Numerical properties of lattice polytopes.

In our talk we address properties of numerical invariants of a lattice polytope $P$ and its dilations. These include $\mu_{idp}$ - the smallest number such that $nP$ is normal for $n \geq \mu_{idp}$ and $\mu_{Hilb}$, the highest degree of the Hilbert basis element of the cone over $P$.

There are well-known inequalities among such invariants, e.g. $\mu_{idp} \leq \dim P - 1$. In our talk, we would like to present results with number theoretic flavor. For example, there exists a polytope $P$ with $\mu_{Hilb} = n$ and $\mu_{idp} = 2$ if and only if $n$ is a prime number.

We present a construction, through lattice segmental fibrations due to Beck, Delgado and Gubeladze, that allows to present polytopes with very special numerical properties. In particular, we answer several open questions concerning $\mu_{idp}$ of very ample polytopes and their gap vectors. These results are from a joint work with Michał Lasoń. (Received August 22, 2014)