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## SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 24 de Março (sexta-feira), às 15h00, sala 6.2.38

# Characterization of Sobolev Spaces Through Functionals without Derivatives Dependence

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**Abstract:** Extending previous works due to Bourgain, Brézis, and Mironescu [J. Anal. Math. 87 (2002)] and Leoni and Spector [J. Funct. Anal. 261, 10 (2011)], we provide new characterizations of Sobolev spaces in terms of functionals involving difference quotients. These characterizations have their origin on the study of the limit behavior of the Gagliardo semi-norms taken by Bourgain, Brézis, and Mironescu and may have some applications to imaging problems. Our results include classical higher-order Sobolev spaces as well as the variable exponent case. More general spaces as Musielak-Orlicz spaces will also be discussed. This talk is a consequence of a joint work with C. Kreisbeck and R. Ferreira [Nonlinear Analysis: Theory, Methods & Applications (2015)] and with P. Hästö [Communications in Contemporary Mathematics (2016 online ready)].

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