Research

Analysis Seminário de Análise

Recent Trends in Free Boundary Problems

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Auditorium

Abstract.

In this Lecture we will present a series of recent results on some classes of free boundary problems. Differently from the classical literature, the problems considered have either a "nonlocal" feature or a "nonlinear" flavor. The insights behind the exposition consist of explaining their mathematical relevance, intrinsic difficulties in being overcome and applications in other classes of problems. The complete proofs and details of the results presented are given in [1], [2], [3], [4] and [5]. At the end of the Lecture, we will present new directions and some mathematical expectations for the next years.

References

[1] J.V. da Silva, P. Ochoa & A. Silva, *Regularity for degenerate evolution equations with strong absorption*. **J. Differential Equations** 264 (2018), no. 12, 7270-7293.

[2] J.V. da Silva & J.D. Rossi, *The limit as $p \to \infty$ in free boundary problems with fractional $p-$Laplacians*. **Trans. Amer. Math. Soc.** 371 (2019), no. 4, 2739-2769.

[3] J.V. da Silva, J. Rossi & A. Salort, *Regularity properties for $p-$dead core problems and their asymptotic limit as $p \to \infty$*. **J. London Math. Soc.** (2) 99 (2019) 69-96.

[4] J.V. da Silva & A. Salort, *Sharp regularity estimates for quasi-linear elliptic dead core problems and applications*. **Calc. Var. Partial Differential Equations** 57 (2018), no. 3, Art. 83, 24 pp.

[5] J.V. da Silva & A. Salort, *A limiting obstacle type problem for the inhomogeneous $p-$fractional Laplacian*. **Calc. Var. Partial Differential Equations** 58 (2019), no. 4, Art. 127, 29 pp.