1125-I5-48 **Paul R. Bouthellier*** (pbouthe@pitt.edu), 504 East Main Street, Titusville, PA 16354. *Tennis Anyone? Mathematical Modeling and Markov Processes.*

In this talk we shall create a mathematical model for the game of tennis. This model will then be used to create computer simulations for a singles tennis match. Our model is based on factors such as: first and second serve percentages for both players, percentages of points won on first and second serves, percentage of points won in rallies lasting so many shots (duration), and win-loss records in tie-breaks. Other factors such as court surfaces, best of three or five set games and endurance can also be built into the model. Estimations of such parameters can be obtained from recent head-to-head matches between players on various surfaces. Simulations are then run to predict the outcome of matches based on the parameters described above. These will allow us to determine the "keys of the match." The outcomes of the simulations will be compared to the probabilities generated from Markov processes. (Received June 22, 2016)