

Doors opened by Thom in Morse theory and towards the h-principle

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We will review the content and the influence of two papers by R. Thom. The first is his 1949 note “sur une partition en cellules associée à une fonction sur une variété” where he exhibits the cell decomposition provided by any gradient of a Morse function ; we will also discuss the two unpublished manuscripts dated 1957 where Thom applies Morse Theory to analyze the topology of complex affine algebraic/analytic manifolds. The second article is the 1959 paper “remarques sur les problèmes comportant des inéquations différentielles globales” where Thom scatters seeds for the general study of open differential relations, a theme that Gromov will later embrace in the vast theory of the h-principle.

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