

# Physikalisches Kolloquium

**Ulrich Schwarz, Universität Heidelberg**  
**»Cells and tissue as active materials«**

*Einführung: G.U. Nienhaus*

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Biological systems such as cells and tissue use non-equilibrium processes to actively generate mechanical stress, movement and growth. Some of these processes can actually be reconstituted in biomimetic experiments with active soft matter. In this talk, we first discuss why and how contractile forces are generated by biological systems and how they can be measured, for example on soft elastic substrates. We then discuss how these contractile systems can be mathematically described by classical continuum mechanics extended by active elements. We finally explain how the local contractility of cells and tissue can be controlled with optogenetics, and how the resulting forces and flows can be used to estimate their material properties.

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**Freitag, 01.07.2016, 15:45 Uhr,**

**KIT, Campus Süd,  
Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).**