Recall that, given a graph $G$, the matrix $Q = D + A$ is called the signless Laplacian, where $A$ is the adjacency matrix and $D$ is the diagonal matrix of vertex degrees. The matrix $L = D - A$ is known as the Laplacian of $G$.

Graphs with the same spectrum of an associated matrix $M$ are called cospectral graphs with respect to $M$, or $M$-cospectral graphs. A graph $H$ cospectral with a graph $G$, but not isomorphic to $G$, is called a cospectral mate of $G$. Let $\mathcal{G}$ be a finite set of graphs, and let $\mathcal{G}'$ be the set of graphs in $\mathcal{G}$ which have a cospectral mate in $\mathcal{G}$ with respect to $M$. The ratio $|\mathcal{G}'|/|\mathcal{G}|$ is called the spectral uncertainty of (graphs from) $\mathcal{G}$ with respect to $M$.

The papers [15], [16] provide spectral uncertainties $r_n$ with respect to the adjacency matrix $A$, $s_n$ with respect to the Laplacian $L$ and $q_n$ with respect to the signless Laplacian $Q$ of sets of all graphs on $n$ vertices for $n \leq 11$: the numbers $q_n$ are smaller than the numbers $r_n$ and $s_n$ for $n \geq 7$. This was a strong basis for believing that studying graphs by $Q$-spectra is more efficient than studying them by other spectra.

This idea was accepted in [19] where it was also noted that almost no results in the literature on the spectra of signless Laplacian existed at that time. Moreover, connection with spectra of line graphs and the existence of a well developed theory of graphs with least eigenvalue $-2$ were used as additional arguments for studying eigenvalues of the signless Laplacian.

Next step was the paper [22] where known results were surveyed together with presentation of some new results. This paper was cited in almost all subsequent papers on the subject.

An important role in attracting many researchers played the paper [23] where thirty computer generated conjectures have been published.

Once the number of papers on the subject started to grow substantially, my colleague S. Simić and I decided to classify old and new knowledge and to sketch a theory on the signless Laplacian eigenvalues. We published the papers [41], [67], [68] with the common title "Towards a spectral theory of graphs based on the signless Laplacian".

Papers on signless Laplacian eigenvalues are continuously being published. By the end of 2010 their number has reached one hundred as the following bibliography shows.
References

Before 2002


2002


2003


2004


2005


2006


2007


2008


2009


2010


**In process of publication**


