

Postdoctoral Fellow — KAUST, Saudi Arabia

# AELSON SOBRAL

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**RESEARCH INTEREST** Regularity theory for nonlinear PDEs, Variational methods, Singular Free Boundary problems, and Maximum principles for nonlinear PDEs.

**EDUCATION** **Universidade Federal da Paraíba** (UFPB), João Pessoa, Brazil      2020–2024

Ph.D. in Mathematics

- Supervisors: Damião Araújo and Eduardo Teixeira.

**Universidade Federal de Sergipe** (UFS), São Cristóvão, Brazil      2016–2020

B.Sc. & M.Sc. in Mathematics

- Supervisor: Disson dos Prazeres

**AWARDS** *Lenilde Duarte de Sá* prize for outstanding thesis at UFPB.

**EXPERIENCE** **Postdoctoral Fellow**      2024–present

King Abdullah University of Science and Technology (KAUST), Saudi Arabia

- Supervisor: José Miguel Urbano

**Visiting Researcher**      2023–2024

PUC-Rio

- Supervisor: Boyan Sirakov

**Research Exchange Program**      2022–2023

University of Central Florida, USA

- Supervisor: Eduardo Teixeira

**SELECTED WORK** [1] D. Araújo, A. Sobral, J.M. Urbano, and E. Teixeira, *On free boundary problems shaped by varying singularities*. To appear in Calc. Var. Partial Differential Equations (2026).

[2] D. Araújo, A. Sobral, E. Teixeira, *Regularity in diffusion models with gradient activation*, J. Func. Anal. 289 (2025), no. 11, Paper No. 111147, 31 pp.

[3] D. Dos Prazeres, A. Sobral, R. Teymurazyan, *The fractional Laplacian uncovered*. Colóquio Brasileiro de Matemática (2025).

[4] A. Sobral, E. Teixeira, J. M. Urbano, *Degenerate free boundary problems with oscillatory singularities*, Partial Differ. Equ. Appl. 6 (2025), no. 2, Paper No. 14, 16 pp.

[5] D. Dos Prazeres, A. Sobral, and J. M. Urbano, *Cordes-Nirenberg type results for nonlocal equations with deforming kernels*, J. Func. Anal. 287 (2024), no. 9, Paper No. 110593, 33 pp.

[6] D. Araújo, A. Sobral, J.M. Urbano, and E. Teixeira, *Borderline regularity in singular free boundary problems*. Submitted.

[7] B. Sirakov and A. Sobral, *Keller-Osserman and Harnack type results for nonlinear elliptic PDE with unbounded ingredients*. Submitted.

**JOURNAL PEER  
REVIEW**

- Nonlinear Analysis: Theory and Applications
- Bulletin of the Brazilian Mathematical Society
- Revista Matemática Iberoamericana
- Potential Analysis

**ORGANIZING  
COMMITTEES**

**2026**

- Special session at the AIMS conference, Athens, Greece.

**2024**

- Special session at the AIMS conference, Abu Dhabi, UAE.
- Free boundary problems: Theory & applications, João Pessoa, Brazil.
- Analysis of PDEs: Theory & Applications, João Pessoa, Brazil.

**CONFERENCES 2025  
& SEMINARS**

- AMCS School (KAUST)
- Invited speaker at special session of the Mathematical Congress of the Americas, Miami, USA.
- Speaker in advanced courses session at the Brazilian Colloquium of Mathematics (CBM), IMPA, Rio de Janeiro, Brazil.
- Invited speaker at the workshop on analysis and PDEs, KAUST, Saudi Arabia.
- AMCS Graduate Seminar, KAUST, Saudi Arabia.

## **2024**

- Invited speaker at Mostly Maximum Principle conference, PUC-Rio, Brazil.
- Invited speaker at ICMC summer meeting, UFSCAR, São Carlos, Brazil.

## **2023**

- Analysis seminar at Federal University of Paraíba (UFPB), João Pessoa, Brazil.
- Analysis seminar at Wayne State University (online).
- Poster presentation at the XII Workshop on Nonlinear Differential Equations, UNB, Brazil.
- Invited speaker at special session of 13th AIMS conference, UNCW, North Carolina, USA.
- Invited speaker at special session of the Brazilian Colloquium of Mathematics (CBM), IMPA, Rio de Janeiro, Brazil.

## **2021**

- XIV ENAMA (online).
- Poster presentation at MCA (online).
- Contributed talk at [B\_1^-]: Analysis and PDE from the south (online).

