

EINLADUNG
zum Mathematischen Forschungskolloquium mit

Prof. Dr. Lars Diening
Universität Bielefeld (NRW)

am **10.12.2018** um **13:00 Uhr** im HS 228 (Ulmenstr. 69, Haus 3).

**”Higher Regularity of the p -Poisson Equation in the Plane
(Joint work with Anna Kh. Balci, Markus Weimar)”**

Abstract:

In recent years it has been discovered that also non-linear, degenerate equations like the p -Poisson equation

$$-\operatorname{div}(A(\nabla u)) = -\operatorname{div}(|\nabla u|^{p-2}\nabla u) = -\operatorname{div}F$$

allow for optimal regularity. This equation has similarities to the one of power-law fluids. In particular, the non-linear mapping $F \mapsto A(\nabla u)$ satisfies surprisingly the linear, optimal estimate $\|A(\nabla u)\|_X \leq c\|F\|_X$ for several choices of spaces X . In particular, this estimate holds for Lebesgue spaces L^q (with $q \geq p'$), spaces of bounded mean oscillations and Hölder spaces $C^{0,\alpha}$ (for some $\alpha > 0$).

In this talk we show that we can extend this theory to Sobolev and Besov spaces of (almost) one derivative. Our result are restricted to the case of the plane, since we use complex analysis in our proof. Moreover, we are restricted to the super-linear case $p \geq 2$, since the result fails $p < 2$.

Kolloquiumsleiter: Prof. Dr. P. Takáč, Ph.D.