1145-35-2032 **Amir Moradifam*** (amirm@ucr.edu). *Existence and structure of minimizers of least gradient problems.*

I will talk about existence of minimizers of the general least gradient problem

$$\inf_{u\in BV_f}\int_{\Omega}\varphi(x,Du),$$

where $BV_f=\{u\in BV(\Omega):\quad u|_{\partial\Omega}=f\}$, $f\in L^1(\partial\Omega)$, and $\varphi(x,\xi)$ is convex, continuous, and homogeneous function of degree 1 with respect to the ξ variable. We will show that there exists a divergence free vector field $T\in(L^\infty(\Omega))^n$ that determines the structure of level sets of all (possible) minimizers, i.e. T determines $\frac{Du}{|Du|}$, $|Du|-$ a.e. in Ω, for all minimizers u. We also prove that every minimizer of the above least gradient problem is also a minimizer of

$$\inf_{u\in\mathcal{A}_f}\int_{R^n}\varphi(x,Du),$$

where $\mathcal{A}_f=\{v\in BV(R^n):\quad v=f\quad\text{on}\quad\Omega^c\}$ and $f\in W^{1,1}(R^n)$ is a compactly supported extension of $f\in L^1(\partial\Omega)$, and show that T also determines the structure of level sets of all minimizers of the latter problem. This relationship between minimizers of the above two least gradient problems could be exploited to obtain information about existence and structure of minimizers of the former problem from that of the latter, which always exist. (Received September 24, 2018)