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Emergent critical phase and Ricci flow in a 2D frustrated Heisenberg model PETER P. ORTH, Karlsruhe Institute of Technology (KIT), PREMALA CHANDRA, PIERS COLEMAN, Rutgers University, JOERG SCHMALIAN, Karlsruhe Institute of Technology (KIT) — We introduce a two-dimensional frustrated Heisenberg antiferromagnet on interpenetrating honeycomb and triangular lattices [1]. Classically the two sublattices decouple, and "order from disorder" drives them into a coplanar state. Applying Friedan's geometric approach to nonlinear sigma models, we obtain the scaling of the spin-stiffnesses governed by the Ricci flow of a 4D metric tensor. At low temperatures, the relative phase between the spins on the two sublattices is described by a six-state clock model with an emergent critical phase and two Berezinskii-Kosterlitz-Thouless (BKT) phase transitions.

[1] Peter P. Orth, Premala Chandra, Piers Coleman, and Jörg Schmalian, arXiv:1206.5740v1 (2012) (accepted for Phys. Rev. Lett.)

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