**ESS 431 PRINCIPLES OF GLACIOLOGY**

**ESS 505 THE CRYOSPHERE**

**Lecture 05 – Snow: Deposition, wind transport, metamorphism, physical properties**

*Due Wednesday, October 10 2018, at start of class*

|  |
| --- |
| *The Avalanche Handbook*, pp. 52-72 (2006 edition).Marshall, S., 2012. *The Cryosphere.*Chapter 4, pp. 72–89. |

1. What is Inuktitut?
2. Describe depth hoar. Under what snow-pack conditions does it form?
3. Does snow melt first at the contact between snow-grain and pore space, or at grain-grain contacts? Why?
4. During constructive metamorphism, what is generally the dominant processes for vapor-pressure gradient magnitude: temperature variation or grain curvature?

*Vapor pressure is a useful concept for understanding how and why particles leave condensed phases to enter a vapor. When the ambient (environmental) pressure is less than the vapor pressure, molecules tend to escape the liquid or solid, and enter the gas. Vapor pressure changes as a function of temperature, as defined by the Clausius-Clayperon relationship (see Marshall). With that in mind, sketch the following (no need to be use numbers, just show trends – the goal here it to build physical intuition and understanding rather than simply prescribe a formula to follow during quantitative calculations).*

1. Draw a curve representing atmospheric pressure as a function of elevation. Now, add two points (at fixed elevation) for a sample high temperature and low temperature vapor pressure for water. What intuition does this provide for the boiling temperature of water, as a function of elevation? Do you expect H20 molecules to move from warm snow to cold snow, or vice-versa?