Preface

The field of nonlinear science has evolved from being a valuable theoretical and computational tool to study dynamic behavior in space and time to a critical component to model, design and fabricate actual devices that exploit the inherently nonlinear features of many natural phenomena. A common theme among researchers working in the field is the fundamental principle that makes nonlinear systems highly sensitive to perturbations when they occur near the onset of a bifurcation.

This behavior is universal among many nonlinear phenomena, in particular, among the sensory system of biological systems. If properly understood and manipulated, it can lead to significant enhancements in systems response and biologically inspired novel devices. Bridging the gap between theory and actual realizations of biologically inspired devices can only be accomplished by bringing together researchers working in theoretical methods in nonlinear science with those performing experimental works.

Since 2005, we have held a series of meetings to bring together researchers across various disciplines working on theory and experiments in nonlinear science with the overall aim of advancing the development and design of novel devices.

The first meeting was 2005 Device Applications of Nonlinear Dynamics (DANOLD) meeting, held in Catania, Italy. Then in 2007 ICAND, the research community met again in Poipu Beach, Koloa (Kauai), Hawaii, USA. More recently, the 2010 ICAND meeting was held in Alberta, Canada, at the luxurious Fairmont Chateau in Lake Louise. 2012 ICAND was held in Seattle, Washington, USA.

And 2016 in Denver, Colorado. The focus for 2016 ICAND was equally divided between theory and implementation of theoretical ideas into actual devices and systems.

The organizers extend their sincerest thanks to the principal sponsors of the meeting: Army Research Office (Washington, DC), Office of Naval Research (Washington, DC), Office of Naval Research-Global (Tokyo), San Diego State University (College of Sciences), and SPAWAR Systems Center Pacific. A special mention to Dr. Michael Shlesinger from the Office of Naval Research for his

support and insight to hold such a diverse meeting. We would also like to thank all the personnel who spent many hours making this meeting a success. Finally, we thank Springer for their production of the elegant proceedings.

San Diego, USA

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http://www.springer.com/978-3-319-52620-1

Proceedings of the 4th International Conference on Applications in Nonlinear Dynamics (ICAND 2016)

In, V.; Longhini, P.; Palacios, A. (Eds.)

2017, IX, 314 p. 146 illus., 102 illus. in color., Softcover
ISBN: 978-3-319-52620-1