BCS superconductivity in quantum critical metals JIAN-HUANG
SHE, JAN ZAANEN, Instituut-Lorentz, Universiteit Leiden — We consider the
superconducting transition in fermionic quantum critical systems. Assuming the
validity of Migdal theorem, the gap equation can be written in terms of the retarded
pair susceptibility. Scale invariance leads to an algebraic gap equation, instead
of the BCS exponential form. With reasonably small glue strength, we can get
very large transition temperatures comparable to those observed in cuprates. We
get nice dome structures around the QCP for a wide range of parameters. With
a non-Lorentzian dynamical exponent, the upper critical field is greatly enhanced
when approaching the critical point, while the transition temperature only changes
modestly, in agreement with recent experiments on heavy fermions.

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