Anne Bennett Prize: citation for Asma Hassannezhad

Short citation:

Dr Asma Hassannezhad of the University of Bristol is awarded an Anne Bennett Prize for her outstanding work in spectral geometry and her substantial contributions toward the advancement of women in mathematics.

Long citation:

Dr Asma Hassannezhad of the University of Bristol is awarded an Anne Bennett Prize for her outstanding work in spectral geometry and her substantial contributions toward the advancement of women in mathematics. Dr Hassannazhed has emerged as a leading figure in spectral theory and the geometric analysis of elliptic differential operators, with connections to differential geometry, spectral theory of discrete elliptic operators on graphs, and probability theory.

Dr Hassannezhad has proved a wide range of important and beautiful results relating the spectrum of elliptic differential operators on manifolds to the geometry of the manifold. These include upper bounds for eigenvalues of the Laplace and Schrödinger operators in terms of a new conformal invariant and bounds for Steklov eigenvalues on manifolds and orbifolds with boundary. She is well known for her results giving upper bounds on Laplace eigenvalues on closed manifolds that are asymptotically consistent with Weyl's law up to a constant depending only on the dimension of the manifold, and asymptotically sharp bounds for Steklov eigenvalues. Her results have introduced novel ideas to the field, such as the min-conformal volume that she defined to obtain upper bounds on eigenvalues, and Cheeger-type isoperimetric constants that she studied in joint work with Miclo to obtain lower bound for higher-order Steklov eigenvalues in both continuous and discrete settings.

In addition to her outstanding research achievements, Dr. Hassannezhad has co-organised high-profile international workshops and conferences in her field, including a couple of ‘Young Women in…’ conferences in Bonn. Dr. Hassannezhad is active in supervising and mentoring women in mathematics. Her dedication to the case of demonstrating the role of women in the highest echelons of pure research is also shown by invitations to workshops promoting research collaborations between women in Mathematics, and events celebrating the International Day of Women in Mathematics at Sharif University of Technology (2019) and at Dartmouth College (2020).