

## Free Boundary Problems in PDEs and Related Issues

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**Título:** Geometric estimates for doubly degenerate parabolic PDEs.

**Resumo:** In this Lecture we obtain local Hölder regularity estimates for bounded solutions of a certain class of doubly degenerate evolution PDEs, whose simplest model case is given by

$$\frac{\partial u}{\partial t} - \operatorname{div}(|u|^{m-1}|\nabla u|^{p-2}\nabla u) = f \in L^{q,r}(U_T),$$

for  $m \geq 1$ ,  $p \geq 2$  and appropriate integrating exponents  $q, r \in [1, \infty)$ . By making use of intrinsic scaling techniques and geometric tangential methods, we derive sharp regularity estimates for such models, which depend only on universal and compatibility parameters of the problem. Finally, our results are natural extensions for former ones (cf. [J. Anal. Math. 140(2020), n. 2, 395 – 407], [J. Differential Equations 269(2020), no. 12, 10558 – 10570] and [Anal. PDE 7(2014), no. 3, 733 – 744]) in the context of nonlinear evolution PDEs with degenerate structure via a unified approach. This is a joint work with J.V. da Silva (UNICAMP - Brasil) and G. C. Ricarte (Universidade Federal do Ceará - Brazil)