Preface

Jaqueline G. Mesquita

Department of Mathematics,
Universidade de Brasília,
Campus Universitário Darcy Ribeiro,
70910-900, Brazil
Email: jgmesquita@unb.br

Martin Bohner

Department of Mathematics and Statistics,
Missouri University of Science and Technology,
400 West 12th Street,
Rolla, MO 65409-0020, USA
Email: bohner@mst.edu

Carlos Lizama

Departamento de Matemática y Ciencia de la Computación,
Universidad de Santiago de Chile,
Las Sophoras 173, Estación Central, Santiago, Chile
Email: carlos.lizama@usach.cl

Hideaki Matsunaga

Department of Mathematical Sciences,
Osaka Prefecture University,
Sakai, Osaka 599-8531, Japan
Email: hideaki@ms.osakafu-u.ac.jp

Biographical notes: Jaqueline Godoy Mesquita completed her PhD in 2012 at the University of São Paulo with a period at the Academy of Sciences of Czech Republic in Prague. She is Professor at University of Brasília since 2015. In 2018, she was elected young affiliate member of The World Academy of Sciences (TWAS-LACREP) and of the Brazilian Academy of Sciences (BAS). In 2019, she was Humboldt/Capes fellow in Germany. She won the prize 'For Women in Sciences' awarded by L'Oréal, UNESCO and BAS in 2019 in Mathematics. Her research interests centre around functional differential equations and dynamic equations on time scales.

Martin Bohner is the Curators' Distinguished Professor of Mathematics and Statistics at Missouri S&T in Rolla, Missouri, USA. He received an MS (1993) in Econo-mathematics and PhD (1995) from University Ulm, Germany, and MS (1992) in Applied Mathematics from San Diego State University. He is a Past President of ISDE, the International Society of Difference Equations. His research interests centre around differential, difference, and dynamic equations as well as their applications to economics, finance, biology, physics,

and engineering. He is the author of seven textbooks and more than 300 publications, cited more than 16000 times in the literature.

Carlos Lizama is full Professor at the Universidad de Santiago de Chile. He received a PhD (1990) from the University of Stuttgart, Germany, and a research award from the Alexander von Humboldt foundation (1997). With an h-index of 23, he is the author of three textbooks and more than 160 publications cited more than 2000 times in the literature, according to the Scopus database. His research interests centre around the theory of evolution equations, with special emphasis on non-local models in discrete and continuous time, as well as their applications to bioengineering and physics. He has supervised ten PhD students.

Hideaki Matsunaga received his PhD from Osaka Prefecture University, Japan in 2002. He has been a full Professor of Department of Mathematical Sciences, Osaka Prefecture University since 2014. His main research is to construct qualitative theory of delay equations. More specifically, he is interested in stability and oscillation for solutions of differential equations, difference equations, and integral equations with finite or infinite delays.

We are very honoured and pleased to present this special issue on '*Differential, Difference and Dynamic Equations*' of the *International Journal of Dynamical Systems and Differential Equations*. This volume collects important papers containing recent results related to the qualitative properties and asymptotic behaviour of solutions of differential equations, difference equations, and dynamic equations on time scales. Also, in this volume, there are relevant applications of these equations to model important real-world phenomena.

    The call for papers prepared by the guest editors for this special issue encouraged a huge variety of topics including pullback and forward attractors, oscillation theory, asymptotic behaviour, stability, optimal control, as well as the investigation of important types of equations such as delay equations, stochastic equations, Volterra integrodifferential equations, fractional difference equations, among others. In total, 12 research papers have been selected for this special issue, containing relevant and impacting results in the areas of differential, difference, and dynamic equations on time scales, as we describe below.

    The paper by Appleby presents a mean square characterisation of a stochastic Volterra integrodifferential equation with delay. Atici and Bennett investigate the discrete Ponzi scheme model through Sturm–Liouville theory, Bohner et al. investigate a first-order non-linear dynamic initial value problem. The paper by Cuchta and Georgiev brings an analysis of the bilateral Laplace transform on time scales and applications. Cuchta and Streipert present a discrete SIS model of fractional order, Goswami investigates a model of Zika virus with saturated incidence using optimal control, Huynh and Kalkan investigate the pullback and forward attractors of contractive difference equations, Jonnalagadda and Gopal study linear Hilfer nabla fractional difference equations. Lapierre and Tikjha investigate the global behaviour of a system of piecewise linear difference equations, Lawaniya et al. study the effect of pollution on predator-prey systems, Luey and Usami present some applications of generalised Riccati equations in the investigations of asymptotic forms of solutions of perturbed half-linear

ordinary differential equations. Also, Pinelas et al. investigate oscillatory and stability of a mixed-type difference equation with variable coefficients.

The editors expect that the collection of the papers contained in this special issue be a valuable source of inspiration and plays an important role for the development of the qualitative theory of differential equations, difference equations, and dynamic equations on time scales in the future, stimulating relevant and impacting results to the area.

Acknowledgements