Boundary blow-up solutions to degenerate elliptic equations with non-monotone inhomogeneous terms

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In this talk we discuss the existence of a solution $u \in C(\Omega)$ to the boundary value problem

$$\Delta_\infty u = h(x,u), \quad (x \in \Omega), \qquad u(x) \to \infty \quad \text{as} \quad \operatorname{dist}(x, \partial\Omega) \to 0.$$

Here, $\Delta_\infty u = \langle D^2 u\, Du\,,\, Du \rangle$ is the infinity-Laplacian, $\Omega \subseteq \mathbb{R}^n$ is a bounded domain, and $h : \overline{\Omega} \times \mathbb{R} \to [0, \infty)$ is a non-trivial, continuous function with $h(x, 0) \equiv 0$ on Ω. This type of problems have been investigated extensively when the operator Δ_∞ is replaced by the Laplacian (more generally, the p-Laplacian), and the Monge-Ampère (more generally, the k-Hessian operator). In most of these studies, the inhomogeneous term is assumed to be of the form $h(x,t) = b(x)f(u)$, with f non-decreasing. This is a joint work with Seid Mohammed of Addis Ababa University.