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Abstract Title:	PEAR - Plasmonic Electronically Addressable super-Resolution: Unravelling bio- medically relevant nanoscale processes via high resolution, real-time, plasmonically enabled nanoscopy
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Abstract: [250 words max] Please provide an abstract that briefly describes: <i>i) the problem being addressed in the study</i> <i>ii) how the study was performed</i> <i>iii) the salient results</i> <i>iv) what the authors conclude from the results</i>	
<p>PEAR offers an innovative solution for the next generation of microscopy. The method achieves imaging beyond the far-field diffraction limit (~200 nm) via addressable plasmonic elements, which act similar to sensor pixels, offering below 25 nm spatial resolution.</p> <p>The photonic chip contains an electronically addressable array of metallic nano-elements, acting as quasi-pixels. These pixels can be switched from "on-resonance" to "off-resonance" via a modulated current. This modulation results in appreciable changes of the electric near-field strength above the pixels, which can be detected via optical heterodyne detection.</p> <p>The ability to rapidly address these active plasmonic elements and to encode information in the way the pixels are addressed enables retrieval of spatial information in the far-field, leading to sub-diffraction-limit imaging. Because of the known, nano-localised addressability of the modulation, a dedicated computer algorithm is capable of extracting the contained information. A second benefit of the pixel-addressing is the resulting capability to read-out all the spatial information in one step, which leads to unprecedented speed of image acquisition hence providing real-time imaging of biological systems at the nanoscale level.</p> <p>This award-winning solution is bio-compatible and can easily be retrofitted into existing commercially available microscopes and will provide a greatly improved in-depth understanding of subcellular mechanisms and even macromolecular reactions in real-time. In order to provide evidence for the capabilities of our new invention we have chosen to focus onto the transfer mechanism of melanin granules by filopodia as a relevant proof of concept.</p>	



2019 UCD Conway Festival of Research & Innovation
UCD Conway Festival Medal - Abstract Submission Template

Research Theme:	<p><i>Please tick one of the following as appropriate to your research:</i></p> <p>Underpinning Biosciences Research <input checked="" type="checkbox"/> One Health <input type="checkbox"/></p> <p>Personalised & Translational Medicine <input type="checkbox"/></p>
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