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Abstract for an Invited Paper  
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**Transport in Molecular Junctions: Thoughts Coherent and Incoherent**

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Current experimental efforts are clarifying quite beautifully the nature of charge transport in so-called molecular junctions, in which a single molecule provides the channel for current flow between two electrodes. The theoretical modeling of such structures is challenging, because of the uncertainty of geometry, the nonequilibrium nature of the process, and the variety of available mechanisms. The talk will center on the formulation of the problem in terms of non-equilibrium theory, and then on the generalizations needed to make that simple picture relevant to the real experimental situation. These include antiresonances, vibronic coupling and its control, structural disorder and representations for the electronic structure. Comments will be made on the measurements of inelastic spectra, and the information to be gained from them.