



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

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## M. E. Taylor Analysis and PDE Seminar

October 4, 2023  
3:30 - 4:30 p.m.  
Phillips Hall 385

### Homogenization of the Einstein equations under symmetry

Rita Teixeira da Costa (Princeton, Trinity College)

**Abstract.** Due to their nonlinear nature, the Einstein's equations are not closed under weak convergence. Compactness singularities associated to highly oscillatory solutions may be identified with additional, non-trivial matter. In 1989, Burnett conjectured that, for vacuum sequences, the matter produced in the limit is captured by the Einstein-massless Vlasov model.

In this talk, we give a proof of Burnett's conjecture under some gauge and symmetry assumptions, improving previous work by Huneau—Luk from 2019. Our methods are more general, and apply to oscillating sequences of solutions to the wave maps equation in  $(1+2)$ -dimensions. This is joint work with Andre Guerra (ETH Zurich).