

# First Joint Meeting Brazil Italy of Mathematics

## Special Session: Elliptic PDEs

Rio de Janeiro, August 29 - September 02, 2016

**Title:** Geometric boundary regularity for fully nonlinear elliptic equations

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**Abstract:** In [Ann. of Math. (2) 130 (1989), no. 1, 189-213], Luis Caffarelli developed his famous  $W^{2,p}$  regularity theory for convex fully nonlinear operators, with continuous coefficients. The question on whether these estimates could be established for general non-convex equations challenged the community for nearly thirty years, when Nadirashvili and Vladut built up counterexamples. In this talk, we obtain  $W^{2,p}$  boundary estimates for solutions of fully nonlinear elliptic equations under certain assumptions on the asymptotic behavior of the operator  $F$  at the ends of  $\mathcal{S}(n)$ . This analysis rests upon the recession function of  $F$  ? a notion coming from the theory of free boundary problems ? which is formally defined by  $F^\infty(M) = \infty^{-1}F(\infty M)$ . Our arguments are based on compactness methods and techniques from the so-called geometric tangential analysis. As an application, we investigate the regularity of solutions in  $p$ -BMO spaces.

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