

Universität Bern
Institut für Angewandte Physik
Sidlerstrasse 5
3012 Bern, Schweiz

Telefon:+41 (0)31 631 89 11
E-Mail: iapemail@iap.unibe.ch
www.iap.unibe.ch



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Seminar über Biomedizinische Photonik

Referent/in: PD Dr. Jens Elgeti, Forschungszentrum Jülich, Institute of Complex Systems

Titel: Active matter driven by growth – a particle based model

Active matter is matter, driven out of equilibrium by its microscopic constituents. Now imagine cells dividing or a tumor growing -- a growing material is also active matter. However, activity does not enter via the stress, but in material conservation. The material generates itself. Growth implies a change in volume. In physical terms, the conjugate force to a change in volume is a pressure. Thus, in order to grow, cells must exert mechanical pressure on the neighboring tissue. In turn, pressure influences growth. This yields to interesting novel phenomena like infinite compressibility, self contracting materials and steady tread-milling states.

We use particle based simulations to study mechanical properties and effects in growing matter. These simulations have been helpful in understanding, interpreting and designing experiments. I will present an overview of the simulation technique, and several examples of how this model helped to gain insight in mechanical processes underlying tissue growth, ranging from growth of cancer spheroids under pressure, to in silico competition experiments and tumor evolution.

Zeit: Mittwoch, 12.02.2020, 16:15 Uhr

Ort: **Hörsaal A97**, Gebäude Exakte Wissenschaften, Sidlerstrasse 5, Bern, Schweiz