

Company

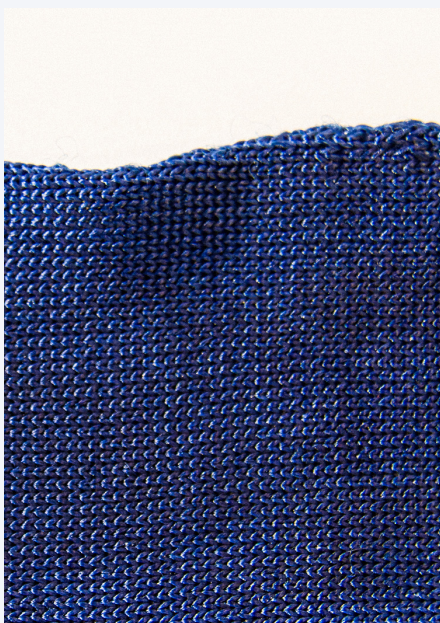
Sci-Lume Labs is a materials science company. We develop new biobased and degradable polymers to replace conventional petrochemical materials like nylon and polyester. We are dedicated to harnessing the economic and manufacturing efficiencies of the built plastics infrastructure, enabling cross-industry transformation for positive environmental and social impact at scale.

The problem we address

The accumulation of fiber waste has profound environmental and social effects, including GHG emissions by material production, energy and transport; consumption of critical resources like water and arable land; and chemical pollution by pesticides, fertilizers, and other industrial contaminants. Industries must adopt circular materials and efficient means to manufacture them in order to achieve positive environmental and social impact. However, no material has been able to deliver the combined circularity, scalability, performance, and cost to be commercially viable.

Our solution

Sci-Lume Labs makes Bylon®, a scalable, circular, biosynthetic fiber. Using highly efficient chemistries to valorize biogenic carbon, Bylon seamlessly integrates into every step of the global value chain—from raw material production through textile manufacturing. Bylon is distinct from incumbent and next-gen materials because it is simultaneously biobased; waste-derived; degradable; recyclable; downstream-compatible; and melt-spinnable. Bylon also offers a unique performance profile by combining the mechanical properties and tunability of traditional synthetics with the moisture properties and circularity of natural fibers. By not requiring changes to the supply chain, Bylon empowers the industry to reduce its environmental impact—without compromising on quality, performance, or cost.



FOUNDATION

- 2021

TURNOVER

- < \$1 million USD

EMPLOYEES

- 1-5

KEY TOPICS

- Innovative materials
- Polyamides
- Biobased
- Thermoplastic
- Degradable
- Drop-in compatible

KEY SERVICES

- Fibers
- Yarns
- Pellets
- Polymer development

MORE INFORMATION

<https://sci-lumelabs.com>

Bylon

A biosynthetic polyamide derived from low-cost biogenic feedstocks, without compromising on quality, performance, scale, or cost.

Melt-processable

Bylon is melt-processed and drops into the same melt-spinning infrastructure currently used to make the majority of mainstream synthetics. Melt spinning is the only method for manufacturing synthetic fibers at the scales required to meet current global demand.

Biobased

Bylon is made from Gen-1 or Gen-2 biogenic carbon via a three-step chemical process. Novel chemistry valorizes the feedstock into Bylon's monomer at mild temperatures—a reaction with 100% conversion and >90% monomer yield. Finally, ring-opening polymerization creates the Bylon polymer. Each step is decoupled, allowing independent optimization and scaling.

Responsible end-of-life

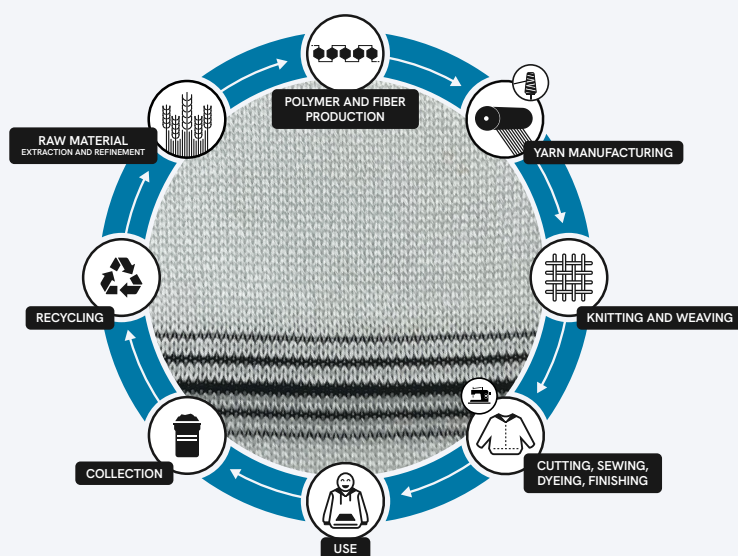
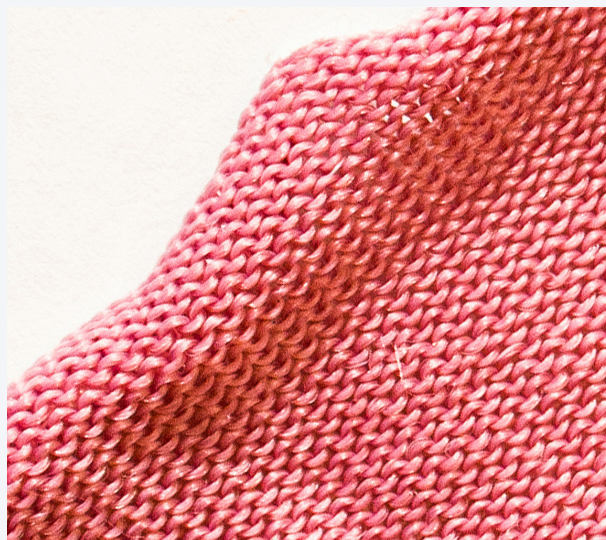
Bylon is recyclable and degradable at end-of-life, resulting in a material designed to reduce persistent environmental waste. Bylon can be recycled under mild conditions—less than 200°C—in mono- and mixed materials, resulting in virgin-grade recycled Bylon with minimal damage to the other material. Bylon has also shown degradability in home soil tests.

Performance versatility

Bylon offers a unique performance profile, combining the moisture properties and circularity of natural fibers with the mechanical properties and tunability of synthetics. Bylon yarn absorbs dyes easily, and can be knit and woven—making it suitable for replacing legacy synthetics in monomaterials and blends.

Scalable + low cost

Bylon seamlessly integrates into the built petrochemical materials infrastructure used to make conventional plastics. Leveraging current infrastructure and manufacturing methods enables Bylon to easily integrate into existing supply chains, and rapidly scale without increasing costs or investing in new technologies.



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