April 19, 2021

Monday's Nonstandard Seminar 29

15:00

Author: Andrea Gentile (University of Naples "Federico II")

Title: **Regularity results for solutions to some non-autonomous variational problems with sub-quadratic growth conditions**

Abstract: The aim of this talk is to show some regularity properties of local minimizers of integral functionals of the form

$$\mathcal{F}(v,\Omega)=\int_{\Omega} f(x,Dv(x))\,dx,$$

where the function f satisfies $p-$growth conditions with respect to the gradient variable, for $1<p<2$, provided the partial map $x\mapsto D_{\xi}f(x,\xi)$ belongs to a suitable Sobolev or Besov-Lipschitz space.
The results deal both with solutions to unconstrained problems, for which $W^{2,p}$ regularity is proved in case the map $x\mapsto D_{\xi}f(x,\xi)$ belongs to a Sobolev space $W^{1,q}$ for $q\geq n$ (see [1]), and solutions to obstacle problems, for which higher differentiability results are proved both in case $x\mapsto D_{\xi}f(x,\xi)$ belongs to the Sobolev space $W^{1,n}$ and to a suitable Besov-Lipschitz space $B^{\alpha}_{p,q}$ (see [2]).

References

[1] A. Gentile. *Regularity for minimizers of a class of non-autonomous functionals with sub-quadratic growth.* Adv. Calc. Var. (2020).

[2] A. Gentile. *Higher differentiability results for solutions to a class of non-autonomous obstacle problems with sub-quadratic growth conditions.* Forum Math. (2021).