Abstract Submitted
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Transformative Skin: From Anti-biofouling to Reliable Power Cable[1] XUANHE ZHAO, Soft Active Materials Laboratory, Duke University — This talk will discuss the fundamental physics and potential applications of transformative skin, an electroactive polymer system recently developed at Duke Soft Active Materials Laboratory (SAMs Lab). The working mechanism of the transformative skin is based on the creasing-to-cratering instability in polymers under electrical voltages. The instability can induce failures in power cables and polymer capacitors. By suppressing the instability, one can greatly enhance the reliability and energy density of the cables and capacitors. Surprisingly, the same instability can generate a rich variety of on-demand patterns on polymer surfaces in response to voltages. The feature size of the pattern can be tuned from millimeter to nanometer. The pattern formation and surface deformation can dynamically debond biofilms formed on polymer surfaces, giving extraordinary capability of active antibiofouling.

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