Contribution ID: **14** Type: **not specified**

Details on Lagrange's Method as Described by Maxwell in his Electromagnetic Theory

Wednesday 9 September 2020 10:55 (25 minutes)

Both in A treatise on electricity and magnetism (1873, 2 vols.) and A dynamical theory of the electromagnetic field (1864) Maxwell converted in a mathematical language the main content of the Experimental Researchers in Electricity by Michael Faraday. He went beyond the Newtonian approach reaching a new physics mathematics based on the concept of energy instead of that of force. First, he mathematically stressed the three –as he called –Lagrange's methods and then used Lagrangian formulating through the idea of connected mechanical system described by means of Lagrange's [⋯] equations of motion of a connected system. In our talk, the first part of the Lagrangian and its specific formulation adopted by Maxwell are discussed.

**Selected References **

Faraday M (1839–1855) Experimental Researches in Electricity. 3 vols. Taylor, London
Gillispie CC, Pisano R (2014) Lazare and Sadi Carnot. A Scientific and Filial Relationship. 2nd ed. Springer, Dordrecht
Lagrange JL (1788) Méchanique analitique. Desaint, Paris
Maxwell JC (1873) A Treatise on Electricity and Magnetism. 2 vols. CP, Oxford
Pisano R (2013) On Lagrangian in Maxwell's electromagnetic theory. Scientiatum VI. The University of Federate. Rio de Janeiro Press, Brazil, pp. 44-59
Pisano R, Bussotti P (2020) Historical and Foundational Details on the Method of Infinite Descent: Every Prime Number of the Form 4n+1 is the Sum of Two Squares. Foundations of Science 1:1-32
Pisano R, Marmottini D (2017) Nature of Science Teaching: Notes on the Lagrangian Methods in Maxwell's Electromagnetic Theory. SISFA Proceedings. Pavia. PUV, pp. 263-268

Authors: Prof. PISANO, Raffaele (IEMN, Lille University, Lille, France; CPNSS, LSE, UK); Prof. MARMOTTINI, Donatella (Campus dei Licei, Cisterna di Latina, Italy)

Presenter: Prof. MARMOTTINI, Donatella (Campus dei Licei, Cisterna di Latina, Italy)

Session Classification: Da Newton a Maxwell

Track Classification: sisfa 2020