SES13-2013-000084

Abstract for an Invited Paper
for the SES13 Meeting of
the American Physical Society

Bio-Inspired Sticky and Slippery Materials

NOSHIR PESIKA, Chemical and Biomolecular Engineering Department, Tulane University

Through evolution nature has come up with solutions or alternatives to overcome challenges encountered by living organisms. This has led to the field of biomimetics, in which scientists are continually developing new technologies or improving current technologies by learning from nature. In this talk, I will present our recent work in developing a gecko-inspired adhesive and demonstrate how the judicious design of the surface microstructure gives rise to unique properties reminiscent of the natural gecko adhesive system; i.e., when the adhesive is sheared in one direction, it offers high adhesion and friction forces, but when sheared in the opposite direction, the adhesion and friction forces generated are lower. As another example, I will also discuss how surface texturing of a compliant polymer film, inspired by cartilage, can lower friction forces and potentially reduce surface wear.