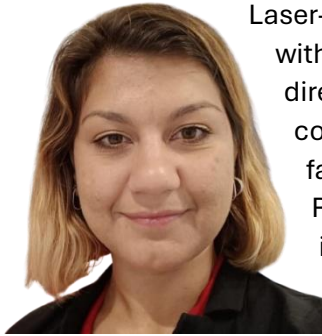


Laser-Induced Graphene from Synthetic and Bioderived Precursors for Soft Electronics and Robotics

Dr. Anna Chiara Bressi

Post-Doctoral Researcher at the Laboratory of Applied Materials for Printed and Soft Electronics at the Scuola Superiore Sant'Anna, in Pisa, Italy



Laser-Induced Graphene (LIG) is a three-dimensional, porous material with high surface area and good electrical conductivity, produced via direct laser irradiation of synthetic and bioderived polymers. Unlike conventional graphene synthesis, LIG offers a one-step, open-air fabrication process that is rapid, scalable, and chemical-free. Recently, attention has shifted toward bioderived precursors to improve sustainability while maintaining functional performance. This seminar synthesizes findings from multiple studies of the LAMPSe group, investigating structure-property relationships of LIG from various precursors and their applications in soft robotics, flexible electronics, and environmental remediation. A cradle-to-gate life cycle assessment is also presented, highlighting the environmental advantages of bioderived versus synthetic LIG. Overall, these results demonstrate that carefully selected precursors enable high-performance LIG with reduced environmental impact, advancing sustainable, application-driven graphene technologies.

From synthetic to bioderived LIG

