

EDITORIAL

FCAA NEWS, RELATED MEETINGS AND BOOKS

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Dear readers,

in the Editorial Notes we announce some important news for our journal, information and reviews on new books and international meetings in the FCAA (Fractional Calculus and Applied Analysis) areas, etc.

1. News About Indexing of FCAA Journal

As we have been informed recently by Stephen Soehlen, Senior Editor Physical and Natural Sciences at Springer, Wien - New York, the journal "Fractional Calculus and Applied Analysis" has been accepted by *Thomson ISI* for listing. It will receive its first Impact Factor in 2013.

Indeed, one can find now FCAA as included in Thomson's Master Journal List, <http://ip-science.thomsonreuters.com/mjl/>, see <http://ip-science.thomsonreuters.com/cgi-bin/jrnlst/jlresults.cgi?PC=MASTER&ISSN=1311-0454>, and indexed in ISI Science Citation Index Expanded (SCI-E, Thomson Reuters): http://thomsonreuters.com/products_services/science/science_products/a-z/science_citation_index_expanded/, also in Current Contents - Physical, Chemical & Earth Sciences, with 37 out of the 37 articles published in Volume 14 for 2011.



Earlier, it was accepted also for indexing in *Scopus*, since the beginning of 2011, and has already 36 articles found as published in Volume 14, 2011.

Since earlier years, the journal is also regularly indexed / reviewed in many other *World databases*, as: Math. Reviews / MathSciNet; Zentralblatt für Math.; British Library Direct; DML (Digital Mathematics Library); Electronic Journals Library University Library of Regensburg; OATAO (Open Archive Toulouse Archive Ouverte); Neiman Library of Exact Sciences and Engineering (Tel-Aviv University); Google Scholar, etc.

2. Forthcoming Meetings Related to FCAA Topics:

FDA'13, The 6th IFAC Workshop on Fractional Differentiation and Its Applications Grenoble, France, February 4-6, 2013

This workshop will be held in frames of the SSSC joint conferences, as its Track D: Fractional Differentiation and Its Applications, with topics as: Analysis tools, biomedical engineering, fractional earth science, fractional filters, fractional order modeling and control, fractional transforms and their applications, filtering, image processing, mechanics, observation, wavelet applications, electrochemistry, thermal systems, economy, mathematics, etc.

Important dates: – Invited session submission: June 1, 2012; – Regular Paper Submission: June 15, 2012; – Notification of acceptance: September 15, 2012; – Final Paper Submission: November 1, 2012.

Call for papers, download at

http://www.gipsa-lab.fr/SSSC2013/dld/CFP_IFAC2013.pdf

Conference Flyer:

http://www.gipsa-lab.fr/SSSC2013/dld/IFAC_SSC_2013_FLYER.pdf

For more information, follow the conference web site:

<http://www.gipsa-lab.fr/SSSC2013/>

As for all IFAC events, all the papers will be peer-reviewed. The reviews will be done on a 6 pages draft (full paper, no abstract). Invited sessions within the technical scope of the conference are also solicited.

Note that this event breaks the two years periodicity of the FDA workshops FDA' 2004, FDA' 2006, FDA' 10, FDA' 12: see history at <http://em.hhu.edu.cn/fda12/About.html> and <http://em.hhu.edu.cn/fda12/>, but the 2 years periodicity should be restored in 2014 with a next FDA workshop, probably in Italy. A decision should be made in May in China, during FDA'12. In 2016, the FDA workshop will be organized in the joint conferences SSSC as in 2013 and in 2018, there is also a standing proposal by our colleague.

Reported by J. Sabatier (Co-Chair FDA) and J. Tenreiro Machado (Co-Chair FDA), Editors at FCAA.

3. Newsletter: FDA Express (Fractional Derivative & Applications Express)

About FDA Express, at <http://em.hhu.edu.cn/fda/index.htm>

The FDA Express is a *biweekly newsletter* centering on fractional derivative and its applications and involving fractals and power law phenomena. And it is sent to your registered email address on 15th and 30th of each month. The various topics include: open issues and discussions, recent advances, contents and links to journals related to FDA topics, new books, conferences, researchers & groups, emphasize on selected classical and survey papers (including at arXiv, etc), opening jobs, and so on.

You are welcome to subscribe this newsletter by simply clicking at <http://em.hhu.edu.cn/fda/subscription.htm>. We also invite you to contribute news and digests in the scope of the FDA, by e-mail: fdaexpress@hhu.edu.cn. Your active participation and contribution will help growing of our community in a great way.

This Express is currently maintained by the volunteers from the Institute of Soft Matter Mechanics, Hohai University, Nanjing, P.R. China.

Currently available, at <http://em.hhu.edu.cn/fda/index.htm>, are the following FDA Express issues: Vol.1, No.1 (Dec. 15, 2011), Vol.1, No.2 (Dec. 30, 2011), Vol.2, No.1 (Jan. 15, 2012), Vol.2, No.2 (Jan. 30, 2012), Vol.2, No.3 (Feb. 15, 2012), Vol.2 No.4 (Feb. 29, 2012).

Editor: Wen Chen

Associate Editor: Hongguang Sun; Members: Xiaodi Zhang, Shuai Hu; Technical Support: Lin Chen. If any inquiry or suggestion, please contact us by e-mail: fdaexpress@hhu.edu.cn.

4. Information and Reviews on Recent Books Related to FCAA Topics

Dumitru Baleanu, Kai Diethelm, Enrico Scalas, Juan J Trujillo, *FRACTIONAL CALCULUS. Models and Numerical Methods*, World Scientific Publ. Co., N. Jersey, London, Singapore etc., 2012, 428 pp.

<http://www.worldscibooks.com/mathematics/8180.html>.

Series on Complexity, Nonlinearity and Chaos - Vol. 3; ISBN: 978-981-4355-20-9, 981-4355-20-8 (USD 130 / GBP 85; ISBN: 978-981-4355-21-6(ebook), 981-4355-21-6(ebook) (USD 169 / BGP 112).

About this book:

The subject of fractional calculus and its applications (that is, convolution-type pseudo-differential operators including integrals and derivatives of any arbitrary real or complex order) has gained considerable popularity and importance during the past three decades or so, mainly due to its applications in diverse fields of science and engineering. These operators have been used to model problems with anomalous dynamics, however, they also are an effective tool as filters and controllers, and they can be applied to write complicated functions in terms of fractional integrals or derivatives of elementary functions, and so on.

This book gives readers the possibility of finding very important mathematical tools for working with fractional models and solving fractional differential equations, such as a generalization of Stirling numbers in the framework of fractional calculus and a set of efficient numerical methods. Moreover, the authors introduce some applied topics, in particular fractional variational methods which are used in physics, engineering or economics. They also discuss the relationship between semi-Markov continuous-time random walks (CTRW) and the space-time fractional diffusion equation, which generalizes the usual theory relating random walks to the diffusion equation. These methods can be applied in finance, to model tick-by-tick (log)-price fluctuations, in insurance theory, to study ruin, as well as in macroeconomics as prototypical growth models.

All these topics touched here are complementary to what is dealt with in other existing books on fractional calculus and its applications. This book was written with a trade-off in mind between full mathematical rigor and the needs of readers coming from different applied areas of science and engineering. In particular, the numerical methods listed in the book are presented in a readily accessible way that immediately allows the readers to implement them on a computer in a programming language of their choice. Numerical codes are also provided.

Table of Contents: * Preface; * Preliminaries; * A Survey of Numerical Methods for the Solution of Ordinary and Partial Fractional Differential Equations; * Efficient Numerical Methods; * Generalized Stirling Numbers and Applications; * Fractional Variational Principles; * CTRW and Fractional Diffusion Models; * Applications of CTRW to Finance and Economics; * Appendix A (Source Codes).

Readership: Undergraduate and graduate students, researchers and professionals in applied mathematics, analysis & differential equations and probability & statistics.

H. M. Srivastava, Junesang Choi, *Zeta and q -Zeta Functions and Associated Series and Integrals*, Elsevier, Amsterdam, London and New York, 2012, 261 pp.

ISBN: 978-0-12-385218-2 (USD 150.00)

<http://www.elsevierdirect.com/ISBN/9780123852182/>

Zeta-and-qZeta-Functions-and-Associated-Series-and-Integrals

E-Book: <http://www.sciencedirect.com/science/book/9780123852182>

About the book:

This book is essentially a thoroughly revised, enlarged and updated version of the authors' work: *Series Associated with the Zeta and Related Functions* (Kluwer Academic Publishers, Dordrecht, Boston and London, 2001). The main authors' objective is to present a state-of-the-art account of the theories and applications of the various methods and techniques which are used in dealing with many different families of series associated with the Riemann Zeta function and its numerous generalizations and basic (or q -) extensions. Systematic accounts of only some of these methods and techniques, which are widely scattered in journal articles and book chapters, were included in the above-mentioned book.

In recent years, there has been an increasing interest in problems involving closed-form evaluations of (and representations of the Riemann Zeta function at positive integer arguments as) various families of series associated with the Riemann Zeta function $\zeta(s)$, the Hurwitz Zeta function $\zeta(s, a)$, and their such extensions and generalizations as (for example) Lerch's transcendent (or the Hurwitz-Lerch Zeta function) $\Phi(z, s, a)$. Some of these developments have apparently stemmed from an over two-century-old theorem of Christian Goldbach (1690–1764), which was stated in a letter dated 1729 from Goldbach to Daniel Bernoulli (1700–1782), from recent rediscoveries of a fairly rapidly convergent series representation for $\zeta(3)$, which is actually contained in a 1772 paper by Leonhard Euler (1707–1783), and from another known series representation for $\zeta(3)$, which was used by Roger Apéry (1916–1994) in 1978 in his celebrated proof of the irrationality of $\zeta(3)$.

This revised, enlarged and updated version of our 2001 book is motivated essentially by the fact that the theories and applications of the various methods and techniques used in dealing with many different families of series associated with the Riemann Zeta function, its aforementioned relatives and its many different basic (or q -) extensions are to be found so far only in widely scattered journal articles published during the last decade or so. Thus our systematic (and unified) presentation of these results on the evaluation and representation of the various families of Zeta and q -Zeta

functions is expected to fill a conspicuous gap in the existing books dealing exclusively with these Zeta and q -Zeta functions.

Table of Contents: Ch. 1. Introduction and Preliminaries; Ch. 2. The Zeta and Related Functions; Ch. 3. Series Involving Zeta Functions; Ch. 4. Evaluations and Series Representations; Ch. 5. Determinants of the Laplacians; Ch. 6. q -Extensions of some special functions and polynomials; Ch. 7. Miscellaneous Results; Bibliography.

Readership: This book is written primarily as a reference work for various seemingly diverse groups of research workers and other users of series associated with the Zeta and related functions. In particular, teachers, researchers and postgraduate students in the fields of mathematical and applied sciences will find this book to be especially useful, not only for its detailed and systematic presentations of the theory and applications of the various methods and techniques used in dealing with many different classes of series associated with the Zeta and related functions, or for its stimulating historical accounts of a large number of problems considered here, but also for its well-classified tables of series (and integrals) and its well-motivated presentation of many sets of closely related problems with their precise bibliographical references (if any).

Richard Herrmann, *Fractional Calculus: An Introduction for Physicists*, World Scientific Publ. Co., Hackensack, NJ, 2011, 261 pp., ISBN 9789814340243, ISBN-10: 9814340243

Some information details on this book have been provided in Editorial Note of the previous issue Vol. 15, No 1,

<http://www.springerlink.com/content/1311-0454/15/1/>.

For Contents, Ordering Details, etc. see at

http://www.google.bg/books?hl=bg&lr=&id=mPXzp1f7ycMC&oi=fnd&pg=PR5&dq=%22R.+Herrmann%22%2B%22Fractional+Calculus:+An+Introduction+for+Physicists%22&ots=Bnr-1faE-Z&sig=Anvqfm052rAQQRppTFaZUgg7UgU&redir_esc=y#v=onepage&q&f=false

Here we bring your attention to a *review on this book, written by Ralf Metzler*, that appeared recently in: *Physics Today*, Vol. 65, Issue 2 (Feb. 2012), page 55. One can find it at: http://www.physicstoday.org/resource/1/phtoad/v65/i2/p55_s1?bypassSSO=1

"... There exists a rich selection of mathematical texts on fractional calculus (FC), starting with the 1974 classic by Keith Oldham and Jerome Spanier. The literature on FC applications in the physical sciences is following suit, with a number of recent additions. Several recent books ... have

been devoted to the topic, written or edited by such experts as Rudolf Hilfer, Joseph Klafter, Francesco Mainardi, Vladimir Uchaikin, and me. The focus in most of those works is on statistical processes. In that context, the occurrence of fractional derivatives with respect to space or time is directly related to continuous-time, random-walk processes with long-tailed jump-length or waiting-time distributions or, equivalently, to coupled Langevin equations mirroring the probabilistic concept of subordination to a counting process. . . . In “Fractional Calculus: An Introduction for Physicists”, R. Herrmann advocates for the potential application of FC to a number of areas in the physical sciences. The book is a solid introduction to FC that contains, in particular, an elucidating section on the geometric interpretation of fractional operators. Contrary to its own blurb, the bulk of the book concentrates on aspects of fractional calculus related to symmetries in quantum mechanics. Curiously, the author neglects the statistical mechanics and stochastic processes, the fields in which FC methods have seen significant applications. However, what is covered is presented in an authoritative, solid style and actually provides very entertaining reading. The author takes the reader on a journey to explore several quantum mechanical contexts to follow up on the question, What changes to the standard symmetries are effected by the introduction of fractional operators? Thus one learns about the role of parity in fractional wave equations with respect to space, how a fractional Schrödinger equation can be formulated, and the general implications of fractional spin. The author sets the scene for nuclear- and particle-physics applications, including spectra, and for nuclear magic numbers, with an in-depth introduction of the fractional rotation group. He then discusses fractional fields and their gauge invariance in the context of a fractional calculus for tensor quantities. FC discusses many fascinating consequences of fractional formulations and opens up new vistas for the now conventional symmetries used in quantum and particle physics. As the author mentions, “This book is explicitly devoted to the practical consequences of using fractional calculus”. However, the downside is that the book does not provide the motivation for any particular formulation. The discussed equations, for instance, are not derived as diffusion limits of random walks or from subordination arguments based on well-studied theories. More like a mathematician, Herrmann analyzes the extended equations for their properties. That ad hoc introduction of fractional operators may be appealing to casual readers, but the books axiomatic format makes it less suitable as a text for a graduate course. Overall, this book is an affordable and valuable introduction to the field that will appeal to physicists interested in scientific what-ifs.”

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