Pacific Northwest
NATIONAL LABORATORY

10:00 a.m.
Thursday, August 4
Virtual Seminar

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MAaD Science
Materials Aging and Detection Science
@PNNL

Aniruddh Vashisth, Assistant Professor
University of Washington, Seattle

RADIO FREQUENCY HEATING OF HEALABLE POLYMERIC COMPOSITES

Fiber-enforced plastics (FRPs) are replacing their metal counterparts in a wide variety of structural applications. FRPs are projected to represent a $31 billion market by 2024, driven by soaring demand in the automotive, aerospace, and sports equipment industries and in circuit boards. However, due to limitations such as their brittle failure, insufficient fatigue life, and poor recyclability, deficiencies result in performance, cost, safety, and reliability of structural components.

Vashisth discusses how his research led to the discovery that these deficiencies can be alleviated through creating a dynamic system by heating the material above its topology freezing transition temperature. Through this reorganization of material structure, fatigue failures in vitrimers and carbon-fiber reinforced vitrimers (vCFRPs) can be postponed indefinitely. Such vCFRPs could open the door to future materials in which natural aging and fatigue processes can be periodically reversed to guarantee safe and reliable long-term operation of composites for various applications.

The Materials Aging and Detection (MAaD) Science Seminar Series at Pacific Northwest National Laboratory presents Assistant Professor Aniruddh Vashisth at 10 a.m. PDT on Thursday, August 4, via Teams. The seminar is free and open to the public. An assistant professor in mechanical engineering from the University of Washington, Vashisth is a graduate of Pennsylvania State University with a PhD in engineering sciences and mechanics engineering. His research couples experiments and atomistic simulations to examine the mechanics of materials with four primary areas of thrust: sustainable polymers, rapid heating using electromagnetic fields, polymer physics, and atomistic simulations.

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