The generalized Stefan-Boltzmann law

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We reconsider the thermodynamic derivation by L. Boltzmann of the Stefan law and we generalize it for various different physical systems *whose chemical potential vanishes*. Being only based on classical arguments, therefore independent of the quantum statistics, this derivation applies as well to the saturated Bose gas in various geometries as to "compensated" Fermi gas near a neutrality point, such as a gas of Weyl Fermions. It unifies in the same framework the thermodynamics of many different bosonic or fermionic non-interacting gases which were until now described in completely different contexts.