

# GRAPHS THAT SUPPORT A UNIFORM STRUCTURE

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The notion of a uniform poset was introduced in 1990 by Terwilliger [2]. Roughly speaking, a graded poset  $P$  is uniform if its *raising* and *lowering* matrices satisfy certain linear dependencies. This notion was easily adopted by bipartite graphs, and uniform structures of  $Q$ -polynomial bipartite distance-regular graphs were studied in detail [1].

Assume that  $\Gamma$  is a non-bipartite graph, and pick a vertex  $x$  of  $\Gamma$ . In this talk, we first define what it means for  $\Gamma$  to *support a uniform structure with respect to  $x$* . In case  $\Gamma$  supports a uniform structure (with respect to  $x$ ), we discuss algebraic properties of the corresponding Terwilliger algebra  $T = T(x)$  and present some classification results when  $\Gamma$  is distance-regular with classical parameters.

## References

- [1] MIKLAVIČ, Štefko; TERWILLIGER, Paul. Bipartite  $Q$ -polynomial distance-regular graphs and uniform posets. *Journal of Algebraic Combinatorics*, **38** (2013), 225–242.
- [2] TERWILLIGER, Paul. The incidence algebra of a uniform poset. *Coding theory and design theory*, Part I (1990), 193–212.