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**Nalini Joshi\*** ([nalini.joshi@sydney.edu.au](mailto:nalini.joshi@sydney.edu.au)), School of Mathematics and Statistics F07,  
University of Sydney, 2006, Australia. *Quicksilver solutions of a  $q$ -discrete Painlevé equation.*

Critical solutions of the classical Painlevé equations arise as universal limits in many nonlinear systems. Their asymptotic properties have been studied from several different points of view. This talk focusses on their discrete versions, for which many questions remain open.

Much of the activity in this field has been concentrated on deducing the correct discrete versions of the Painlevé equations, finding transformations and other algebraic properties and describing solutions that can be expressed in terms of earlier known functions, such as  $q$ -hypergeometric functions.

In this talk, I focus on solutions that cannot be expressed in terms of earlier known functions. In particular, I will describe solutions of the so called  $q - P_{\text{III}}$  equation, which is a  $q$ -discrete version of the third Painlevé equation. The solutions I will describe are analogous to the critical or the tritronquée solutions, but their complex analytic properties differ. For this reason, I propose a new name: *quicksilver* solutions and provide a glimpse into their asymptotic properties. (Received August 05, 2012)