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Hypoelliptic heat kernels on nilpotent Lie groups.

We use structure theory and a Fourier transform on nilpotent Lie groups to derive an explicit formula for the hypoelliptic heat kernel. This can be interpreted as an eigenfunction expansion of a heat kernel. One of the main ingredients in proving this formula is Kirillov's orbit method. This allows us to write the corresponding hypoelliptic heat kernel using an integral formula over a Euclidean space. As an application, one can describe a short-time behavior of these heat kernels. This is based on joint work with Malva Asaad. (Received September 14, 2015)