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**Jacek Szmigielski\*** ([szmigiel@usask.ca](mailto:szmigiel@usask.ca)), Department of Mathematics and Statistics,  
University of Saskatchewan, Saskatoon, Saskatchewan Canada. *Discrete Cubic String and Peakons.*

The theory of the Degasperis-Processi equation is very closely related to the spectral theory of a generalized string problem of order three. I will describe two types of string problems which play a role in the analysis of special, weak solutions called peakons. These two problems generalize the Dirichlet and Neumann string to the cubic case. The inverse problem in both cases relevant to peakons has been recently solved by generalizing Stieljes' technique of analytic continued fractions to dimension 2. I will describe the main steps of the solution for the Neumann string with emphasis on the role played by totally nonnegative matrices. This is part of joint work with Hans Lundmark and Jennifer Kohlenberg. (Received February 09, 2006)