

**Title:** Lipschitz functions with prescribed blowups at many points.

**Abstract:** In 1991, Alberti proved the following “Lusin type theorem for gradients”. Given a Borel vector field  $f$  on  $\mathbb{R}^n$  and  $\varepsilon > 0$ , there exists a closed set  $C \subset \mathbb{R}^n$  and a  $C^1$  map  $g : \mathbb{R}^n \rightarrow \mathbb{R}$  such that  $f = Dg$  on  $C$  and  $|\mathbb{R}^n \setminus C| < \varepsilon$ , where  $|\cdot|$  denotes the Lebesgue measure.

I will discuss the possibility to extend and actually to improve such result, when the Lebesgue measure is replaced by an arbitrary Radon measure  $\mu$ . It turns out that it is still possible to find a  $C^1$  map with prescribed differential at many points (with respect to  $\mu$ ). Moreover, unless  $\mu$  is absolutely continuous, it is also possible to find a Lipschitz function admitting at many points some prescribed non-linear blowups.

This is joint work with Andrea Schioppa (ETH Zuerich).