

Revealing adhesion interface phenomena through in situ approaches

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In my talk I will include and highlight examples of how in situ approaches enrich our understanding of small and large contacts in the context of marine bioadhesion, and in particular barnacles. Marine bioadhesion is accomplished across species with a surprisingly wide variety of materials compositions and mechanical properties. Barnacles adhere by developing a composite, layered interface through repetitive growth and expansion tied to molting cycles. They use crack arresting geometries and hierarchical meso- and nano-architectures to manipulate fracture properties, and use chemistry to actively disrupt organisms under and around them and facilitate adhesion. I will show how these insights allow us to develop new approaches to designing both antifouling materials and underwater adhesives.