MULTIPLE GAPS

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A multiple gap consists of finitely many hereditary families of subsets of $\mathbb{N}$ which are orthogonal but cannot be separated. We shall present a Ramsey theory for analytic multiple gaps. We shall see how this theory implies deep general principles about finding subsequences of a sequence where certain classes are either *separated* or *not separated*. Two classes $\mathcal{C}$ and $\mathcal{C}'$ of sequences are separated in the sequence $\{x_n : n \in \mathbb{N}\}$ if $\mathbb{N} = A \cup B$ so that $\{x_n : n \in A\}$ contains no subsequence from $\mathcal{C}$, and $\{x_n : n \in B\}$ contains no subsequence from $\mathcal{C}'$. We shall discuss applications to basic sequences in Banach spaces and to the topology of $\beta\mathbb{N} \setminus \mathbb{N}$.

Joint work with Stevo Todorcevic.