

1 Morning class week 3 day 3: Electron waves

1. Understanding contour maps:

- (a) Please draw a qualitatively correct contour map of Ayers Rock, the big red rock in Australia, see below.



Figure 1: Sideview Ayers Rock, Australia



Figure 2: Top view Ayers Rock, Australia

- (b) Please draw Ithaca as a contour map. Include in your picture, Cayuga Lake and the three hills which make up Ithaca (South, East and West Hills).



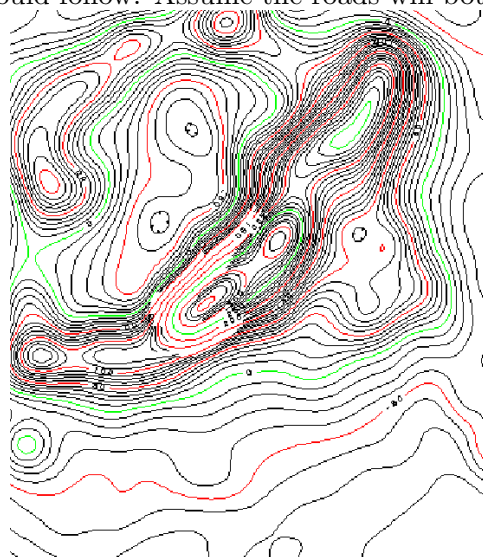
Figure 3: Aerial view of Ithaca

- (c) Please draw Niigata Island, Japan as a contour map, see next page.
- (d) You have been given the project of building two roads passing through the mountain range below. One road will run roughly from the southwest to the northeast while the other will run from the southeast to the northwest. Indicate an intelligent path both



Figure 4: Niigata Island, Japan

these two roads should follow. Assume the roads will both pass through the mountains.



- (e) We use regular lines for positive altitudes and dotted lines for negative altitudes. Make a quick sketch of a mountain next to a depression, both surrounded by a plain.

2. Drawing electron waves as contour maps

- (a) Please draw a contour map for the $1s$ orbital presented in class
- (b) Please draw a contour map for the $2s$ orbital presented in class
- (c) Please draw a contour map for the $3s$ orbital presented in class
- (d) Please draw a contour map for the $2p$ orbital presented in class
- (e) Please draw a contour map for the $3p$ orbital presented in class
- (f) Please draw a contour map for the $3d$ orbital presented in class