I will present some recent results concerning the higher gradient integrability of σ-harmonic functions u with discontinuous coefficients σ, i.e. weak solutions of $\mathrm{div}(\sigma\nabla u) = 0$. When σ is assumed to be symmetric, then the optimal integrability exponent of the gradient field is known thanks to the work of Astala and Leonetti & Nesi. I will discuss the case when only the ellipticity is fixed and σ is otherwise unconstrained and show that the optimal exponent is attained on the class of two-phase conductivities $\sigma : \Omega \subset R^2 \to \{\sigma 1, \sigma 2\} \subset M^{2\times 2}$. The optimal exponent is established, in the strongest possible way of the existence of so-called exact solutions, via the exhibition of optimal microgeometries. (Joint work with V. Nesi and M. Ponsiglione.)