

Biomaterials at the Interface  
between Technology and  
Life Sciences  
Silklab

## BIOMATERIALS AT THE INTERFACE BETWEEN TECHNOLOGY AND LIFE SCIENCES

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**Categories:** [Designing Matter](#), [Energy and sustainability](#), [Essay](#), [expanding design practices](#), [Fiorenzo Omenetto](#), [Giusy Matzeu](#), [Laia Mogas Soldevila](#), [No Density](#), [Silklab](#), [Technology and fabrication](#), [Urban Paradigms](#)

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The Silklab invents, designs, and manufactures living materials and products for the future. Innovate is based on advanced material processing and the manufacture of sustainable carbon-neutral technologies to imagine a new class of applications for living materials that operate seamlessly at the interface between the biological and the technological worlds.

Structural proteins are nature's building blocks, conferring stiffness, structure, and function to ordinarily soft biological materials. Such proteins are polymorphic, which allows for control of the end material format through their natural self-assembly. The resulting biomaterials and composites can be simultaneously "technological" (e.g., mechanically robust, micro- and nanostructured, high-performing) and "biological" (e.g., living, adaptable, bio-functional, bio-sensing) making them ideally suited for applications at the interface between these two domains.

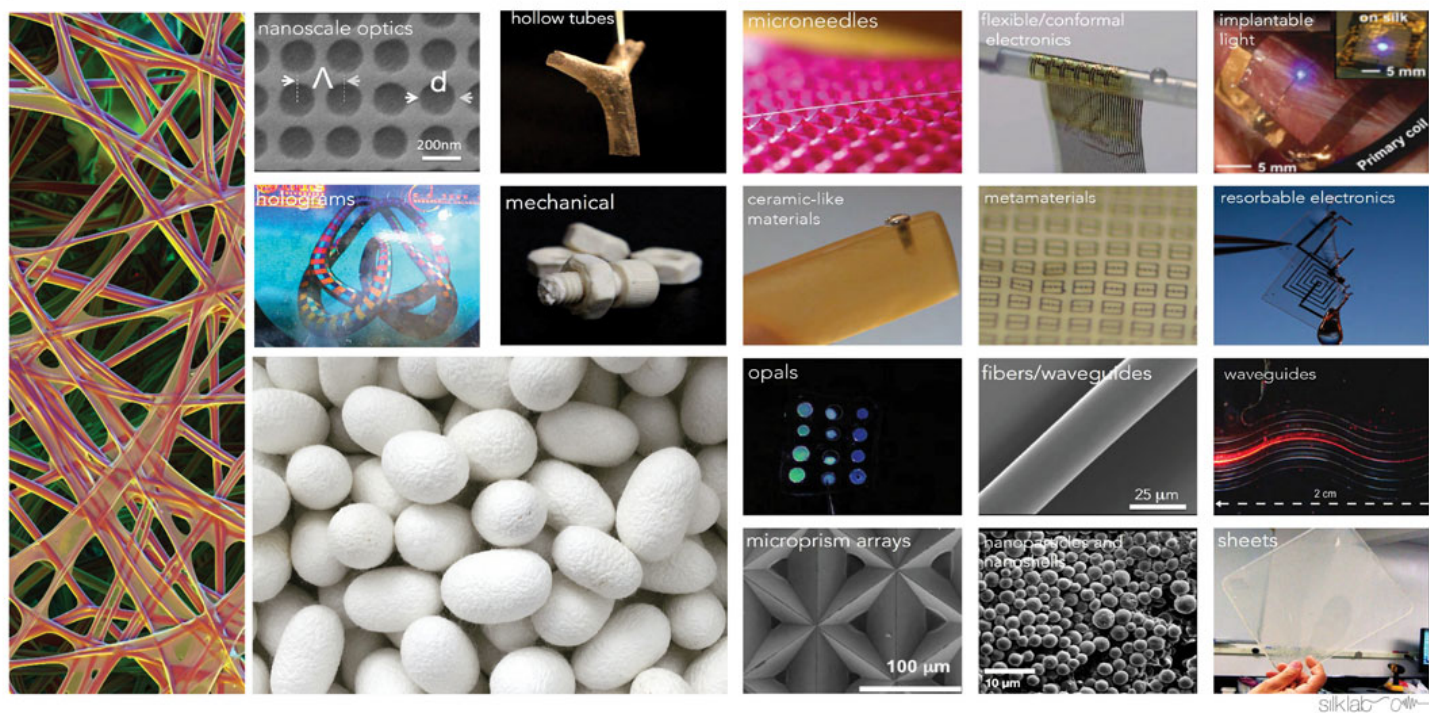
Specifically, computational design and hybrid fabrication methods (e.g., 2.5D printing, inkjet printing, screen-printing and specialized molding) provide a great opportunity to structure and transform silk-based biomaterial blends into personal objects and architectures with unexpected functions and an element of surprise. The Silklab is currently developing objects that are digitally derived and biologically sensitive – able to communicate with their surroundings by tracking and displaying human health, athletic performance, changes in mood and stress, or environmental pollution levels.

The softness, elegance, emotion, and polymorphic properties of silk and silk protein allow for the conception of a wide range of product and architectural design applications with high levels of both functional performance and surprising aesthetics.

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## Silk Polymorphism at the intersection of Technology and Biology

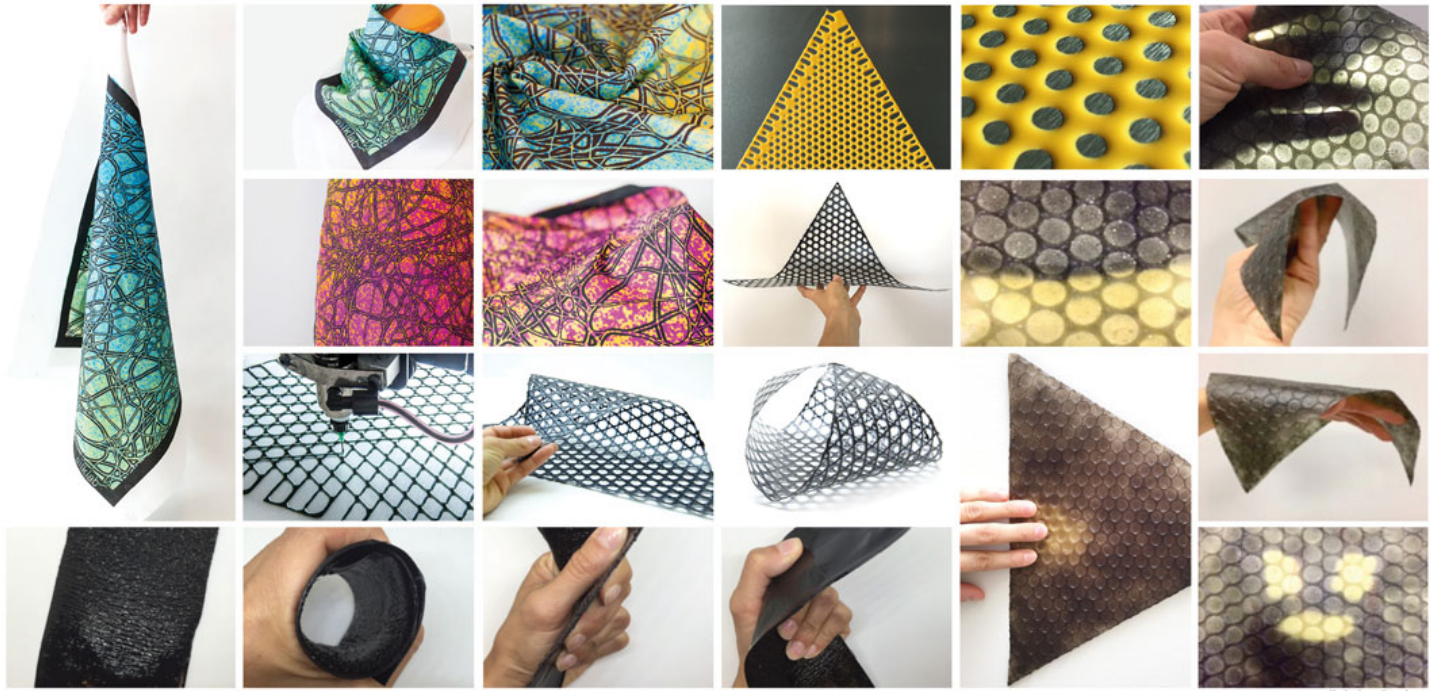


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## Silk-based Technological Designs with Unexpected Properties and Surprise



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