



UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE

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Seminario di Analisi Matematica



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Fractional regularity for (non-fractional) fully nonlinear PDE

Mercoledì 22 giugno 2022, ore 15:30

Sala Riunioni, III piano, Plesso di Matematica

Tutti gli interessati sono invitati a partecipare

Organizzatori proff. Alessandra Lunardi e Giampiero Palatucci

Abstract: We discuss a fractional regularity theory for fully nonlinear elliptic equations without further conditions on the underlying operator. Although convexity-like assumptions unlock integral estimates for the weak Hessian of the solutions, merely elliptic operators lead to regularity results in fractional Sobolev spaces. First, we show that fractional derivatives inherit the integrability of the source term; this fact follows from approximation methods by adjusting the geometry of the touching functions. Then we resort to a flipping-geometry result and prove that subsolutions with a modulus of continuity of class $C^{1,\alpha}$ from below are in $W^{1+\alpha,p}$ for every $p > d$. We close the talk with two applications of recent ideas, covering the fractional regularity of the convex envelope and a fractional counterpart of a result by Caffarelli-Kohn-Nirenberg-Spruck. This is based on joint works with E. Teixeira (USA) and M. Santos (Portugal), and D. Moreira (Brasil).