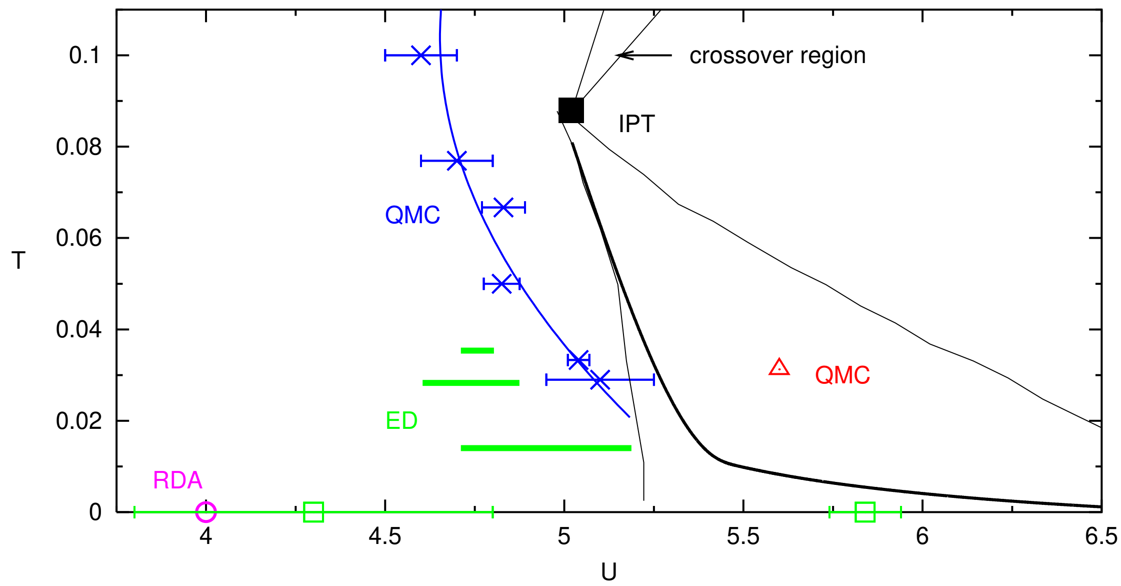

Figure 3.9: Status of the phase diagram of the fully frustrated Bethe lattice in early 1999: new QMC results [crosses; Schlipf et al. (1999)] indicate that the metallic phase breaks down before the IPT coexistence region (cf. Fig. 3.7) with the supporting QMC coexistence point (triangle, cf. Fig. 3.8 b) is reached. As an estimate for U_{c2}, the new QMC results are roughly consistent with ED for finite T (Hofstetter, 1998) and $T = 0$ (Georges et al., 1996); the transition is, however, observed as continuous in QMC in contrast to ED and IPT. The RDA result (circle) also supports a continuous transition, but for much smaller interaction U.

(down to $T = 0.05$). Initial hysteresis near the computed transition line was found to disappear upon sufficiently long iteration. Schlipf also noted that no ED results for the MIT at finite temperature had been published. Using Krauth's ED code as made available in connection with the review, Hofstetter (1998) computed a rough estimate of the coexistence region (thick horizontal lines in Fig. 3.9). The observed coexistence region is much smaller than in IPT and shifted to smaller values of U. Due to this disagreement and since also the ED could in principle fail near the MIT when the width of the quasiparticle peak becomes smaller than its energy resolution, it appeared conceivable that the IPT scenario was even *qualitatively* wrong. The QMC calculations were refined and extended to lower temperatures (as part of this thesis). In order to exclude the possibility of errors in the implementation as the reason for this discrepancy, the collaboration was extended to include Jarrell who performed independent QMC runs. As a final conclusion, the metal-insulator transition was found to be continuous at least down to $T = 1/35$, about a factor of 3 below the IPT estimate for T^* (Schlipf et al., 1999).[11] These QMC results (crosses) are also shown in Fig. 3.9. Here, the error bars for $U_c(T)$ extend in horizontal direction since

[11] Note that the estimate for T^* is even higher in more recent IPT calculations (Kotliar, Lange, and Rozenberg, 2000); see Table 3.2.