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Sommario/riassunto	This thesis presents significant advances in the imaging and theory of the ultrafast dynamics of surface plasmon polariton fields. The author details construction of a sub-10 femtosecond and sub-10 nanometer spatiotemporal resolution ultrafast photoemission microscope which is subsequently used for the discovery of topological meron and skyrmion-like plasmonic quasiparticles. In particular, this enabled the

creation of movies of the surface plasmon polariton fields evolving on sub-optical wavelength scales at around 0.1 femtosecond per image frame undergoing vortex phase evolution. The key insight that the transverse spin of surface plasmon polaritons undergoes a texturing into meron or skyrmion-like topological quasiparticles (defined by the geometric charge of the preparation) follows. In addition, this thesis develops an analytical theory of these new topological quasiparticles, opening new avenues of research, while the ultrafast microscopy techniques established within will also be broadly applicable to studies of nanoscale optical excitations in electronic materials.