

James Clerk Maxwell: life and science

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Maxwell is frequently remembered in the 21st century for his 1865 publication concluding “Hence electromagnetic science leads to exactly the same conclusions as optical science with respect to the direction of the disturbances which can be propagated through the field; both affirm the propagation of transverse vibrations, and both give the same velocity of propagation” [1] and for his extended presentation of electromagnetic theory [2]. These, and his related body of work, served to join the sciences of optics, electricity, and magnetism. This accomplishment should also be remembered in the context of very limited information concerning the subatomic nature of electricity and the absence of a convincing demonstration of electromagnetic wave propagation for most of the decade following Maxwell’s death in 1879. His contributions to other areas of physics were widely appreciated by 1880: his friend Tait asserted that Maxwell “...had no rival...in the whole wide domain of molecular forces...” in connection with his initial and advanced versions of his statistical kinetic theory of gases and his masterful measurements of the viscosity of gases. Remember also in the context of the present Conference, Maxwell’s prediction of radiation pressure [2] and his kinetic methods eventually incorporated into radiative transfer theory (differential cross sections and the Maxwell-Boltzmann transport equation).

While Maxwell was cautious concerning controversies brought about by contemporary “popular men of science,” his perspectives on such issues were noticed by his more intimate friends and by some of the public. His personality was such that one who came under Maxwell’s influence as a student in the 1870s recalled in 1895 that Maxwell was “deeply loved by all who knew him.” This presentation will include some findings of recent scholarship concerning Maxwell’s research, interests, and early legacy [3].

[1] J. C. Maxwell, *Phil. Trans. Royal Soc. (London)* 155, 459-512 (1865).

[2] J. C. Maxwell, *A Treatise on Electricity and Magnetism* (University Press, Oxford, 1873).

[3] R. Flood, M. McCartney, and A. Whitaker (editors), *James Clerk Maxwell: Perspectives on his Life and Work* (University Press, Oxford, 2014).