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Malte C. Gather studied physics and material sciences at RWTH Aachen University and Imperial College London and received his PhD from the University of Cologne with a thesis on organic LEDs. As a postdoc at University of Iceland and later as Bullock-Wellman Fellow at Harvard University he worked on plasmonics and biophotonics, in particular on lasers based on single biological cells. Malte Gather was assistant professor at TU Dresden (Germany) from 2011 to 2013 before getting a full professorship at the University of St Andrews (UK). His research area is at the interface between biophotonics and organic semiconductors.

ABSTRACT

Long-term and reference-free measurements of cellular forces

We introduce a novel approach to quantitatively image the force pattern exerted by live cells and show its application in several areas, ranging from basic cell adhesion and division studies to cell-culture level disease models of kidney injury and cancer invasion. Elastic Resonator Interference Stress Microscopy (ERISM) is based on analyzing cell-induced local changes in the resonances of an ultra-soft and elastic optical micro-cavity. This overcomes many limitations of existing methods, enables fast displacement mapping - if required even online - and offers a large dynamic range and nm-accuracy (sub-Pa stress resolution).