Completely monotone functions and applications

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Complete monotonicity of a smooth function on a convex cone is a strong property given by infinitely many sign conditions on the directional derivatives of the function. I will discuss results and questions around this concept that are motivated by research in convex optimization (interior-point methods), algebraic statistics (exponential families) and real algebraic geometry (hyperbolic and nonnegative polynomials). The talk is based on joint works with M. Michalek, B. Sturmfels and J.-B. Lasserre.