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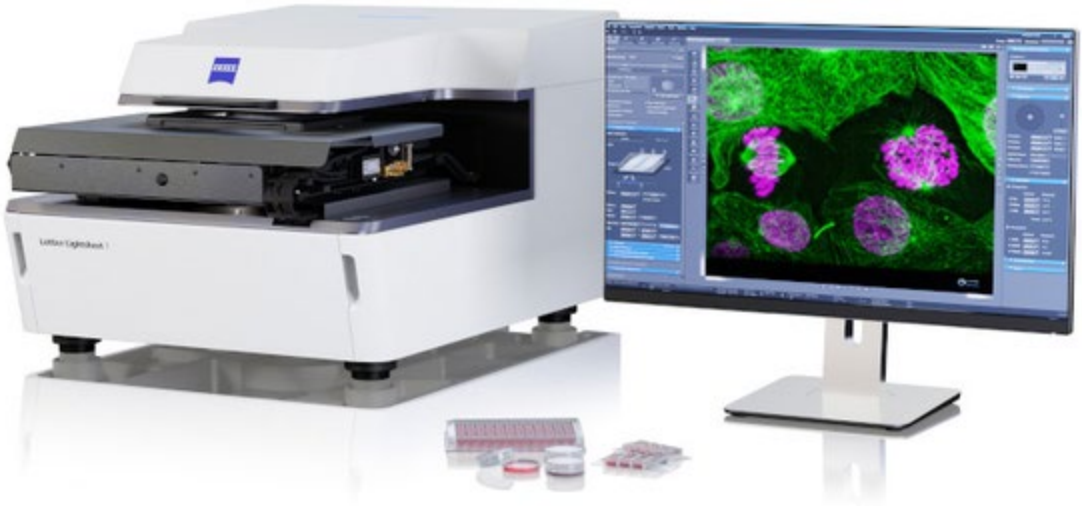
How to tame a lattice lightsheet

Dr Jonathan Shewring

Carl Zeiss Ltd, Cambourne, United Kingdom

Abstract



The key challenge in live cell imaging is acquiring images at the necessary spatiotemporal resolution without changing the physiology of the cells. In 2014, Noble laureate Eric Betzig reported the successful development of a new microscope promising to meet this major challenge, the lattice lightsheet. This new breed of microscope offered speeds measured in volumes per second instead of the more commonly used frames per second, redefining speed in live cell imaging. All done whilst achieving subcellular resolution, substantially increasing the amount of 4D information available to the user.

The final key attribute making the lattice lightsheet unique is sensitivity, calculated to be ~100 times more gentle than any live cell spinning disk microscope. Whilst lattice lightsheet is supremely positioned as the best live cell imaging system available, they are extremely challenging optically to build and maintain. In addition, the systems are limited to upright configurations requiring use of custom 5 mm coverslips with dipping lenses. In this talk we will discuss how ZEISS have taken on these challenges and tamed the lattice lightsheet.