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Rutgers University
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**Dressing with Simple Poles Can Get You Naked: Integrability
and Vesture for Harmonic Maps and Einstein's Equations**

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Abstract

Vesture refers to the recipe for finding nontrivial exact solutions to a nonlinear differential equation by “dressing” a known solution (which could be rather trivial) with one or more prescribed singularities. This is in particular possible if the nonlinear equation is completely integrable. We will explain what that means, and provide examples from the theory of harmonic maps, and General Relativity, to demonstrate how this procedure works. We will in particular show how to obtain the nontrivial and physically interesting hyperextreme Kerr metric, which has a naked ring singularity at its center, from the trivial solution of Einstein Vacuum Equations, namely the Minkowski metric. This is joint work with Shabnam Beheshti.