

Großes Physikalisches Kolloquium an der Universität zu Köln

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16⁴⁵ Uhr / HS III



Do biological cells care about physics?

While most current biological research focuses on molecular, biochemical aspects of cell and their functioning, we are interested in their global physical properties. I will discuss our recent findings that the mechanical properties of cells determine the physical limits of cell function, for example in cell migration. Cell mechanics can therefore be used to characterize cells, to monitor physiological changes and to diagnose pathological alterations, such as cancer progression. Another example for the importance of physics in biology are the optical properties of cells, specifically in the retina. We have shown that there are cells in the retina that act as optical fibers and that photoreceptor cells even invert their usual nuclear chromatin arrangement to turn them into micro-lenses. Both aspects improve the light transmission through the retina and help to mitigate the disadvantage of its inverted structure. These results provide novel insight into the importance of physics for biological function and even offer new diagnostic and therapeutic avenues for further exploration.

