Harmonic complex tones such as human voice, animal vocalizations and most musical sounds evoke a strong pitch sensation at the frequency of their fundamental Fourier component. Changes in pitch play an important role in music, speaker identification, and convey emotions in spoken language. Differences in pitch favor segregation of sounds into separate auditory objects, while sound components sharing a common fundamental tend to be grouped into a single object. Despite the perceptual importance of pitch, the neural mechanisms for pitch processing remain poorly understood. In this poster presentation, we examine two ways pitch could be represented in the responses of peripheral auditory neurons, and discuss the fate of these representations at more central stages of processing. We argue that neither a rate-place representation of pitch based on the frequency selectivity and frequency-to-place mapping in the cochlea, nor a purely temporal representation based on neural phase locking and interspike interval distributions provide entirely satisfactory accounts of pitch perception. We discuss an alternative spatio-temporal model for pitch extraction that combines some of the advantages of place and temporal representations.