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Abstract for an Invited Paper
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Ballistic surface plasmons in high mobility Dirac liquid of graphene

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Optical spectroscopies are an invaluable resource for exploring new physic of new quantum materials. Surface plasmon polaritons and other forms of hybrid light-matter polaritons provide new opportunities for advancing this line of inquiry. In particular, polaritonic images obtained with modern nano-infrared tools grant us access into regions of the dispersion relations of various excitations beyond what is attainable with conventional optics. I will discuss this emerging direction of research with two examples from graphene physics: *i)* ultrafast dynamics of hot photo-excited electrons [2]; and *ii)* ballistic electronic transport at low temperatures [3].\pard\pard\pard[1] D.N. Basov, M.M. Fogler and F. J. Garcia de Abajo "*Polaritons in van der Waals materials*", Science 354, 195 (2016).\[2] G. X. Ni, L. Wang, M. D. Goldflam, M. Wagner, Z. Fei, A. S. McLeod, M. K. Liu, F.Keilmann, B. Özyilmaz, A. H. Castro Neto, J. Hone, M. M. Fogler and D. N. Basov *Nature Photonics* **10**, 244 (2016)\[3] G. X. Ni, A. S. McLeod, L. Xiong et al. [in preparation].