Theoretical study of correlation effects in condensed-matter systems

Masahisa TSUCHIIZU [Physics Course]

\[
\frac{d}{dl} \chi(q) = \frac{d}{dl} R(q; k_1, k_2)
\]

\[
\frac{d}{dl} \Gamma(k_1, k_2; k_3, k_4)
\]

Renormalization-group equations

In transition-metal compounds and molecular conductors, various exotic electronic states, such as high-\(T_c\) superconducting states, are realized because of the strong correlation between electrons. The aim of my research is to elucidate the basic principles behind these phenomena theoretically. Especially, I am working on developing a new scheme of the "renormalization-group method" which can treat the higher-order many-body correlation effects.

Keywords: Condensed matter theory; Strong correlation; Renormalization-group method