

## Special Program 2009/10 " Analytic Number Theory "

The program focused on number theory and especially on analytic techniques. A number of the themes that were highlighted and developed during that year have gelled over the last decade. For example the developments around Pila's extension with Wilkie, of the Bombieri/Pila method coupled with theory of o-minimal structures has since led to the resolution of a number of long standing problems. These include the proof of the Andre-Oort conjecture for the space of principally polarized abelian varieties by Pila and Tsimerman (2014/15) and the proof by Bakker, Bruenarbe and Tsimerman (2019) of the 1970 Conjecture of Griffiths concerning the algebraicity of the images of period maps in period domains. The theory of subconvexity of L functions with applications to diophantine analysis which was already quite active during the special program, continues to be one of the central and most active areas of research in the theory of L-functions. Many far reaching arithmetic equidistribution problems have been established in the number field and function field setting. Two examples of results in the function field setting are those of Ellenberg- Venkatesh and Westerland establishing the Cohen-Lenstra heuristics for class groups (2016) and the recent work of Schusterman and Sawin proving the Chowla Conjecture in the function field context. Most of the researchers above mentioned were involved in the special program.