MPI of COLLOIDS & INTERFACES

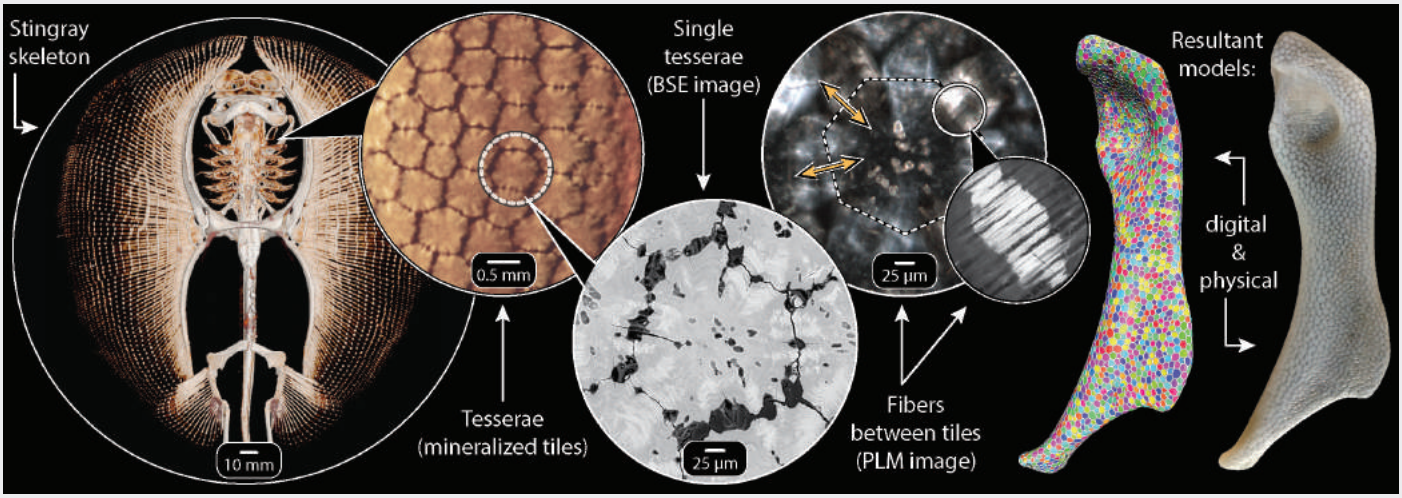
1-2 Master-student positions - starting late 2019

Structure/function relationships in materials: Lessons from shark and ray skeletons

MPG

PI: Mason Dean, Dept. Biomaterials, Max Planck Institute for Colloids & Interfaces, Potsdam, Germany; ***www.masondeanlab.com***

The system: Unlike most vertebrates, sharks have skeletons made of cartilage not bone. In contrast to human cartilage, however, a shark's skeleton is "tessellated": skeletal elements made of uncalcified cartilage are wrapped in an outer layer of thousands of mineralized tiles called tesserae. Although this has defined the shark and ray lineage for hundreds of millions of years, it is still unclear what role this tiling plays in mechanics and growth of this ancient, composite skeletal material.



The projects: Our work uses biological, materials + design techniques to characterize shark/ray cartilage, to understand the role of tesserae in tissue mechanics and the potential of sharks/rays as models for skeletal biology. We are interested in pursuing several projects, involving application of materials characterization techniques—e.g. microCT, SEM, material testing, 3D printing—to the analysis of shark/ray muscle and skeletal biology.

About you: You are studying materials science, anatomy or biomechanics and have strong experimental and visual skills. Familiarity with 3D visualization/rendering is a plus. You are dynamic, curious and open to interdisciplinary interactions, and you enjoy research. Motivation, autonomy, team spirit and proactive communication (mainly in English) will be main motors for a successful project.

About us: We are a young research group in comparative skeletal biology, mixing perspectives from zoology, engineering, marine science and biomaterials. Our group is embedded in the Department of Biomaterials, providing the opportunity to benefit from the experience and equipment of a diverse and innovative department.

Contact: Submit your application to mason.dean@mpikg.mpg.de with CV + transcripts