Francesco Bastianelli

(University of Roma Tre)

On large theta-characteristics with prescribed vanishing

Let $\mathcal{M}_g^r$ be the locus in $\mathcal{M}_g$ described by smooth curves C admitting a theta-characteristic L such that $h^0(C,L) \geq r+1$ and $h^0(C,L) \equiv r+1 \pmod 2$. These loci have been introduced by Harris, who proved a sharp bound on their codimension. Besides, Kontsevich and Zorich investigated theta-characteristics depending on the vanishing of global sections. I shall present a joint work with E. Ballico and L. Benzo, where we consider both the viewpoints above at once. Namely, given a sequence of positive integers $\underline{k} = (k_1, \ldots, k_n)$ with $\sum_i k_i = g-1$, we study the loci $\mathcal{G}_g^r(\underline{k})$ in $\mathcal{M}_{g,n}$ parameterizing n-pointed curves $(C, p_1, \ldots, p_n)$ such that $L := \mathcal{O}_C\left(\sum_i k_i p_i\right)$ is a theta-characteristic as above. We achieve a general upper bound governing the codimension of $\mathcal{G}_g^r(\underline{k})$ in $\mathcal{M}_{g,n}$. Moreover, we prove that when the genus g is large enough, any $\mathcal{G}_g^r(\underline{k})$ has an irreducible component of maximal codimension, so that our bound turns out to be sharp.