

# **Keynote: Transport-phenomena-based Approaches to Surface Engineering**

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Surface engineering can include many approaches, from fabrication to control offered by transport phenomena mediated by the surface properties. In this talk I give several examples of our work focused on the latter. In particular, I describe (1) fluid dynamics aspects of liquid-infused surfaces, in particular design strategies to limit shear-driven drainage of trapped lubricant, (2) surface control of quorum sensing of surface-attached bacteria, (3) peeling of films from a substrate where surface tension of an interface is utilized, hence the term “capillary peeling”, which we also apply to remove biofilms from surfaces, and finally (4) using ion gradients created by diffusing CO<sub>2</sub> through a substrate to move particles closer or farther from a surface, which takes advantage of a physicochemical process referred to as diffusiophoresis. These transport-mediated processes illustrate some aspects of an active sub-field in surface engineering.