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Linear Extensions of Posets – Gray codes, fast generation algorithms, and a long-standing conjecture

Frank Ruskey's work in generating combinatorial objects broke ground in a to that point barely explored area, producing algorithms of elegance and practical value. In this talk we survey the progress made on the problem of generating the linear extensions of posets. We review the state of the art, present some previously unpublished results, and explore the status of Ruskey's conjecture, posed in *Discrete Mathematics* in 1988, which states that when the linear extension graph of a poset is balanced – i.e., its two partite sets are the same size – then it has a Hamilton cycle.