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Electromagnetic interactions near the black hole horizon

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In this talk, I will describe a theory for scalar QED near the black hole event horizon. In particular, I will show how to compute the electromagnetic eikonal S-matrix from elastic $2 \longrightarrow 2$ scattering of charged particles exchanging soft photons in the black hole eikonal limit. The resulting ladder resummation agrees perfectly with the result from the first quantised formalism developed by 't Hooft, whereas the field-theoretic formulation allows for a computation of a wider range of amplitudes. Some possible applications of the formalism developed here will be also discussed.

Primary author: FELEPPA, Fabiano (University of Salerno and INFN, Salerno)

Co-authors: Dr GADDAM, Nava (International Centre for Theoretical Sciences, Tata Institute for Fundamental Sciences, Bengaluru 560089, Karnataka, India); Mr GROENENBOOM, Nico (Institute for Theoretical Physics and Center for Extreme Matter and Emergent Phenomena, Utrecht University, 3508 TD Utrecht, The Netherlands)

Presenter: FELEPPA, Fabiano (University of Salerno and INFN, Salerno)

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