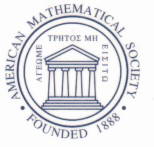
CONTEMPORARY MATHEMATICS

427

Topological Algebras and Applications

Fifth International Conference
on Topological Algebras and Applications
June 27–July 1, 2005
Athens, Greece

Anastasios Mallios
Marina Haralampidou
Editors



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American Mathematical Society
Providence, Rhode Island

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The Editors regretfully announce the loss of a dear friend and distinguished colleague, Professor Gerd Lassner (1940–2005), who passed away on September 24, 2005 [see p. 253].

Contents

Preface xi

List of Participants xiii

Conference Lectures xvii

Topologisation et multiplication dans certaines algèbres
Z. ABDELALI and M. CHIDAMI 1

On Serre-Swan-Mallios theorem
MART ABEL 7

Topological algebras with idempotently pseudoconvex von Neumann bornology
MATI ABEL 15

Hyers-Ulam-Rassias stability of derivations on Hilbert C^*-modules
MARYAM AMYARI and MOHAMMAD SAL MOSLEHIAN 31

On extensions of Stone-Weierstrass theorem
JORMA ARHIPPAINEN 41

On Q_t-algebras
HUGO ARIZMENDI, ANGEL CARRILLO, and LOURDES PALACIOS 49

Some results on the algebraic approach to quantum dynamics
FABIO BAGARELLO 57

Topological algebras and differential structures in C^*-algebras
SUBHASH J. BHATT 67

On C^*-spectrality of locally convex *-algebras in C^*-algebras
S. J. BHATT, A. INOUE, and H. OGI 89

Ptàk function, positive elements and the positive cone of a unital LC *-algebra
DIMITRIOS G. BIRBAS 97

Topologizable operators on locally convex spaces
JOSÉ BONET 103

On locally convex H^*-triple systems
A. J. CALDERÓN MARTÍN and MARINA HARALAMPIDOU 109

Harmonic functional calculus in m-p-complete A-p-normed algebras
M. CHAHBOUN 125

A concept of finiteness in topological algebras
RACHID CHOUKRI 131

Square roots of strongly positive elements in lmc algebras
THANASSIS CHRYSSAKIS 139

Harmonic functions operating on contractions in m-convex algebras
A. EL KINANI 143

Some characterizations using cone notions in m-convex algebras
A. EL KINANI, M. A. NEJJARI, and M. OUDADESS 151

On the completion of a C^*-normed algebra under a locally convex algebra topology
M. FRAGOULOPOULOU, A. INOUE, and K.-D. KÜRSTEN 155

On Šilov's idempotent theorem
RODIA I. HADJIGEORGIOU 167

On generalized Ambrose algebras
MARINA HARALAMPIDOU 181

Tensor products in quantum functional analysis: the non-matricial approach
A. YA. HELEMSKII 199

Unbounded conditional expectations for O*-algebras
ATSUSHI INOUE, M. TAKAKURA, and H. OGI 225

A Radon-Nikodym theorem for completely multi-positive linear maps and its applications
MARIA JOIŢA 235

Commutativity criteria for Gelfand-Mazur algebras
ARNE KOKK 247

Topological algebras and quantum cosmology [the Abstract]
GERD LASSNER 253

Representation of extensions, of $\mathbb{C}$, endowed with a discrete absolute value
A. LAZRAQ KHLASS and M. OUDADESS 255

Another proof of the Shirali-Ford theorem
MICHAEL LEINERT 259

On algebra spaces
ANASTASIOS MALLIOS 263

On combinatorially regular topological algebras
ANASTASIOS MALLIOS and ALI OUKHOUYA 285

Topological algebras with continuous characters
ABDELHAK NAJMI 291

Spectral decomposition and duality in commutative locally C^*-algebras
GEORGE F. NASSOPOULOS 303

Locally A-convex algebras revisited
L. OUBBI 319

On different versions of Vidav-Palmer theorem
MOHAMED OUDADESS 331

On combinatorially regular Fréchet algebra
ALI OUKHOUYA 339

Description of closed maximal one-sided ideals in several classes of real Gelfand-Mazur algebras
OLGA PANOVA 345

Strictly flat cyclic Fréchet modules and approximate identities
A. YU. PIRKOVSKII 359

Homologically trivial Fréchet algebras
ALEXEI YU. PIRKOVSKII and YURII V. SELIVANOV 367

On strictly flat Fréchet modules
CHRISTINA P. PODARA 389

Uniform algebra isomorphisms and peripheral spectra
N. V. RAO, T. V. TONEV, and E. T. TONEVA 401

Bounded and strongly bounded elements in Banach quasi *-algebras
CAMILLO TRAPANI 417

On dual coordinate systems
YANNIS TSERTOS 425

Operator algebras on locally convex spaces
WIESLAW ŻELAZKO 431

Preface

This volume contains the proceedings of the *Fifth International Conference on Topological Algebras and Applications* (ICTAA), which was held at the University of Athens, Greece, from June 27 to July 1, 2005. In recent years the theory of (non-normed) *Topological Algebras* has grown up, becoming an important and ongoing subject of mathematical research with numerous applications (vindicating thus Naimark's prediction, in the late forties (!)); this appears not only in pure mathematics (Real and Complex Analysis, Differential Geometry, K-Theory), but also in physics (Quantum Field Theory, Quantum Cosmology). The purpose of the conference was to reveal recent developments in Topological Algebra Theory, along with potential interactions of the same with the aforesaid areas.

The number of registered participants was, to our pleasure, more than expected. Colleagues from 19 countries around the world had the opportunity to meet together, exchange ideas, and discuss new research trends. Their presence contributed to the success of the conference and we are very pleased to express our thanks to all of them. During the conference young mathematicians along with postgraduate students had the chance to get acquainted with the theory of topological algebras. The topics discussed ranged a broad area of subjects, including general theory of topological algebras, ideals, subalgebras, structure and classification of topological algebras, topological algebras with involution and their representations, functional calculus in topological algebras, commutative topological algebras, topological algebras of (unbounded) operators, applications of self-adjoint operators to physics, (topological algebra-)homological methods, triple systems, applications of locally C^*-algebras, etc. This volume contains qualified refereed papers, either presented at or solicited for the meeting. Among them are excellent expository articles as well as research papers containing significant new results on topological algebras. Some of them with potential applications to Mathematical Physics. Overall, there were 11 one-hour lectures and 42 half-hour lectures. This volume also includes an abstract submitted to the Editors by Gerd Lassner, who became suddenly ill in the period around the conference.

This ICTAA is the fifth in a series of meetings on this same subject. The proceedings of the first three conferences on Topological Algebras and Applications have been published by the host universities: *Mathematical Studies 1*, Estonian Mathematical Society, Tartu (Estonia), 2001; *Publications of the École Normale Supérieure*, Rabat (Maroc), 2004; *Acta Universitatis Ouluensis A Scientiae Rerum Naturalium* , A 408, Oulu (Finland), 2004. The Proceedings of the fourth ICTAA, in Oaxaca (Mexico), have been published by the American Mathematical Society in the *Contemporary Mathematics* series, vol. 341, 2004.

All the activities, scientific or social, as well as other information can be found on the conference website at **http://www.math.uoa.gr/ictaa2005/**

We wanted to thank the members of the Organizing Committee, as well as those of the Scientific Committee for their assistance and support. We also want to take this opportunity to thank the sponsors for kindly funding this conference: *University of Athens, Ministry of Education, Ministry of Cultural Affairs, Municipality of Piraeus-DEPAP, MP and Associates and EOT (Hellenic Tourism Organization).*

We would also like to thank all the participants, the speakers, the authors of contributed papers, and the referees for the time they spent in carefully reading and selecting the papers appeared here. We are also much indebted to Mathematics Department of the University of Athens for hosting this conference.

The Editors are grateful to the Editorial Board and especially to Professor Dennis DeTurck, Managing Editor of the Contemporary Mathematics, for accepting this volume to appear in the Contemporary Mathematics series. Our cordial thanks go also to Ms. Christine Thivierge for her support in coordinating these proceedings and to Sam White for his competent editing work. In closing, we would like to express our heartfelt thanks to a number of individuals who made the conference and this volume possible, as well as to our graduate students, Evgenios Kakariadis, Ioannis Tsakanikas, Charalambos Tsiatouchas, Ioannis Zarakas and Petros Valletas (undergraduate), for their valuable assistance during the meeting.

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Conference Lectures

Topologisation et multiplication dans certain algèbres
Zine El Abidine Abdelali

From finitely generated projective modules to the generalization of Serre-Swan-Mallios theorem
Mart Abel

Topological algebras with pseudoconvex von Neumann bornology
Mati Abel

On stability of homomorphisms on Banach algebras
Maryam Amyari

On extensions of Stone-Weirstrass theorem
Jorma Arhippainen

On the topological invertible elements of a topological algebra
Hugo Arizmendi

Derivations of quasi *-algebras and their physical applications
Fabio Bagarello

Topological algebras and differential structure in C^*-algebras
Subhashbhai Bhatt

The set of positive elements and the positive cone of a unital lmc *-algebra
Dimitrios Birbas

Canonical algebras of projections on Köthe function and sequence spaces
José Bonet

On locally convex H^*-triple systems
Antonio Calderón Martin* and Marina Haralampidou

Calcul harmonique dans les algèbres A-p-normées m-p-complètes
Miloud Chahboun

Une notion de finitude dans les algèbres topologiques
Rachid Choukri

Existence of locally C^*-subalgebras in involutive lmc algebras
Thanassis Chryssakis

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*speaker

Algèbres de Banach unitaires et semisimplicité
Kaidi El Amine

Harmonic functions of contractions in $m-$convex algebras
Abdellah El Kinani

C^*-seminorms with good behaviour
Maria Fragoulopoulou

Fréchet algebras with spectral invariance in the microlocal analysis
Bernhard Gramsch

On Šilov's idempotent theorem
Rodia Hadjigeorgiou

On generalized Ambrose algebras
Marina Haralampidou

Some questions of quantum functional analysis approached without matrices
Alexander Ya. Helemskii

Opérateurs déterminant la topologie d'une norme complète
El Hossein Illoussamen

The completion of a C^*-normed algebra in a locally convex algebra topology
Atsushi Inoue

Non commutative uniform algebras
Krzysztof Jarosz

A Radon-Nikodym theorem for completely multi-positive linear maps and its applications
Maria Joiţa

Lipschitz functions on Hermitian Banach $^*-$algebras
Edward Kissin

Représentation des sur-corps de C à valeur absolue discrète
Aicha Lazraq Khlass

Another proof of the Shirali and Ford theorem
Michael Leinert

On cyclic-type homology of topological algebras
Zinaida Lykova

Homomorphisms and composition operators on algebras of analytic functions
Manuel Maestre

Classification of C^*-algebra extensions via asymptotic homomorphisms
Vladimir M. Manuilov

Algèbres topologiques à caractères continus et algèbres topologiques presque commutatives
Abdelhak Najmi

Some characterizations due to cones in $m-$convex algebras
Mohamed Amine Nejjari

Spectrality of locally convex $^*-$algebras
Hidekazu Ogi

Locally $A-$convex algebras revisited
Lahbib Oubbi

On different versions of Vidav-Palmer theorem
Mohamed Oudadess

Sur les algèbres topologique locales
Ali Oukhouya

On Q_t, Q_M and $Q_M^{\#}-$algebras
Lourdes Palacios

Real Gelfand-Mazur algebras
Olga Panova

Strictly flat cyclic Fréchet modules and approximate identities
Alexei Yu. Pirkovskii

Construction of strictly flat Fréchet modules in terms of bounded approximate identities
Christina Podara

Hyers-Ulam-Rassias stability of derivations
Mohammad Sal Moslehian* and Freydoon Rahbarnia

Homologically trivial topological algebras
Yurii V. Selivanov

Invertibility in tensor products of Q-algebras
Pablo Sevilla-Perris* and Sean Dineen

Getting numbers into and back from locally convex topology. Part 1: (Weak) locally convex approach structures
Mark Sioen

Formulas for the joint spectral radius in locally convex algebras
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Reviving a theorem of Erret Bishop
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Conditional expectations for unbounded operator algebras
Mayumi Takakura*, Atshushi Inoue, and Hidekazu Ogi

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Thomas Tonev* and Elena Toneva

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Camillo Trapani

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Vesko Valov*, A. Chigogidze, A. Karasev, and K. Kawamura

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Operator algebras on locally convex spaces
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The Fifth International Conference on Topological Algebras and Applications was held in Athens, Greece, from June 27th to July 1st of 2005. The main topic of the Conference was general theory of topological algebras and its various applications, with emphasis on the "non-normed" case. 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, such as quantum relativity and quantum cosmology. Operator theory of unbounded operators and related non-normed topological algebras are intensively studied here. Other topics presented in this volume are topological homological algebra, topological algebraic geometry, sheaf theory and L-theory.

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