

# GRADIENT ESTIMATES FOR NONLINEAR ELLIPTIC EQUATIONS WITH A GRADIENT TERM

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ABSTRACT. Let  $N \geq 2$  and  $\Omega \subseteq \mathbb{R}^N$  denote a domain containing the origin 0. In this talk, we present recent gradient estimates for the positive solutions  $u \in C^2(\Omega \setminus \{0\})$  of nonlinear elliptic equations such as

$$\operatorname{div}(|x|^\sigma |\nabla u|^{p-2} \nabla u) = |x|^{-\tau} u^q |\nabla u|^m \quad \text{in } \Omega \setminus \{0\}.$$

We assume throughout that  $m, p, q, \sigma$  and  $\tau$  are real parameters satisfying  $1 < p \leq N + \sigma$  and  $\min\{k, \ell, m, q\} > 0$ , where  $k := m + q - p + 1$  and  $\ell := q + 1 - \sigma - \tau$ . This is joint work with Joshua Ching (The University of Sydney).

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