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A review is given of recent theoretical investigations of spin density fluctuations in magnetic metals from a very general point of view, leading to a unified picture of magnetism that interpolates between the long-familiar local moment limit and a newly established limit of spatially extended spin fluctuations. [The *SCI*® indicates that this paper has been cited in over 195 publications, making it the most-cited paper in this journal.]

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In late 1971 A. Kawabata and I were excited by finding a possible new mechanism for the Curie-Weiss (CW) magnetic susceptibility in metallic or itinerant electron magnets, as a consequence of a theoretical approach one step beyond the prevailing theories. This theory, which dealt with the spatially extended modes of spin density fluctuations instead of a set of local magnetic moments, was published after further elaboration[1,2] and is now called the self-consistent renormalization (SCR) theory of spin fluctuations. A phenomenological theory on the same physics was independently proposed by K.K. Murata and S. Doniach[3] with qualitatively similar results; later it turned out to correspond to the high temperature approximation of the above theory.

This new mechanism for the CW susceptibility was believed to release us from the prejudice of connecting the CW law directly with the local moments picture, thus changing significantly the famous controversy (over 40 years old) between the itinerant and localized models for metallic magnetism. As a matter of fact, I had thought it necessary to find a new mechanism in order to explain the CW susceptibilities exhibited by weak itinerant ferromagnets, such as $ZrZn_2$ and Sc_3In discovered by B.T. Matthias et al. around 1960, and this was one of the motivations for pursuing this theoretical approach in collaboration with my colleague.

In subsequent years various novel predictions of the SCR theory on weak itinerant ferro- and antiferromagnets were tested experimentally with overwhelming success. We thus considered that the weak itinerant ferro- and antiferromagnets constituted an important category of magnets in the opposite extreme to the familiar local moments systems; thus, many ferro- and antiferromagnetic metals belonged to the intermediate regime between these extremes. As a natural consequence of this observation, we started to develop a theory of interpolation between these two extremes within an adiabatic approximation, which led to a unified picture of magnetism described in terms of very general spin fluctuations.[4] One of the important new concepts here was the variable local amplitude of the spin fluctuation, which gave extra degrees of freedom over the conventional local moment picture and led to clarifications of various hitherto unexplained phenomena.

This paper summarizes these developments up to 1979 in the study of itinerant electron magnetism. As a matter of fact, the editor of the journal, on advice from V. Jaccarino, invited me to write this review. A Russian journal, *Uspekhi Fizicheskikh Nauk*, soon published a translation of this paper.[5] I think that this paper has been cited frequently because it dealt with a fundamental issue concerned with a rather wide range of problems in magnetism. I was selected for the 1979 Nishina Memorial Prize for these investigations.

There were further advances in this area after this paper was written. A survey of the present status of the field can be found in my 1985 publication.[6] Finally, I would like to commend the excellent contributions and cooperation of my colleagues. Each played important roles at certain stages of these developments.

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3. Murata K K & Doniach S. Theory of magnetic fluctuations in itinerant ferromagnets. *Phys. Rev. Lett.* 29:285-8, 1972. (Cited 125 times.)
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