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Pattern Crystallization due to Spatially Periodic Forcing JONATHAN MCCOY, Cornell University, WILL BRUNNER, Max Planck Institute for Dynamics and Self-Organization, WERNER PESCH, University of Bayreuth, EBERHARD BODENSCHATZ, Max Planck Institute for Dynamics and Self-Organization, Cornell University — We present experimental results on Rayleigh-Benard convection subjected to spatially periodic forcing. We identify a new type of coherent structure - a localized orientational defect - arising out of spatial entrainment of the convection pattern to the forcing. Localized, "crystalline" domains with robust orientational order are a characteristic feature of chaotic states containing these defects. Local analysis reveals that the structure of these domains is a consequence of three elements: underlying reflection symmetry, entrainment, and an annulus of preferred periodicities. We are grateful for support from the National Science Foundation, under grant no. DMR- 0305151, and from the Max Planck Society.

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