Abstract Submitted
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Ongoing Research in the Radiation Surface Science and Engineering Laboratory at Penn State University MATTHEW PARSONS, TERESA ADITYA, CAMILO JARAMILLO, ANDREA RESTREPO, HANNA SCHAMIS, MERAL SHARKASS, Pennsylvania State University, MUHAMMAD ABDELGHANY, MICHAEL LIVELY, University of Illinois at Urbana-Champaign, JEAN PAUL ALLAIN, Pennsylvania State University, and University of Illinois at Urbana-Champaign — The Radiation Surface Science and Engineering Lab (RSSEL) has recently set up shop at Penn State University and is actively engaged in using irradiation synthesis to design surfaces and interfaces in materials from the mesoscale to the nanoscale. Our work is primarily focused on the development of materials for nuclear fusion and biomedical applications. The biomaterials group focuses on the use of plasma irradiation to modify the cell adhesion of surfaces for tissue engineering and biomedical implants. This includes the plasma irradiation of materials ranging from titanium to chitosan, bacterial cellulose, and polyetheretherketone polymers. Ongoing fusion materials projects include the development of in-situ surface characterization tools, development of plasma-facing components for fusion reactors, and modeling of impurity transport at the boundary of tokamaks. These activities are highly collaborative with both domestic and international fusion research programs. Additional computational activities in our group, supported through Penn States Institute for Computational and Data Sciences, include multi-scale atomistic simulations of surface nanopatterning, surface morphology, and surface chemistry of materials including high-entropy alloys and fusion-based tungsten alloys.

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