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The mirror symmetry conjecture says that the symplectic geometry of a Calabi-Yau manifold  $X$  is equivalent to the complex geometry of another Calabi-Yau manifold  $\check{X}$ , and vice versa. Strominger-Yau-Zaslow conjectured a geometric explanation of that:  $X$  should admit a special Lagrangian torus fibration and  $\check{X}$  can be obtained by dualizing the fibration. Moreover, the symplectic geometry of  $X$  and complex geometry of  $\check{X}$  should be interchanged through fiberwise Fourier-Mukai type transforms, with suitable modifications called quantum corrections. In this talk, we will briefly discuss the constructions of Fourier-type transforms on a torus and the dual torus, and related applications in family cases. This is a joint work with Conan Naichung Leung and Chit Ma. (Received January 06, 2012)