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Mittag-Leffler's Theorem: Genesis and Development of a Mathematical Fact

Gösta Mittag-Leffler (1846–1927) remains well-known, in part for the theorem that bears his name. Roughly this states that one can define a function, meromorphic on a subset of the complex plane, such that the principal parts of the function's Laurent series at a given collection of poles are specified in advance. Mittag-Leffler's original work on the theorem was undertaken exactly in the pattern of his mentor Weierstrass, whose famous 1876 paper on single-valued analytic functions constitutes a kind of template for Mittag-Leffler's research and presentation. Between 1876, when the first version of the theorem was published in Swedish, and 1884, when a long paper on the subject appeared in Mittag-Leffler's new journal *Acta Mathematica*, Mittag-Leffler progressively worked on generalizing the theorem to apply to larger collections of poles and essential singularities. It was in this context that he came to view the work of Cantor on infinite point sets as important, a position which was shared by very few researchers of the time. Indeed, the development of Mittag-Leffler's research allows us to see how the currents of opinion and mathematical fashion shaped the focus of Mittag-Leffler's labours, and to some degree the nature of his results. Based on published and unpublished correspondence with Hermite, Weierstrass, Cantor, Poincaré and others, this paper will look at some highlights of the development and reception of Mittag-Leffler's theorem.

This paper describes joint work with Laura E. Turner (laurat@sfu.ca, Mathematics, Simon Fraser University).