1145-11-1483 **Matt Larson*** (`matthew.larson@yale.edu`), **Sam Payne** and **Alan Stapledon**. *Local h polynomials and the monodromy conjecture.*

For a polynomial $f \in \mathbb{Z}[x_1, x_2, \ldots, x_n]$ and a prime p, we define the local zeta function $Z_f(s)$ as the integral of $|f|^s$ over $\mathbb{Z}_p^n$. Igusa's monodromy conjecture predicts that the singularities of f control the poles of $Z_f(s)$. More precisely, if p is a pole of $Z_f(s)$, then $\exp(2\pi i \mathrm{Re}(p))$ is an eigenvalue of the monodromy transformation of the Milnor fibration at some point in the singular locus of f.

Assuming f is Newton nondegenerate, both the poles and eigenvalues have combinatorial formulas in terms of the Newton polyhedron of f. To each facet of the Newton polyhedron, one naturally associates both a candidate pole p and a contribution to the multiplicity of $\exp(2\pi i \mathrm{Re}(p))$ as an eigenvalue of monodromy. The contribution to this multiplicity is the value at 1 of a combinatorially defined polynomial, which is a relative version of Stanley's local h polynomial. By studying combinatorial conditions that are necessary for the vanishing of these relative local h-polynomials, we prove several new cases of Igusa's monodromy conjecture. (Received September 22, 2018)