

**REPRINTED PAPER * by M. Caputo and F. Mainardi,
from the journal “*Pure and Applied Geophysics (PAGEOPH)*”,
vol. 91, No 1 (1971), pp. 134-147**

EDITORIAL NOTE: Prof. Caputo is a Honorary Member of Editorial Board of our journal. This year 2007, together with his *80th personal anniversary*, we pay attention to the *40th anniversary of the so-called “Caputo derivative”*. This variant of the operator for differentiation of fractional order, as oriented towards applications in mechanics – especially to linear models of viscoelasticity, appeared first in Caputo’s paper of 1967, “*Linear Models of Dissipation whose Q is almost Frequency Independent – II*”, *Geophys. J. R. Astr. Soc.*, vol. **13**, No 5, Nov. 1967, pp. 529-539. The so called “PAGEOPH”-paper of 1971 by M. Caputo and F. Mainardi (then as his Ph.D. student), which we reproduce in the next 14 pages, continues the use of the Caputo derivative (operator (A.16), p. 146). However, the main contribution of this paper is of being *one of the first proposing a plot of the Mittag-Leffler function*, now recognised as the *Queen-function of Fractional Calculus*. On those times (1971), without possibilities to take profit of software packages like *MATHEMATICA*, *MAPLE* and *MATLAB*, this task was difficult one as managing with series expansions convergent only in mathematical sense but not in the numerical sense. Some other authors worked also on similar problems either simultaneously but independently, or years afterwards. Although they recognised the Caputo - Mainardi achievements and priorities in private discussions, correspondence and public lectures, the Caputo-Mainardi PAGEOPH-1971 paper was often forgotten to be (or not properly) referred to ... Therefore, we find it interesting and useful for our audience, as a journal closely specialized on Applied Fractional Calculus and Special Functions, to reproduce the paper in this jubilee issue.

* *Special thanks* are due, for the permission of 13 Nov. 2007 to reprint this article, to: *Birkhäuser Verlag AG (Basel)*, as Publisher of the journal “*Pure and Applied Geophysics*”. Currently, the soft copy of this paper (DOI: 10.1007/BF00879562) can be ordered via the SpringerLink Web-site, at: www.springerlink.com/content/wv5233j83145/?sortorder=asc&p0=10

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