

PREFACE
SPECIAL ISSUE ON
“VARIATIONAL, TOPOLOGICAL AND SET-VALUED METHODS
FOR NONLINEAR DIFFERENTIAL PROBLEMS”

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This special issue follows the associated Special Session SS34 with the same name from The 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications in Wilmington, USA (May 31 - June 4, 2023). The focus of this session was the qualitative analysis of nonlinear differential problems. In particular, the main purpose was to give an update on recent developments concerning ordinary and partial differential equations, variational-hemivariational inequalities, difference and algebraic systems obtained by exploiting different methods of the nonlinear analysis such as critical point theory, fixed point theorems, topological degree, Morse theory, set-valued analysis, and so on.

We would like to thank all of the authors for their valuable scientific contributions and all of our colleagues for their support and cooperation, without which we could not have produced this volume.

In addition, we would like to thank Professor Xiaoying Han and Professor Alain Miranville, Editors-in-Chief of DCDS-S, for their support in carrying out the special issue.

Overall, 16 research papers on recent trends on the qualitative analysis of nonlinear differential problems are included in this special issue:

- [1] E. Amoroso, V. Morabito, *Nonlinear Robin problems with double phase variable exponent operator.*
- [2] I. Benedetti, F. Fennour, E. Palazzoni, *Parabolic differential inclusions with strongly elliptic differential operators and superlinear growths.*
- [3] G. Bonanno, B. Di Bella, V. Morabito, *Multiple solutions for fourth-order ordinary differential inclusions.*
- [4] P. Candito, R. Livrea, L. Sanchez, *Existence and approximation of a solution for a two point nonlinear Dirichlet problem.*
- [5] S. Carl, *Quasilinear noncoercive bilateral hemivariational inequalities in $\mathcal{D}^{1,p}(\mathbb{R}^N)$: Existence and compactness results.*
- [6] X. Chen, N. Costea, S. Zeng, *A generalized penalty method for quasi-variational-hemivariational inequalities.*
- [7] Francesca Colasuonno, Benedetta Noris and Elisa Sovrano, *Continuous dependence for p -Laplace equations with varying operators.*
- [8] Á. Crespo-Blanco, *Monotonicity formulas and (S_+) -property: Old and new.*
- [9] Silvia Frassu and Giuseppe Viglialoro, *Addendum to the paper “Refined criteria toward boundedness in an attraction-repulsion chemotaxis system with nonlinear productions”.*

- [10] S. Gnanasekaran, A. Columbu, R. Díaz Fuentes, N. Nithyadevi, *Global existence and lower bounds in a class of tumor-immune cell interactions chemotaxis systems.*
- [11] A. Harrabi, M.K. Hamdani, A. Fiscella, *Multiplicity of solutions for a higher m -polyharmonic Kirchhoff type equation on unbounded domains.*
- [12] E. Ipocoana, V. Taddei, *On multiplicative time-dependent perturbations of semigroups and cosine families generators.*
- [13] Y.-H. Kim, C.Y. Park, S. Zeng, *Infinitely many small energy solutions to the p -Laplacian problems of Kirchhoff type with Hardy potential.*
- [14] R. Livrea, B. Vassallo, *Three weak solutions to a periodic boundary Sturm-Liouville problem with discontinuous reaction.*
- [15] F. Mennuni, A. Salvatore, *Multiple solutions for quasilinear elliptic problems with concave and convex nonlinearities.*
- [16] N.S. Papageorgiou, J. Zhang, W. Zhang, *Global existence and multiplicity of solutions for nonlinear singular eigenvalue problems..*

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