A discrete-topology genesis for the right-angled relations in Artin's braid groups

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While the idea of braiding can be traced back to A. Hurwitz in 1891, it was only until 1925 that the notion of a braid group was formalized by E. Artin, who showed that the braid group on n strands can be presented by $n-1$ generators subject to certain commutativity (right-angled) and braiding (Artin-Tits) relations. Such a presentation was later confirmed by R. Fox and L. Neuwirth via configuration spaces. In this talk we explain how Abrams' discrete configuration spaces allow us to extract the right-angled relations from the Artin-Tits relations. The resulting discrete geometric object is of interest in physics as it provides a model for the phase space of a 2-dimensional hard-squares system. This is joint work with Matt Kahle.

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