

# **Recent Advances in Operator Theory**

**The Israel Gohberg Anniversary Volume**

**International Workshop in Groningen, June 1998**

**A. Dijksma  
M.A. Kaashoek  
A.C.M. Ran  
Editors**

**Springer Basel AG**

Editors:

A. Dijksma  
Department of Mathematics  
University of Groningen  
P.O. Box 800  
9700 AV Groningen  
The Netherlands  
e-mail: A.Dijksma@math.rug.nl

M.A. Kaashoek  
Division of Mathematics and Computer Science  
Faculty of Sciences  
Vrije Universiteit  
De Boelelaan 1081a  
1081 HV Amsterdam  
The Netherlands  
e-mail: kaash@cs.vu.nl

A.C.M. Ran  
Division of Mathematics and Computer Science  
Faculty of Sciences  
Vrije Universiteit  
De Boelelaan 1081a  
1081 HV Amsterdam  
The Netherlands  
e-mail: ran@cs.vu.nl

2000 Mathematics Subject Classification 47-06; 46, 45, 30, 34, 35, 93

A CIP catalogue record for this book is available from the  
Library of Congress, Washington D.C., USA

Deutsche Bibliothek Cataloging-in-Publication Data

Recent advances in operator theory : the Israel Gohberg anniversary volume ;  
international workshop in Groningen, June 1998 / A. Dijksma ... ed.. - Basel ; Boston ;  
Berlin : Birkhäuser, 2001  
(Operator theory ; Vol. 124)  
ISBN 978-3-0348-9516-3 ISBN 978-3-0348-8323-8 (eBook)  
DOI 10.1007/978-3-0348-8323-8

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned,  
specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms  
or in other ways, and storage in data banks. For any kind of use permission of the copyright owner must be obtained.

© 2001 Springer Basel AG  
Originally published by Birkhäuser Verlag, Basel - Boston - Berlin in 2001  
Softcover reprint of the hardcover 1st edition 2001

Printed on acid-free paper produced from chlorine-free pulp. TCF ∞

Cover design: Heinz Hiltbrunner, Basel

ISBN 978-3-0348-9516-3

9 8 7 6 5 4 3 2 1

[www.birkhauser-science.com](http://www.birkhauser-science.com)

# Contents

Picture of Israel Gohberg .....	v
Editorial preface .....	xi
Speeches given at the conference dinner in celebration of Israel Gohberg's 70-th anniversary .....	xiii
Curriculum vitae of Israel Gohberg .....	xxiii
Rien Kaashoek	
<i>A review of the mathematical work of Israel Gohberg</i> .....	xxvii
List of publications of Israel Gohberg .....	xxxiii
Vadim Adamyan, Reinhard Mennicken and Vjacheslav Pivovarchik	
<b>On the spectral theory of degenerate quadratic operator pencils</b> .....	1
Daniel Alpay, Vladimir Bolotnikov and Leiba Rodman	
<b>Two-sided tangential interpolation for Hilbert-Schmidt operator functions on polydisks</b> .....	21
D. Alpay, A. Dijksma and Y. Peretz	
<b>Nonstationary analogs of the Herglotz representation theorem: realizations centered at an arbitrary point</b> .....	63
Yury Arlinskii	
<b>Characteristic functions of maximal sectorial operators</b> .....	89
T.Ya. Azizov, A.I. Barsukov, A. Dijksma and P. Jonas	
<b>Similarity between Krein space bicontractions and Hilbert space contractions</b> .....	109
Hari Bercovici and Thomas Smotzer	
<b>Classification of cyclic invariant subspaces of Jordan operators</b> .....	131
Paul Binding and Rostyslav Hrynniv	
<b>Elliptic spectral problems of higher order with eigenparameter dependent boundary conditions</b> .....	145

V.B. Bogevolnov, A.B. Mikhalkova, B.S. Pavlov and A.M. Yafyasov <b>About scattering on the ring</b> .....	155
Ramon Bruzual and Marisela Domínguez <b>Dilation of generalized Toeplitz kernels on lexicographic <math>\Gamma \times \mathbf{R}</math></b> .....	175
Harry Dym <b>On Riccati equations and reproducing kernel spaces</b> .....	189
Torsten Ehrhardt <b>A status report on the asymptotic behavior of Toeplitz determinants with Fisher–Hartwig singularities</b> .....	217
Volker Hardt and Reinhard Mennicken <b>On the spectrum of unbounded off-diagonal <math>2 \times 2</math> operator matrices in Banach spaces</b> .....	243
J. Janas and S. Naboko <b>Multithreshold spectral phase transitions for a class of Jacobi matrices</b> .....	267
M.A. Kaashoek and H.J. Woerdeman <b>Positive extensions and diagonally connected patterns</b> .....	287
Eizaburo Kamei <b>Parametrized Furuta inequality and its applications</b> .....	307
I. Karelin L. Lerer and A.C.M. Ran <b><math>J</math>-symmetric factorizations and algebraic Riccati equations</b> .....	319
A.G. Kostenko and A.A. Shkalikov <b>Scattering of waves by periodic gratings and factorization problems</b> ..	361
Heinz Langer, Alexander Markus and Christiane Tretter <b>Corner of numerical ranges</b> .....	385
M.M. Malamud <b>On some classes of extensions of sectorial operators and dual pairs of contractions</b> .....	401
S.A.M. Marcantognini and M.D. Morán <b>Liftings of intertwining operators</b> .....	451
Alexander Markus and Vladimir Matsaev <b>Some estimates for the resolvent and for the lengths of Jordan chains of an analytic operator function</b> .....	473

David Ogle, Nicholas Young	
<b>The Parrott problem for singular values</b>	<b>481</b>
B. de Pagter, F.A. Sukochev and H. Witvliet	
<b>Unconditional decompositions and Schur-type multipliers</b>	<b>505</b>
Vyacheslav Pivovarchik	
<b>Scattering in a loop-shaped waveguide</b>	<b>527</b>
Steffen Roch	
<b>Pseudospectra of operator polynomials</b>	<b>545</b>