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Department of Chemical Engineering
& Material Science

HAJIM
SCHOOL OF ENGINEERING
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UNIVERSITY of ROCHESTER

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Mechanochemical Remodeling of Polymeric Materials

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2:15 p.m.
101 Goergen Hall

The forces typical of the macroscopic world (for example, those between a baby's fingers) are many orders of magnitude larger than the forces between the individual atoms of a molecule. For example, breaking a piece of plastic or shearing a polymer solution can lead to bond breaking reactions that initiate material failure. This talk will describe a new strategy for stress-responsive materials, in which functional polymers are developed so as to respond in a constructive, rather than destructive, fashion to large mechanical forces. Specific outcomes include polymers that react to grow irreversibly longer when pulled, polymer that react to grow shorter in response to being pulled, and the nearly instantaneous and reagentless conversion of a single homopolymer into well-ordered diblock copolymers. In addition, a new class of self-healing polymers will be introduced, in which mechanical activation of chemical reactions leads to improved structure and properties under conditions that are typically destructive to both.