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Geir Agnarsson* (math.geir@gmail.com), George Mason University, Department of Mathematical Sciences, 4400 University Drive, MS: 3F2, Fairfax, VA 22030. *Properties and structures of graphs through homomorphisms.*

Similarly to groups, rings and topological spaces, many properties of graphs and information about their structures can be obtained from graph homomorphisms. For example, a simple graph G is vertex c -colorable if and only if there is a graph homomorphism from G to the complete graph K_c on c vertices. The problem of extending a given vertex map $f : U \rightarrow V(G)$ to a graph homomorphism $\phi_f : H \rightarrow G$, where $U \subseteq V(H)$ is well-known and has a nice solution. In this talk we first review some celebrated results on extensions of vertex maps to graph homomorphisms and then present some recent results on the structure of graphs for which we can extend some vertex maps to homomorphisms with certain particular properties. – This is joint work with Li Chen. (Received January 14, 2019)