1163-F1-1470 **Casey L. Johnson*** (casey.johnson@cgu.edu), 504 1/2 Begonia Ave, Corona Del Mar, CA 92625. *Can you hear the shape of a Stieltjes star graph?*

How much information do the frequencies of small vibrations for star graph configurations of connected Stieltjes strings give us? The spectrum of a single Stieltjes string, a thread bearing a finite number of point masses, is uniquely determined by the number and size of the masses. In 2002, F.R. Gantmakher and M.G. Krein solved the inverse problem which identified the location and mass of each bead given just the spectrum corresponding to Dirichlet boundary conditions and the spectrum corresponding to Neumann boundary conditions. Joining multiple Stieltjes strings of various lengths together to form a star graph shape has fascinating implications on the spectrum of the graph. For these new star graphs, is the spectrum still uniquely determined? Can we determine the configuration of the star graph from the spectrum of the graph? (Received September 15, 2020)