

Mechanics of Biological Exoskeletons: New Design Paradigms from Nature

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*Photo of *P. senegalus* by S. Reichert and J. Song*

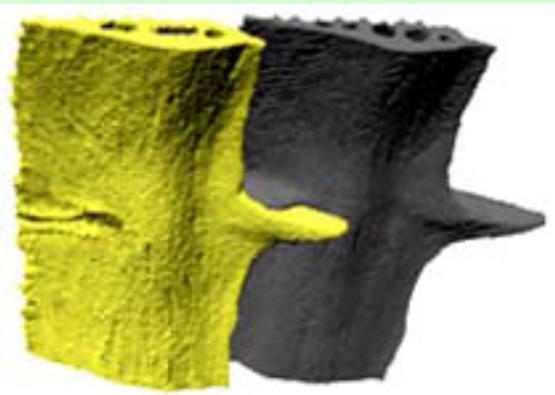
Unique capabilities of full-field x-ray imaging at synchrotron facilities

High-speed 2D phase-contrast imaging with micron resolution

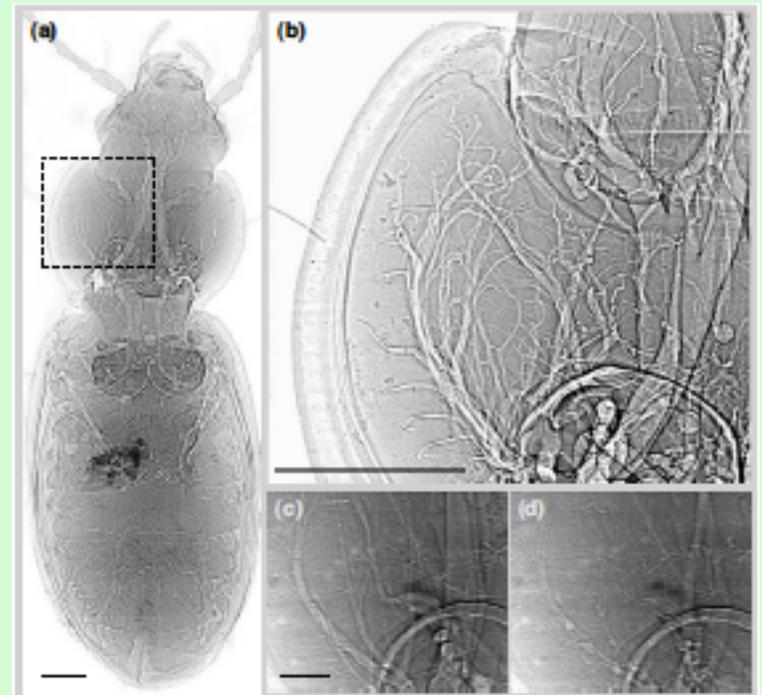
- Allows interrogation of dynamics within living organisms, esp. insects

3D micro-computed tomography (μ CT)

- Provides 3D structural detail that enables morphometric analysis, finite element simulation, and 3D micro- and macro-fabrication



Stickleback (J. Song+ 2010)



Beetle (J. Socha+ 2007)

However, restrictions on sample size with current beamlines prevent the investigation of many species

- The proposed full-field imaging beamline will allow greater experimental freedom