Properties of Quarkonia at T_c

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We will report on theoretical attempts to calculate the properties of heavy quarkonia around and above the critical temperature. Recent lattice calculations based on maximum entropy show that J/ψ, in contrast to earlier expectations, will survive above T_c and dissolve only at a higher temperature. Hence, change of spectral properties, which cannot be seen within current resolution of lattice calculations, may exist in QGP and can reflect the properties of the strongly coupled QGP, at temperature not so higher than T_c. We first review the results and limitations to calculate the properties of J/ψ in QGP using perturbative QCD. We then report on a recent investigation of the medium-induced change of mass and width of J/ψ and η_c across the phase transition in hot gluonic matter using QCD sum rules. Although the stability of the operator product expansion side seems to break down at $T > 1.06T_c$ for the vector channel and $T > 1.04T_c$ for the pseudoscalar channel, we find a sudden change of the spectral property across the critical temperature T_c, which originates from an equally rapid change of the scalar gluon condensate characterized by $\varepsilon - 3p$. By parameterizing the ground state of the spectral density by the Breit-Wigner form, we find that for both J/ψ and η_c, the masses suddenly decrease maximally by a few hundreds of MeV and the widths broaden to ~ 100 MeV slightly above T_c. In view of the present result, we also comment on other approaches and speculate on possible future investigation.