Tridiagonalization' Special Functions And Algebras

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In the tridiagonalization approach the analysis of special functions and orthogonal polynomial can be carried in a bottom up fashion along hierarchies of the Askey type. This talk will review recent advances in this area. The tridiagonalization of the hypergeometric operator leads to Racah/Wilson polynomials and their associated algebra. The Heun equation also arises in this framework under a generalized scheme. The tridiagonalization of the big q-Jacobi recurrence operator can be used to relate the Askey-Wilson polynomials to representations of the q-oscillator algebra. An embedding of the Bannai-Ito algebra into the Lie superalgebra osp(1,2) will be seen to correspond in the holomorphic/Dunkl realization to generators comprising the differential-difference operator which is diagonalized by the little-1 Jacobi polynomials and a partner obtained by tridiagonalization of the latter.

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