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Emma Previato* (ep@bu.edu), Department of Mathematics and Statistics, Boston University, Boston, MA 02215-2411. *Sigma function and random matrices.*

A link between random-matrix theory and isomonodromy deformations was found in the 1970s; then isomonodromy was related to hierarchies of integrable PDEs: there is no systematic way of transforming one type of problems into the other. The theme of this talk is that of deriving both types of equations from the study of special functions, with the goal of creating a dictionary.

Sato's tau function was written (A. Nakayashiki), in the algebro-geometric case, in terms of the (Kleinian) sigma function, generalized by V.M. Buchstaber, V.Z. Enolskii and D. Leykin. Moving the curve in moduli, sigma obeys a Gauss-Manin connection. Sato's tau function was used to produce solutions to isomonodromy problems: apparently, not yet the function sigma. This issue has potential applications to mirror symmetry (Yu.I. Manin).

Firstly, we give a heat equation for sigma (work with J.C. Eilbeck, J. Gibbons and Y. Ônishi). Then we give a link between integrable PDEs and ODEs with the Painlevé property (work with G.N. Benes). Lastly, we suggest a different interpretation of the appearance of the sigma function in the dispersionless hierarchies in terms of isomonodromy; we propose generalizations of Painlevé VI in this setting (work with V.Z. Enolskii and F. Nijhoff). (Received September 19, 2011)