SHABNAM AKHTARI, University of Oregon
The difficulty of proving effective results for norm form equations.

Let $\omega_1, \ldots, \omega_n$ be algebraic numbers that are linearly independent over the rationals, and let $k = \mathbb{Q}(\omega_1, \ldots, \omega_n)$. We define a homogeneous polynomial in n variables $x_1, \ldots, x_n$ by $N(\mathbf{x}) = \mathrm{Norm}_{k/\mathbb{Q}}(x_1\omega_1 + \ldots + x_n\omega_n)$. We are interested in the points $\xi \in \mathbb{Z}^{\mathbf{n}}$ that satisfy $N(\mathbf{x}) = \beta$, for a fixed non-zero $\beta \in \mathbb{Q}$. In a breakthrough work, Wolfgang Schmidt used his celebrated subspace theorem to give some bounds on the number of families of integer solutions to norm form equations. We are interested in finding some effective bounds for the representatives of integral solutions of norm form equations. I will try to explain the difficulty of obtaining such results and will report on some partial progress that we have made in this direction. This is a joint work in progress with Jeff Vaaler.