Soft Actuators based on Liquid Crystal Elastomer and Laser-Induced Graphene

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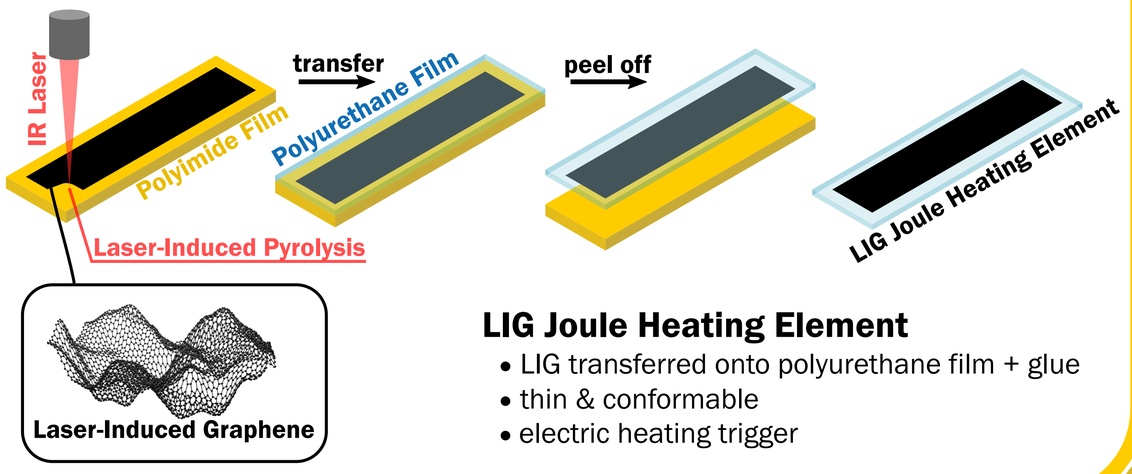
Laser-Induced Graphene - LIG

- laser-scribing graphene conductors into insulating polymer precursors
- possible under ambient conditions, no additional chemicals
- tunable morphology and properties
- scalable & cheap

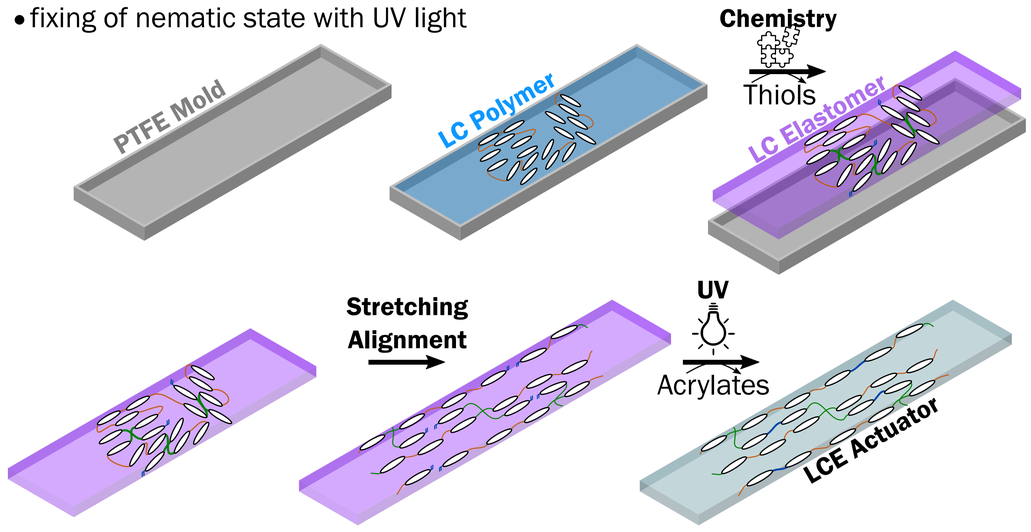


LIG Joule Heating Element

- LIG transferred onto polyurethane film + glue
- thin & conformable
- electric heating trigger

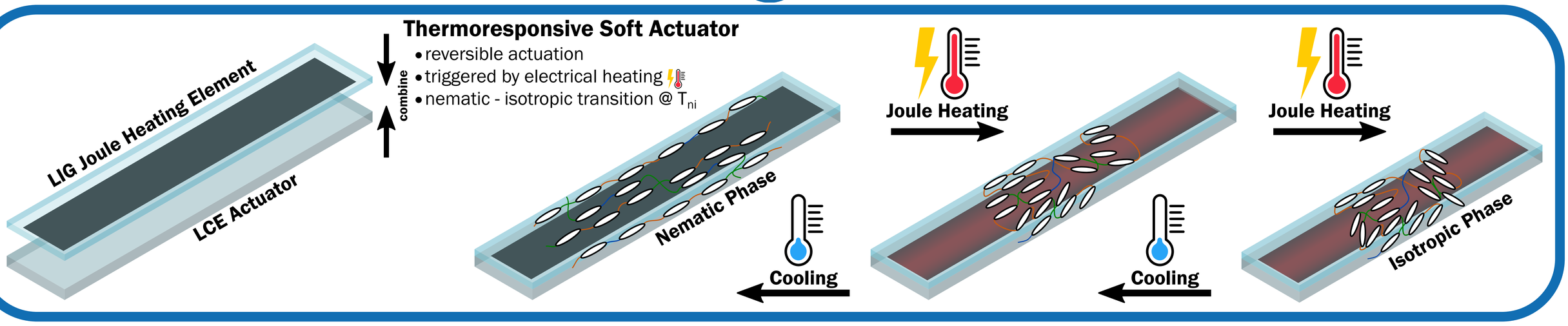
Liquid Crystal Elastomers - LCE

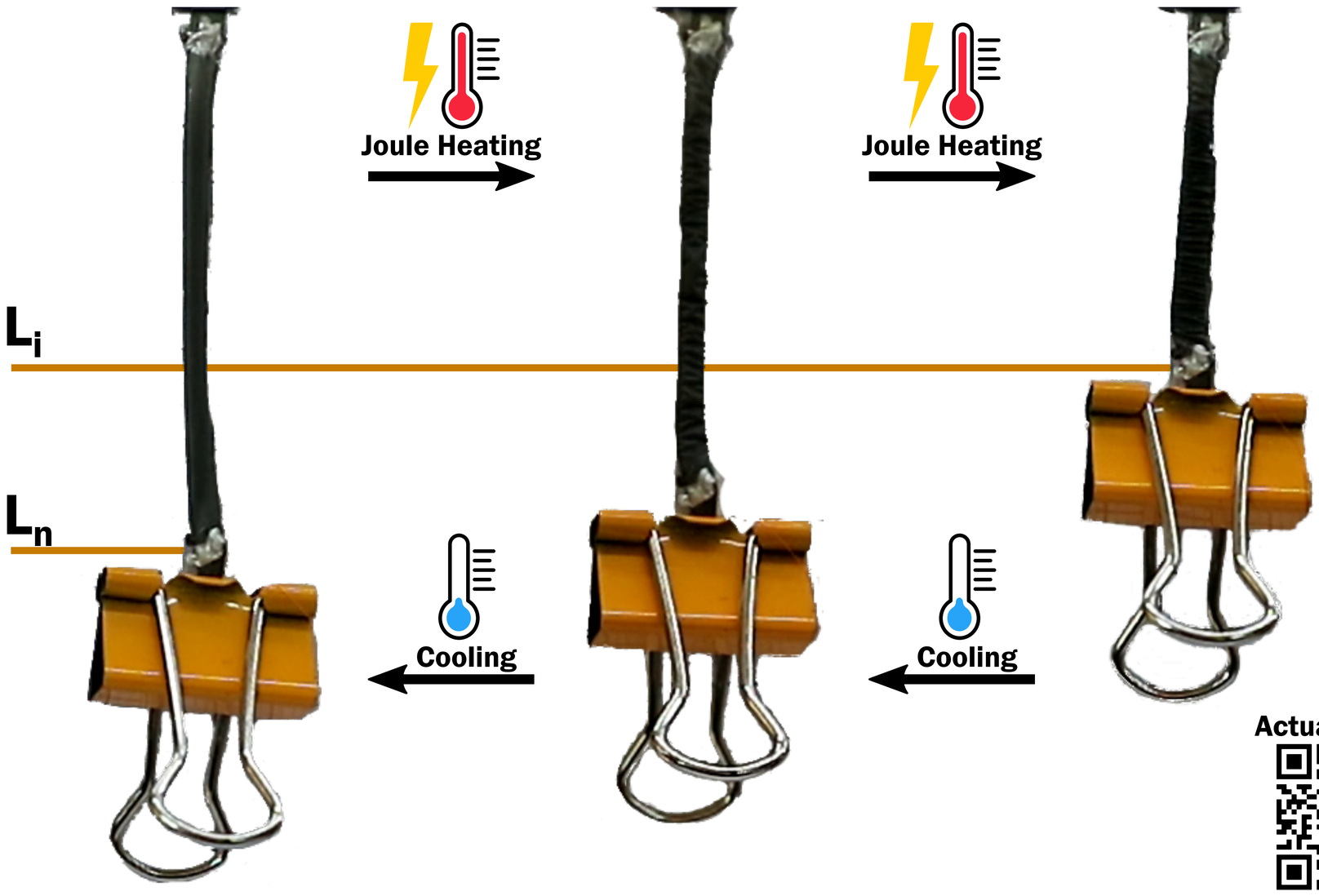
- polymeric liquid crystals forming a 3D, flexible network
- low crosslink density
- combine properties of liquid crystals and elastomers
- fixing of nematic state with UV light



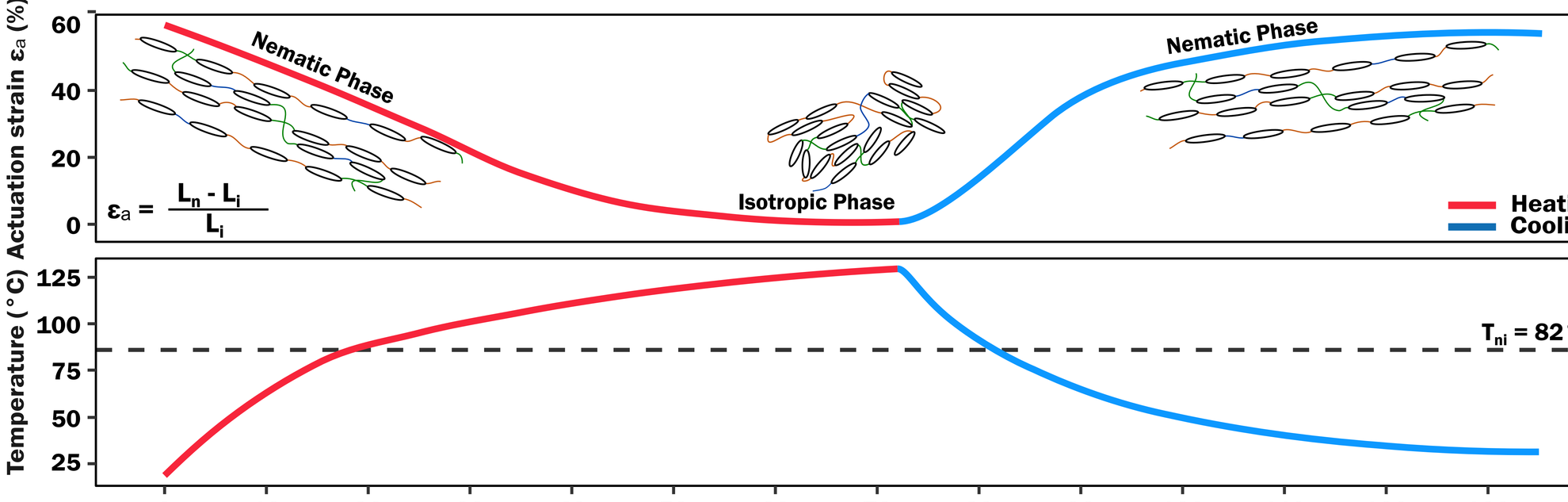
Thermoresponsive Soft Actuator

- reversible actuation
- triggered by electrical heating
- nematic - isotropic transition @ T_{ni}





Actuator Video



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