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Editors

Nonlinear Analysis, Geometry and Applications

Proceedings of the Second
NLAGA-BIRS Symposium,
Cap Skirring, Senegal,
January 25–30, 2022

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Preface

This volume contains the proceedings of the Nonlinear Analysis, Geometry and Applications—Proceedings of the Second NLAGA-BIRS Symposium, held at Cap Skirring and University Assane Seck, in Ziguinchor, Sénégal, on January 25–30, 2022.

The NLAGA's Biennial International Research Symposium (NLAGA-BIRS) is intended to gather African expertise in non-linear analysis, geometry, and their applications with their international partners in a 5-day conference where new mathematical results, in various directions, are presented and discussed. It is closed by an open day with an exhibition of posters, addressed to students of the second scientific series to the scientific final year of secondary education in the Ziguinchor Region of Senegal.

The purpose of this book is to gather the best papers presented during this Biennial. The different topics addressed are related to partial differential equations, complex analysis, geometric analysis, inverse problems, optimization, control theory, mathematical modeling, probability and statistics, geometry, and algebra and applications.

The main focus of the NLAGA project is to deepen and consolidate the development of non-linear analysis, geometry, and their applications in West and Central Africa to solve, in particular, real-world problems such as coastal erosion, urban network, pollution problems, population dynamics. See the following website for more details: <http://nlaga-simons.ucad.sn>.

The chapters in this volume give an insight into cutting -edge research activities and thought leadership in mathematical sciences in Africa and internationally. Mathematical modeling, controllability theory, optimization, probability, and statistics can be found in the first seven chapters. Partial differential equations and inverse problems are the topics of the next five chapters. They are followed by five chapters in complex analysis and geometric analysis. Finally, results in geometry, algebra, and real algebraic geometry are discussed in the final five chapters.

This symposium has been widely supported by the NLAGA Grant funded by Simons Foundation; the Ministry of Higher Education, Research and Innovation of Sénégal; the Ministry of Finance and Budget of Sénégal; Assane Seck University

of Ziguinchor, Sénégal (Laboratory of Mathematics and Applications, Education and Research Unit of Science and Technology, Department of Mathematics); Cheikh Anta Diop University (UCAD) of Dakar, Sénégal (Faculty of Economics and Management, Faculty of Science and Technology); Alioune Diop University of Bambey (Rectorat and Training and Research Unit for Applied Sciences and Information and Communication Technology); African Institute for Mathematical Sciences, Mbour, Sénégal; the African Center of Excellence in Mathematics and Computer Sciences at the University Gaston Berger (UGB) in Saint Louis, Sénégal; the National Academy of Sciences and Technics of Sénégal; Polytechnic School of Thiès, Sénégal; the University of Sine Saloum El Hadji Ibrahima Niass; and Cheikh Anta Diop University, Sénégal.

We wish to thank all the contributors to this symposium for making it an outstanding scientific and intellectual event. We also thank all the invited speakers, full professors, and research directors (Gérard Besson, Grenoble, France; Gilles Courtois, Paris, France; Alexandre Girourad, Laval, Canada; Jimmy Lamboley, Paris, France; Volker Schulz, Trier, Germany; Yuri Tschinkel, New York, USA; and Ahmed Zériaïhi, Toulouse, France) for their acceptance to deliver outstanding lectures. Finally, we thank deeply all the referees who dedicated their valuable time to review all the submitted papers.

Dakar-Fann, Senegal
Abidjan, Ivory Coast
Libreville, Gabon
Ziguinchor, Senegal

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