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## EDITORIAL

### FCAA RELATED NEWS, EVENTS AND BOOKS (FCAA–VOLUME 19–6–2016)

Virginia Kiryakova

Dear readers,

in the Editorial Notes we announce news for our journal, anniversaries, information on international meetings, events, new books, etc. related to the *FCAA* (“Fractional Calculus and Applied Analysis”) areas.

#### 1. Preface to This Special “FCAA” Issue and Report on the Workshop “Fractality and Fractionality” Lorentz Center, Leiden - The Netherlands, May 17-20, 2016

#### Description and Aims:

The self-similarity phenomena, or fractal phenomena, are being actively investigated by various research groups throughout the world. The reason of such profound interest in these phenomena is their ubiquity in different areas. The fractal behavior can appear statically, in which case it is usually referred to as fractality, or dynamically, in which case it is called fractionality. Statically, fractals appear both in natural sciences, such as geophysics, crystallography, astronomy, biology, chemistry, bioinformatics and in different branches of mathematics: number theory, geometry, theory of differential equations etc. Dynamically, fractal behavior is demonstrated by macroscopic collections of the units that are endowed with the potential to evolve in time. Such collections are object of study in fluid mechanics, physics of nano-particles, electronics, cellular communications, economics, financial mathematics and many other areas. Because of its static nature, the word “fractality” is more common when speaking of deterministic objects, while “fractionality” often means stochastic behavior. Modern concepts of multifractality and multifractionality are further extensions of these notions. They are used to describe the phenomena which are only locally self-similar. Again, the locality here may refer to time (fractionality over small time intervals) or to space (fractality in small space domains).

The proposed conference, while being relatively small in size, aims at bringing together the leading specialists of several fields of expertise:

- fractional calculus;
- fractional equations and fractional dynamics;
- fractional stochastic analysis;
- fractional and multifractional stochastic processes;
- applications of fractal and fractional analysis.

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The choice of topics was motivated by two factors. Firstly, the organizers aim at the widest coverage possible. Secondly, the topics should not be too distant from each other to allow effective communication. The goals of the workshop were thus:

- to stimulate transfer of scientific ideas between different research areas;
- to start new collaborations between researchers from different countries and different research communities;
- to promote exchange of ideas of practical applications.

**Scientific Organizers:**

Yuliya Mishura (Kiev, Ukraine); Georgiy Shevchenko (Kiev, Ukraine); Peter Spreij (Amsterdam, Nijmegen, The Netherlands); Grygoriy Torbin (Kyiv, Ukraine); Martina Zähle (Jena, Germany)

**The Workshop was financially sponsored by:**

Lorentz Center; The Dutch Mathematics Cluster STAR (“Stochastics Theoretical and Applied Research”); The Netherlands Organization for Scientific Research (NWO); Foundation Compositio Mathematica; Kortewegde Vries Institute for Mathematics, University of Amsterdam; Radboud University; Springer.

**Lorentz Center:**

The Lorentz Center is an international center located on the campus of Leiden University, Leiden – the oldest university in the Netherlands. It coordinates and hosts workshops in the sciences, based on the philosophy that science thrives on interaction between creative researchers. The Lorentz Center workshops focus on new collaborations and interactions between scientists from different countries and fields, and with varying seniority. Additional information on Lorentz Center can be found on its webpage at <http://www.lorentzcenter.nl>; <http://www.lorentzcenter.nl/aim.php>.

The organizers and participants due special thanks to the administration and officers of Lorentz Center for accepting and hosting the FaF Workshop, the financial and accommodation support, all infrastructural facilities and technical assistance.

**Participants and Program:**

The number of participants, about 60, reached the maximum capacity of the Lorentz Center. The organizers were forced to turn down many more applications for attendance, due to limited allowed number of participants at Lorentz Center. We were very pleased with the large interest from participants from 20 countries all over the world, that confirmed the intended international character of the workshop. Another positive element was the large participation of young researchers.

The scientific program consisted of 29 plenary lectures (many of them by invited speakers) and 6 discussion sessions (pairwise in parallel) devoted to selected research topics, see at: <http://www.lorentzcenter.nl/lc/web/2016/779/program.php3?wsid=779&venue=Oort>.

Abstracts' brochure is available at <http://www.lorentzcenter.nl/lc/web/2016/779/abstracts.pdf>.

The list of participants included recognized specialists as: A. Ayache (France), S. Cohen (France), G. Di Nunno (Norway), M. Grothaus (Germany), J. Kigami (Japan), V. Kiryakova (Bulgaria), A. Kochubei (Ukraine), V. Kolokoltsov (UK), Y. Kondratiev (Germany), T. Kumagai (Japan), N. Leonenko (UK), J. Lévy Véhel (France), Y. Luchko (Germany), F. Mainardi (Italy), E. Orsingher (Italy), M. Podolskij (Denmark), M. D. Ruiz-Medina (Spain), G. Samorodnitsky (USA), T. Sottinen (Finland), M. Taqqu (USA), etc.

The workshop was concluded by a large “round table” discussion session, where a number of open problems to work on in the future have been posed. Next to the lectures and organized discussion sessions, the program offered ample time for informal discussions, also stimulated by the organizers through long lunch breaks, as well as shorter breaks between the lectures. These discussions also continued after the scheduled lectures, occasionally until after midnight in small groups.



Selected papers with a stochastic content related to the lectures have been invited to a special issue of the journal “*Modern Stochastics: Theory and Applications*” (Co-Editors-in-Chief: K. Kubilius and Yu. Mishura), <https://www.i-journals.org/vtxpp/VMSTA/>.

Some other selected papers with more analytic content have been invited and published in this special issue of “*Fractional Calculus and Applied Analysis*”, combined with few other papers regularly submitted to the journal with topics in stochastics and close to these of “FaF”.

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**2. Report on the Workshop on Future Directions  
in Fractional Calculus Research and Applications  
Michigan State University, East Lansing, MI – USA  
October 17-21, 2016**

The Workshop was organized by Mark Meerschaert and took place in C405 Wells Hall at Michigan State University.

It was by invitation only, and all talks were one hour in length. The goal was to summarize progress to date, and plans for the future, including ongoing research, and new big ideas.

**List of participants and presented talks:**

- Bruce West: Complexity Science and Fractional Calculus
- Alla Sikorskii: Applications of Fractional Calculus to Stochastic Models for Finance
- Ervin Lenzi: Poisson-Nernst-Planck Diffusional Model and Fractional Time Derivatives: Applications to Electrical Response
- ZhenQing Chen: Anomalous Diffusions and Fractional Order Differential Equations
- Richard Magin: A Fractional Derivative Model of Anomalous Diffusion in White and Gray Matter
- Clara Ionescu: How the Fractional Order Impedance Models Influenced Lung Function Device Trends

- Zhi Zhou: Numerical Analysis for Time-Fractional Evolution Equations
- Mohsen Zayernouri: Data-Driven FPDE Modeling and Simulation
- Mark Ainsworth: Analysis and Approximation of a Fractional Cahn-Hilliard Equation
- Nick Laskin: Fractional Quantum Mechanics
- Changpin Li: The Finite Difference Method for Caputo-type Parabolic Equation with Fractional Laplacian
- Hong Wang: Fast Numerical Methods and Mathematical Analysis of Fractional Partial Differential Equations
- David Benson: The Richness of Fractional Integro-Differential Operators Defined by Convolution with the Levy Measure
- Diogo Bolster: Fractional Dispersion and Mixing Driven Reactions
- Rina Schumer: Anomalous Transport, Rough Landscapes, And Preservation of Stratigraphy
- Weihua Deng: Mean Exit Time and Escape Probability for the Anomalous Processes with the Tempered Power-law Waiting Times
- Vaughan Voller: Promoting the Use of Fractional Calculus in the Modeling Engineering Systems
- Yong Zhang: Applications, Challenges, and Suggestions of Fractional-Derivative Models in Simulating Hydrologic Processes
- Qiang Du: Nonlocal Diffusion Models as Bridges Between Local and Fractional Diffusion Models
- Erkan Nane: Space-Time Fractional Stochastic Partial Differential Equations
- Lorenzo Toniazzi: On a Probabilistic Generalization of Fractional Derivatives
- Sergei Fedotov: Nonlinear Fractional PDE's and Their Applications in Biology
- Renat Sibatov: Fractional Derivatives On Cosmic Scales
- HongGuang Sun: Recent Advantages and Open Issues in Anomalous Diffusion Models and Its Numerical Methods
- George Karniadakis: Spectral and High-Order Methods for Solving Fractional PDEs, Smooth and Non-Smooth Solutions
- Gary Bohannan: Preparing the Next Generation of Researchers
- YangQuan Chen: Regional Sensing and Actuation of Fractional Order Distributed Parameter Systems
- J. Tenreiro Machado: A Stranger in a Strange Fractional Land
- Enrico Scalas: Pseudo-Differential Relaxation Equations and Semi-Markov Processes
- Mark Meerschaert: Space-Time Duality and Medical Ultrasound

Poster Session: – A Petrov-Galerkin Spectral Element Method for Fractional Elliptic Problems; – Density Bounds for some Degenerate Stable Driven SDEs; – Boundary Conditions for FPDE on a Finite Interval

More details, the scientific program and links to the abstracts and presentations can be found at <https://stt.msu.edu/FCworkshop/>.

There was an informal voting (by email) for the “best presentation”. As announced by Organizer, M. Meerschaert, the Bruce J. West Award for best paper at the 2016 Workshop on Future Directions in Fractional Calculus Research and Applications went to James Kelly for his talk on medical ultrasound and duality. Also, to mention honorably Alla Sikorskii, Diogo Bolster, Richard Magin, Sergei Fedotov and Mohsen Zayernouri, who all got multiple votes as well for best presentation.



The journal “*Chaos, Solitons & Fractals*” has put out a Call for Papers for substantially extended versions of papers presented at the Workshop.

*J.A. Tenreiro Machado*  
*Polytechnic of Porto, PORTUGAL*  
*e-mail: jtm@isep.ipp.pt*

### 3. Call for Papers in Special Issue of “*Journal of Computational and Applied Mathematics*”

The topic is: “Modern fractional dynamic systems and applications”.

More details on this call can be found at  
<http://www.journals.elsevier.com/journal-of-computational-and-applied-mathematics/call-for-papers/special-issue-on-modern-fractional-dynamic-systems-and-appli>.

Important Dates: – Date first submission expected: March 01, 2017; – Final deadline for submission: June 30, 2017; – Full publication: To be in a date of 2018.

Communicated by: *Amar Debbouche* (Managing Guest Editor)  
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#### 4. Calendar of Events

**“Modern Methods, Problems and Applications of Operator  
Theory and Harmonic Analysis VII” (OTHA–2017)  
(Rostov-on-Don, Russia, April 23–28, 2017)**

More details can be found on

**Website:** <http://otha.sfedu.ru/conf2017/>.

This 7th international conference OTHA is dedicated to the 75 anniversary of birth of Professor Nikolai K. Karapetiants (1942-2005).

Planned sessions: – Functional Analysis and Operator Theory; – Function Theory and Approximation Theory; – Differential Equations and Mathematical Physics (Chair - Vladislav V. Kravchenko); – Hausdorff Operators and Related Topics (Chair - Elijah Lifyand); – Probability-Analytical Models and Methods (Chair - Igor V. Pavlov); – Bioinformatics and Mathematical Modelling (Chair - Alexander V. Melerzanov).

Deadline for registration and for abstracts submission: 01 April, 2017, see templates at the conference website.

Communicated by: *Alexey N. Karapetyants*,

Contacts: [otha.conference@gmail.com](mailto:otha.conference@gmail.com)

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**“International Symposium on Mathematical Methods  
in Engineering” (MME–2017)  
(Ankara, Turkey, April 27–29, 2017)**

More details can be found on

**Website:** <http://mme2017.cankaya.edu.tr/>.

The symposium is organized and hosted by Cankaya University.

Among the main topics, are: – Fractals; – Fractional Calculus and Applications; – Fuzzy Sets and Systems; – Image and Signal Analysis; – Nonlinear Dynamics; – Ordinary Differential Equations and Applications; – Partial Differential Equations and Applications; – Vibration and Control.

Special Session 2: “New developments in applications of fractional calculus” will be organized by C. Pinto and C. Muresan.

Invitation by Prof. Dr. Kenan Tas: Please enclose kindly an abstract of your contribution with your registration form until December 31, 2016.

As Proceedings, special issues in the journals “*Advances in Difference Equations*” and “*Journal Thermal Science*” are planned.

Communicated by: *Dumitru Baleanu*,

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**“International Conference on Nonlinear Dynamics  
and Complexity” (NDC–2017)  
(Lodz, Poland, July 3–5, 2017)**

The conference is organized by Lodz University of Technology and Institute of Applied Computer Science. The scope of the Conference covers the dynamical systems that do not obey the superposition principle, i.e. the nonlinear dynamical systems. Its main aim is to build the platform for participating scientific researchers to exchange their new ideas in order to establish relations for the future scientific collaboration.

Main Topics: – Mathematical tools in nonlinear dynamical system identification, analysis and synthesis; – Identification of Nonlinear Dynamical Systems; – Analysis of Nonlinear Dynamics; – Synthesis of Nonlinear Dynamical Systems; – Numerical Simulation Methods of Nonlinear Systems; – Signal Processing via Nonlinear Methods; – Sliding-mode Control; – Nonlinear Dynamics in Robotics.

Important dates: – Preliminary declaration of participation: December 1st, 2016; – Mini-symposiums proposal: December 15th, 2016; – Submission deadline: February 15th, 2017; – Notification of acceptance: March 15th, 2017; – Submission of final version: April 15th, 2017.

International Program Committee: A.C.J. Luo (Chair), J.L. Garcia Guirao, J.A. Tenreiro Machado (Co-Chairs)

Chair of Local Organizing Committee: Piotr Ostalczyk

Sincerely, *The NDC 2017 Organizing Committee*

Contact: [ndc17@info.p.lodz.pl](mailto:ndc17@info.p.lodz.pl)

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**“The 2017 Symposium on Fractional Derivatives  
and Their Applications” (FDTA ’17)  
(Cleveland, Ohio–USA, August 6–9, 2017)**

More details can be found on

**Websites:** <http://iel.ucdavis.edu/mesa/conferences.php>,  
<https://www.asme.org/events/idetccie>.

The FDTA (Symposium on Fractional Derivatives and Their Applications) was started by Prof. Om Agrawal and other FDTA colleagues in 2003, and continued in odd years.

For the 2017 FDTA Symposium under ASME/IEEE MESA17, papers are solicited in the area of fractional derivatives and their applications. The subjects of the papers may include, but are not limited to, – mathematical modeling of fractional dynamic systems, analytical and numerical



techniques to solve these equations, fractional model of viscoelastic damping; – large scale finite element models of fractional systems and associated numerical scheme; – fractional controller design and system identification; – stability analysis of fractional systems, nonlinear and stochastic fractional dynamic systems; – fractional order models and their experimental verifications, and applications of fractional models to engineering systems in general and mechatronic embedded systems in particular; – fractional calculus based models for cyber-physical systems (CPS) and cyber-human systems (CHS), and in general, intelligent adaptive systems (IAS); – fractional calculus based better characterization of complex systems in general.

Papers with the e-mail addresses of the authors must be submitted online abstract(s) at <https://www.asme.org/events/idetccie> by January 06, 2017. After the abstract submission, authors should submit a full length paper for peer review by Feb. 10, 2017. All manuscripts after a successful review procedure will be published in EI-indexed conference proceedings.

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