

International Webinar on Gels and Networks



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Multiaxial deformation and crack growth of elastomers and gels

ABSTRACT: The large deformation behavior of elastomers and gels are conventionally examined by simple uniaxial deformation, but uniaxial deformation is only a special one among accessible deformations. Biaxial deformation varying independently the two orthogonal strains covers a wide range of strain, providing definite basis for comprehensive understanding of large deformation behavior. Understanding of the crack propagation phenomena is also crucial especially in practical applications. Their large deformability and viscoelasticity result in unique features in crack growth phenomena.

In this talk, we introduce our recent studies using biaxial stretching measurements; the stress-softening behavior (Mullins effect) of DN gels and filled elastomers with different physical origins; the unusual behavior of liquid crystal elastomers to equalize the orthogonal true stresses under unequal biaxial strain. We also reveal the properties of the crack growth with subsonic and supershear speeds, and the effects of stress softening and biaxial stretching on the crack growth for filled elastomers and gels.

GOALS:

- Understand comprehensively the mechanical properties of elastomers and gels based on the nonlinear stress-strain relationships in various deformation modes
- Unveil unique features of crack growth phenomena in elastomers and gels

ABOUT THE WEBINAR:

Due to the ongoing global crisis involving COVID-19, there is little chance for the soft matter community to meet to learn about gels and networks. We propose this seminar as a way for members of the European and Asian communities to share our research and learn from each other, even when social distancing is necessary. The tone of this webinar is informal, and questions can be freely asked at any time. We welcome open discussion, and hope that all who attend will learn a lot!

Webinar website: <http://www.fp.a.u-tokyo.ac.jp/lab/sozai/seminar.html>

Registration: <https://u-tokyo-ac-jp.zoom.us/join/register/tZIkdeiurDMvGdf9ZDsI7otwJN7ojw4Uieoe>

Date: Wednesday, April 21st, 2021

Time: 17:00-18:30 JST, **10:00-11:30 CET**

Cost: Free

Organizers:

Daniel King (Hokkaido University)

Koichi Mayumi (University of Tokyo)

Tetsuo Yamaguchi (University of Tokyo)

Tetsuharu Narita (ESPCI Paris)