, Secret, or Top Secret)? None

Capacity: (maximum number of faculty/cadets you would like working on this project) 2

Duration: 4 weeks or longer are preferred, but not required

Block Preference: Please specify what timeframes DO NOT WORK for the

organization (23 May – 8 August): all time frames are open