

# GEORGIAN MATHEMATICAL JOURNAL

## EDITOR-IN-CHIEF

Ivan Kiguradze, *Tbilisi*

## EXECUTIVE EDITOR

Tengiz Shervashidze, *Tbilisi*

## EDITORIAL SECRETARY

Maia Kvinikadze, *Tbilisi*

## EDITORIAL BOARD

Hans-Joachim Baues, *Bonn*

Nodar Berikashvili, *Tbilisi*

Oleg V. Besov, *Moscow*

Bogdan Bojarski, *Warsaw*

Roland Duduchava, *Tbilisi*

Hans-Jürgen Engelbert, *Jena*

Revaz Gamkrelidze, *Moscow*

Joseph Gubeladze, *San Francisco*

Hvedri Inassaridze, *Tbilisi*

Mamuka Jibladze, *Tbilisi*

Tornike Kadeishvili, *Tbilisi*

Otto H. Kegel, *Freiburg*

Alexander Kharazishvili, *Tbilisi*

Sergo Kharibegashvili, *Tbilisi*

Estate Khmaladze, *Wellington*

Tariel Kiguradze, *Melbourne*

Vakhtang Kokilashvili, *Tbilisi*

Samuel Krushkal, *Ramat Gan*

Jaroslav Kurzweil, *Prague*

Stanislaw Kwapien, *Warsaw*

Hans Rudolf Lerche, *Freiburg*

Jean Mawhin, *Louvain-la-Neuve*

Paolo Emilio Ricci, *Rome*

Vaja Tarieladze, *Tbilisi*

Hans Triebel, *Jena*

Nicholas Vakhania, *Tbilisi*

Fabio Zanolin, *Udine*

**DE GRUYTER**

**GEORGIAN MATHEMATICAL JOURNAL** publishes research articles of best scientific standard in pure and applied mathematics. Special emphasis is put on the presentation of results obtained by Georgian mathematicians.

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at [www.degruyter.com/gmj](http://www.degruyter.com/gmj).

**ABSTRACTED/INDEXED IN** Celdes • CNKI Scholar (China National Knowledge Infrastructure) • CNPIEC • EBSCO Discovery Service • Elsevier: SCOPUS • Google Scholar • J-Gate • Mathematical Reviews (MathSciNet) • Naviga (Softweco) • Primo Central (ExLibris) • SCImago (SJR) • Summon (Serials Solutions/ProQuest) • TDOne (TDNet) • Thomson Reuters: Journal Citation Reports/Science Edition; Science Citation Index Expanded • WorldCat (OCLC) • Zentralblatt Math.

ISSN 1072-947X · e-ISSN 1572-9176 · CODEN GMJOE5

**RESPONSIBLE EDITOR** Tengiz Shervashidze, A. Razmadze Mathematical Institute of I. Javakhishvili Tbilisi State University, M. Tamarashvili Str. 6, 0177 Tbilisi, Georgia.

Email: [gmj@rmi.ge](mailto:gmj@rmi.ge)

**JOURNAL MANAGER** Katharina Kaupen, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany.

Tel.: +49 (0)30 260 05-385, Fax: +49 (0)30 260 05-250

Email: [katharina.kaupen@degruyter.com](mailto:katharina.kaupen@degruyter.com)

**RESPONSIBLE FOR ADVERTISEMENTS** Panagiota Herbrand, De Gruyter, Rosenheimer Straße 143, 81671 München, Germany.

Tel.: +49 (0)89 769 02-394, Fax: +49 (0)89 769 02-350

Email: [panagiota.herbrand@degruyter.com](mailto:panagiota.herbrand@degruyter.com)

© 2014 Walter de Gruyter GmbH, Berlin/Boston

**TYPESETTING** Dimler & Albroscheit, Müncheberg

**PRINTING** Franz X. Stückle Druck und Verlag e.K., Ettenheim

Printed in Germany



## Contents

Jamshaid Ahmad, Muhammad Arshad, Pasquale Vetro  
**Coupled coincidence point results for  $(\phi, \psi)$ -contractive mappings in partially ordered metric spaces — 113**

Youssèf Ben Cheikh, Mohamed Gaied, Ali Zaghouani  
 **$q$ -Dunkl-classical  $q$ -Hermite type polynomials — 125**

Tawfik Benchikh  
**Spectral representation of a Banach-valued stationary random function on a locally compact abelian group — 139**

Yanping Chen, Han Han  
**Sharp weighted norm inequalities for the commutator of Littlewood–Paley operators — 147**

Sergei Chobanyan, George Giorgobiani, Vakhtang Kvaratskhelia, Shlomo Levental, Vaja Tarieladze  
**On rearrangement theorems in Banach spaces — 157**

Avtandil Gachechiladze, Roland Gachechiladze, David Natroshvili  
**Dynamical contact problems with friction for hemitropic elastic solids — 165**

Shapour Heidarkhani, Johnny Henderson  
**Multiple solutions for a Dirichlet quasilinear system containing a parameter — 187**

Arezki Kheloufi  
**Parabolic equations with Cauchy–Dirichlet boundary conditions in a non-regular domain of  $\mathbb{R}^{N+1}$  — 199**

Ivan Kiguradze  
**A priori estimates of solutions of nonlinear boundary value problems for singular in a phase variable second order differential inequalities — 211**

Reiner Kühnau  
**Transformation of the quasiconformal reflection coefficient and of the Fredholm eigenvalue — 225**

Ahmed Salem  
**Expansions and asymptotics associated with basic hypergeometric functions and modified  $q$ -Bessel functions — 233**

