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Book reviews

Ronald S. Calinger, Leonhard Euler. Mathematical genius in the Enlightenment, Princeton, NJ: Princeton University Press, 2016, xvii+669 p,
(ISBN 978-0-691-11927-4/hbk; 978-0-691-11927-4/ebook).

As writes the author in the Preface, Leonhard Euler (1707-1783) ranks among the four greatest mathematicians of all time, the other three being Archimedes, Isaac Newton and Karl Friederic Gauss. Although there exist some previous books containing short biographies of Euler, this is the first detailed and comprehensive account on Euler's life, research, computations and professional interactions. The presentation was possible due to the almost completion of more than eighty large volumes of Euler's *Opera Omnia*.

The presentation focusses on the life of Euler and his achievements in calculus and analytical mechanics. As it is well known, Euler was an encyclopedic mind, his publications are written in five languages - most in Latin and French, and some in German, Russian, English. His interests covered a large area of human knowledge (including music, the theory of light and colors, letters to a German princess, construction of ships), so that an analysis of Euler's contributions would require experts from different areas with skills in several languages, working together under the direction of an editor to strengthen a coherent perspective. The author mentions in this direction Clifford Truesdell (the founder of the journal *Archive of History for Exact Sciences*), a master of six languages, including Greek and Latin, who edited five volumes of Opera Omnia and wrote a critical consideration of Euler's writings, especially on his contributions to theoretical physics.

The book present a synoptic study of the full scope of his research, the character of his colleagues and rivals, and the sources of problems, presented in a chronological order, starting with his Swiss years and formation (1707-1727), then his work in Sankt Petersburg Academy (1727-1641), Berlin Academy (1741-1760), and again in Russia, Sankt Petersburg (1760-1783), where he died. In spite of the fact that in the last years he lost his sight he continued to work, thanks to his prodigious memory. A special attention is paid to some rivalries and disputes - Euler, d'Alambert and Clairaut, Maupertuis and König. The polemics around Maupertuis' principle of minimal action and on other of his writings, in which were involved great personalities of the eighteen century, including Voltaire and King Frederick II of Prusia, is discussed at large in Sections 10 and 11 of the book.

Undoubtedly that the present monograph is an important contribution on Euler's life and on his achievements in various areas of human knowledge, being of interest to all people interested in the development of science in historical perspective.

S. Cobzaş

Aref Jeribi and Bilel Krichen; Nonlinear functional analysis in Banach spaces and Banach algebras. Fixed point theory under weak topology for nonlinear operators and block operator matrices with applications, Monographs and Research Notes in Mathematics, CRC Press, Boca Raton, FL, 2016, xvi+355 p, ISBN: 978-1-4822-9909-0/hbk; 978-1-4822-9910-6/ebook.

The book is dedicated to fixed point theory in the weak topology setting and its applications to block operator matrices.

The book discusses various aspects of fixed point theory in Banach spaces and Banach algebras with nice applications to Mathematical Physics and Mathematical Biology. The structure of the book is the following: two main parts: I. *Fixed Point Theory*, II.*Applications to Mathematical Physics and Biology*, preceded by a *Preface* and followed by a consistent References list with 154 titles.

The main topics of the first part are:

I.1. *Fundamentals* (normed spaces, weak topology, measures of weak noncompactness (MNWC), basic tools in Banach algebras, elementary fixed point theorems, positivity and cones);

I.2. *Fixed Point Theory under Weak Topology* (fixed point theorems in DP (Dunford-Pettis) spaces and weak compactness, Banach spaces and weak compactness, fixed point theorems and MNWC, fixed point theorems for multi-valued mappings, some Leray-Schauder's alternatives);

I.3. *Fixed Point Theory in Banach Algebras* (fixed point theorems involving three operators, WC-Banach algebras, Leray-Schauder's alternatives in Banach algebras involving three operators, convex-power condensing operators, ws-compact and ω-convex-power condensing maps);

I.4. *Fixed Point Theory for BOM (Block Operator Matrix) on Banach Spaces and Banach Algebras* (some variants of Schauder's and Krasnoselskii's fixed point theorem for BOM, fixed point theory under weak topology features, fixed point theorems for BOM in Banach algebras, fixed point results in regular cones, BOM with multi-valued inputs);

The focus of the second part is on the applications of the above mentioned theory to:

II.5. *Existence of Solutions for Transport Equations*
II.6. *Existence of Solutions for Nonlinear Integral Equations*
II.7. *Two-Dimensional Boundary Value Problems.*

The book is interesting, clearly written and contains many important results (most of them obtained by the authors of this book) in the field of applied nonlinear analysis. Of course, the focus is on fixed point theory in Banach spaces and Banach

algebras under the weak topology structure. The sources of the presented results are carefully mentioned and interesting open questions are pointed out for further investigations. The book will be an important reference tool for researchers working in fixed point theory and related topics, as well as, for those interested in applications of this theory in other areas, such as physics and biology.

Adrian Petruşel