Let K_t be either the heat or the Poisson kernel on $\mathbb{R}^n$ and consider $\mathrm{BMO}_K(\mathbb{R}^n)$ equipped with the norm

$$\|\varphi\|_K := \sup_{z \in \mathbb{R}^{n+1}_+} \big(\varphi^2(z) - \varphi(z)^2\big)^{1/2},$$

where $g(z)$ denotes the K-extension of a function g on $\mathbb{R}^n$ into the upper half-space: $g(x,t) = (K_t * g)(x)$.

We establish the following transference principle between the classical $\mathrm{BMO}(Q)$ on an interval and $\mathrm{BMO}_K(\mathbb{R}^n)$: If an integral functional admits an estimate on $\mathrm{BMO}(Q)$, then exactly the same estimate holds for $\mathrm{BMO}_K(\mathbb{R}^n)$, with all Euclidean averages replaced by K-averages. In particular, all such estimates are dimension-free. The proof uses Bellman functions for $\mathrm{BMO}(Q)$ as locally concave majorants for their K-analogs, in conjunction with the probabilistic representation of the kernel K_t. Analogous results hold for related function classes, such as A_p. This is joint work with Pavel Zatitiskii.