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Nanostructured materials for broadband light detection¹

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Graphene and other atomically thin materials like transition metal dichalcogenides have recently emerged as versatile building blocks for optoelectronics and light detection. For a gapless material like graphene, light absorption occurs in a wide energy range, including ultraviolet, visible, telecom and terahertz radiation, a region of the electromagnetic spectrum where highly sensitive detection is notoriously difficult. Light absorption in graphene causes a large increase in electron temperature, making it an ideal material for hot-electron bolometers. Here we show that graphene nanostructured into quantum dots yields hot electron bolometers with extraordinary performance for broadband photodetection, with a design that is easily scalable and suitable for detector arrays. A. El Fatimy, R. L. Myers-Ward, A. K. Boyd, K. M. Daniels, D. K. Gaskill and P. Barbara, *Nature Nanotechnology* 11, 335-338 (2016)

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