Circular-arc graphs are intersection graphs of arcs on the circle. In this talk we will present the first polynomial time algorithm testing whether two circular-arc graphs are isomorphic. To accomplish our task we construct decomposition trees, which are the structures representing all normalized intersection models of circular-arc graphs. Normalized models reflect the neighbourhood relation in circular-arc graphs and can be seen as their canonical representations; in particular, every intersection model can be easily transformed into a normalized one. Decomposition trees generalize PQ-trees, which are the structures that represent all intersection models of interval graphs. Given such trees for circular-arc graphs, a linear-time algorithm for the isomorphism problem for this class of graphs follows easily.

Our work adapts and appropriately extends the previous work on the similar topic done by Hsu [*SIAM J. Comput. 24(3), 411–439, (1995)*]. In his work, Hsu developed decomposition trees representing all normalized models of circular-arc graphs. However due to the counterexample given by Curtis, Lin, McConnell, Nussbaum, Soulignac, Spinrad, and Szwarcfiter [*Discrete Math. Theor. Comput. Sci., 15(1), 157–182, 2013*], his decomposition trees can not be used by algorithms testing isomorphism of circular-arc graphs.