

Title of my talk: On the prescribed Jacobian equation  $\det \nabla \varphi = f$ : old and new.

Abstract: In this talk I will present the prescribed Jacobian equation  $\det \nabla \varphi = f$  coupled with a Dirichlet condition, namely

$$\begin{cases} \det \nabla \varphi = f & \text{in } \Omega \\ \varphi = \text{id} & \text{on } \partial\Omega \end{cases}$$

where  $\Omega \subset \mathbb{R}^n$  is a smooth connected bounded set of  $\mathbb{R}^n$ ,  $f : \overline{\Omega} \rightarrow \mathbb{R}$  and  $\varphi = (\varphi^1, \dots, \varphi^n) : \overline{\Omega} \rightarrow \mathbb{R}^n$  is the unknown.

I will first motivate the problem, give its main features and provide some historical facts. Then I will present several of my results on this equation and give a few important open problems.