Announcement

Artificial Muscles and Soft Lithography

Dr. Masoud Amirkhani

Description

Responsive soft matter shows significant property changes in response to electrical stimulation, PH and other external stimuli, which can be used as actuator, sensor and energy harvester. These types of materials possess very promising potential to be used for minimally invasive medicine, space and automobile application. Additionally soft lithography has been proposed as a cheap and easy method to replace expensive conventional lithography. In this lecture, we will discuss cutting-edge research and technology related to artificial muscles and soft lithography. Furthermore, you will learn the effect of external stimuli on the nanometer and sub-nanometer thick polymeric layer.

Content

- Responsive polymers
- Temperature- and PH-responsive polymers
- Electroactive polymers
- Sensing and actuating
- Soft robotic
- Medical application
- Space application
- Soft nanolithography
- Phase separation of block copolymers
- External stimuli
- Nanometer and sub-nanometer polymers on surface

Prerequisites

A basic knowledge about polymers will be sufficient

Literature

- Electroactive Polymers for Robotic Applications Artificial Muscles and Sensors, Kwang J. Kim and Satoshi Tadokoro
- Biomedical Applications of Electroactive Polymer Actuators, Federico Carpi, Elisabeth Smela
- Electroactive Polymer Gel Robots Modelling and Control of Artificial Muscles, Mihoko Otake

Additional Information

Lecture (2 hours per week)
A combination of report and oral exam.
3 ECTS credits

Lecturer

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