

Boundary regularity of non-linear parabolic systems

In this talk we shall consider Cauchy-Dirichlet problems associated with non-linear parabolic systems of the type

$$\partial_t u - \operatorname{div} a(x, t, Du) = 0,$$

with Hölder continuous dependence on (x, t) . We present a necessary and sufficient criterion for a boundary point to be regular, i.e. to be a Hölder continuity point for the spatial gradient of solutions. Moreover, we shall establish that indeed almost every boundary point, with respect to the usual surface measure of the parabolic boundary, is regular. Note that due to counterexamples everywhere regularity fails to hold in general. The results presented are obtained in collaboration with F. Duzaar from the University of Erlangen and G. Mingione from the University of Parma.