Preface

The *First International Conference on Algebra, Topology and Topological Algebras* (ICATTA) was held at the city of Veracruz, Mexico, from January 5th to 7th, 2011.

The essential character of topological algebras is the simultaneous consideration of two structures on the same set. An algebraic structure (that of an algebra) and a topological structure, ensuring the consistency in between algebra and topology, leading as vital components, to an important object of Functional Analysis that we call topological algebras.

The study of (non-normed) topological algebras began around 1950, to manipulate certain classes of non-normed topological algebras that appeared naturally in mathematics and physics. Some results on such topological algebras had already been published earlier in 1947 by R. Arens. It was only in 1952 when R. Arens and E.A. Michael gave, independently, the first systematic study on locally m-convex algebras which constitute an important class of non-normed topological algebras. Here, one can stress the fact that M.A. Naimark, an expert in the area of Banach algebras, had remarked (in 1950) the importance of non-normed algebras and predicted the development of their theory. Concerning cosmology, G. Lassner, to his great surprise, realized that the theory of normed topological algebras was not enough to work with.

In addition to the study of the internal structure of non-normed and even non-locally convex topological algebras, there are applications to other branches of mathematics, such as differential geometry of smooth manifolds, and mathematical physics, for instance, quantum relativity (A. Mallios) and quantum cosmology (G. Lassner). Further, topological algebras aim to rule over unbounded operators. Other topics where topological algebras are applicable are topological homological algebra, topological algebraic geometry, sheaf theory and K-theory.

The main purpose of the meeting was to gather specialists in the fields of algebra, topology and topological algebras and to motivate them to interact in the fields involved.

Topics covered by the lecturers included Rings and Modules, Topological Rings, Multilinear Operators, Banach Algebras, m-convex Algebras, Function Algebras, C*-Algebras, Structure Theory in Topological Algebras, Topological Groups, Symmetric Spaces and related topics.

This volume contains talks presented at the conference, as well as papers received in response to a call for papers; some of them are expository and provide new insights, while others contain new research. Most of them are addressed to mathematicians working in areas on Algebra, Topology and Topological Algebras.

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We hope this will be the beginning of a long sequence of conferences where researchers of Algebra, Topology and Topological Algebras find a place to interact and discuss about the trends on mathematics in these fields.

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