Recent History of Fractional Calculus

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The fractional calculus started from some speculations of G.W. Leibniz (1695, 1697) and L. Euler (1730), and it has been developed progressively up to now. A list of mathematicians, who have provided important contributions up to the middle of the twentieth century, includes P.S. Laplace (1812), S. F. Lacroix (1819), J. B. J. Fourier (1822), N. H. Abel (1823–1826), J. Liouville (1832–1873), B. Riemann (1847), H. Holmgren (1865–1867), A. K. Grunwald (1867–1872), A. V. Lehnikov (1868–1872), H. Laurent (1884), P. A. Nakrassow (1888), A. Krug (1890), J. Hadamard (1892), O. Heaviside (1912–1912), S. Pincherle (1902), G. H. Hardy and J. E. Littlewood (1917–1918), H. Weyl (1917), P. Levy (1923), A. Marcuard (1927), H. T. Davis (1924–1936), L. E. Post (1930), A. Zygmund (1935–1945), E. R. Love (1938–1939), A. Erdélyi (1939–1965), H. Kober (1940), D. V. Widder (1941), M. Riesz (1949), W. Feller (1952).

In recent years considerable interest in fractional calculus has been stimulated by the applications it finds in different areas of applied sciences like physics and engineering, possibly including fractal phenomena. Now there are more books of proceedings and special issues of journals published that refer to the applications of fractional calculus. Selected and improved papers presented at conferences and advanced schools, concerning various applications after a joint collaboration begun in 1968, published is ascribed to K. B. Oldham and J. Spanier who, shortly after his Ph.D. dissertation on Fourier analysis at the University of New Haven in June 1974, and edited on Fractional Calculus and its Applications at the B. Ross who, recently, on Fractional Calculus in several scientific areas including special functions, control theory, chemical physics, stochastic processes, anomalous diffusion, rheology. Several special issues appeared in the last decade which contain selected and improved papers presented at conferences and advanced schools, concerning various applications of fractional calculus. Already since several years, there exist two international journals devoted almost exclusively to the subject of fractional calculus: Journal of Fractional Calculus (Editor-in-Chief: K. Nishimoto, Japan) started in 1992, and Fractional Calculus and Applied Analysis (Managing Editor: V. Kiryakova, Bulgaria) started in 1998. Recently the new journal Fractional Dynamic Systems has been announced to start in 2010.

The authors believe that the volume of research in the area of fractional calculus will continue to grow in the forthcoming years and that it will constitute an important tool in the scientific progress of mankind.

B. Ross (Editor), Fractional Calculus and Its Applications: Proceedings of the Int. Conf. held at the University of New Haven, June 1974 (Lecture Notes in Mathematics, 1975).

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