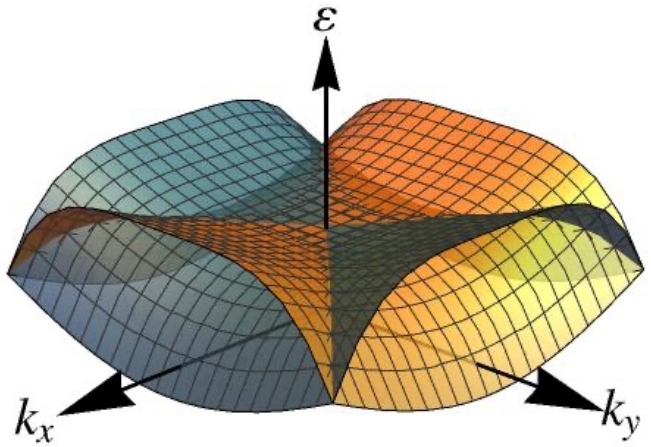
Zoo of higher order singularities in the Ruthenates

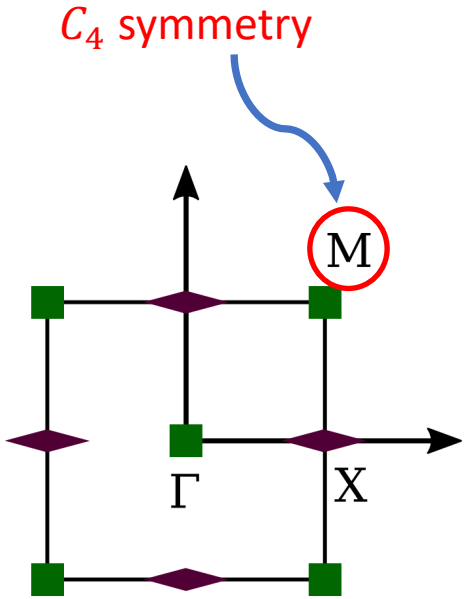
Anirudh Chandrasekaran

Loughborough University

Sr_2RuO_4 surface

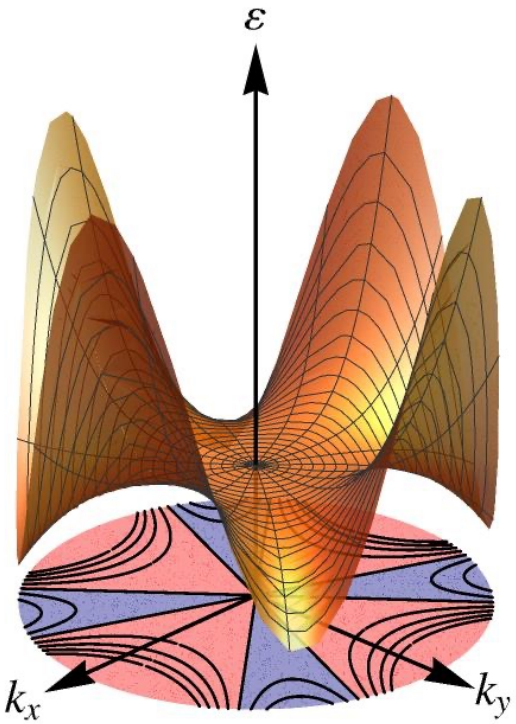


$\approx k_x^4 - k_y^2$ and $k_y^4 - k_x^2$



BZ

$Sr_3Ru_2O_7$ bulk



$\approx k^4 (\cos\eta + \cos(4\varphi - \theta_0))$

$$\nu(\epsilon) = \begin{cases} |\epsilon|^{-\frac{1}{4}}, & \epsilon > 0 \\ \sqrt{2}\,|\epsilon|^{-\frac{1}{4}}, & \epsilon < 0 \end{cases}$$

Universal ratio of pre-factors

Power-law DOS

$$\nu(\epsilon) = \begin{cases} |\epsilon|^{-\frac{1}{2}}, & \epsilon > 0 \\ D(\eta)\,|\epsilon|^{-\frac{1}{2}}, & \epsilon < 0 \end{cases}$$

η measures particle-hole asymmetry
Non-zero θ_0 breaks $k_x \leftrightarrow k_y$ reflection