Geometry beyond limits

Abstract: In my lecture I will present problems involving the p-Laplace operator $\Delta_p v = \text{div}(|\nabla v|^{p-2}\nabla v)$ and its limits as $p \in (1, \infty)$ tends to 1 or ∞. The first problem is a free boundary problem involving a Bernoulli-type overdetermined boundary condition. The second problem is the p-Laplacian eigenvalue problem, in which the Rayleigh quotient $R(v) = ||\nabla v||_p / ||v||_p$ is minimized on $W_0^{1,p}(\Omega)$. The limit problems lead to geometric variational problems such as the problem of finding a subset D of Ω (the so-called Cheeger set) which minimizes perimeter over volume among all subsets.

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