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Carla Farsi (leonardhuang@unr.edu), **Leonard Tristan Huang*** (leonardhuang@unr.edu),
Alex Kumjian and **Judith Packer**. *Cocycles on Deaconu-Renault Groupoids, and KMS States
for Generalized Gauge Dynamics.*

In this talk, we introduce a new technique of constructing KMS states on the C^* -algebra of the Deaconu-Renault groupoid associated to a commuting family of k surjective local homeomorphisms on a compact metrizable space. This technique is based on two things: (i) a new result that classifies all continuous \mathbb{R} -valued 1-cocycles on a Deaconu-Renault groupoid in terms of commuting families of Ruelle transfer operators, and (ii) a generalized Ruelle-Perron-Frobenius Theorem for such commuting families. We explain how our technique can be applied to discrete higher-rank graphs to recover existing results and to produce new ones. We also present the first known analysis of KMS states on the C^* -algebras of topological higher-rank graphs. We hope that our work will appeal to C^* -algebraists and ergodic theorists alike. (Received September 17, 2019)