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Foliations of globally hyperbolic manifolds

In this talk, I will give an overview over recent developments in the theory of Cauchy foliations of globally hyperbolic manifolds. A Cauchy foliation is a one-codimensional foliation whose leaves are Cauchy hypersurfaces. One can ask for additional properties, such like orthogonality of the foliation, or bounds on the characteristic quantities as lapse and shift (or, in geometric terms, gradient of the time function and Weingarten tensor of the Cauchy hypersurfaces). Apart from the obvious relevance of these foliations for the different formulations of the initial value problem in general relativity, I will sketch shortly some applications in the theory of minimal surfaces and in Nash type embedding theorems for Lorentzian manifolds.