Department of Materials Science and Engineering
Massachusetts Institute of Technology
3.14/3.40 Physical Metallurgy – Fall 2009

Review Assignment #2

Due Monday, November 16, 2009

Four recent research articles have been made available on the course website:

Group A: Experimentally-oriented articles:

1. Field et al., "The role of annealing twins during recrystallization of Cu", Acta Materialia, v55 p4233, 2007

2. Zhang et al., "Analysis of the growth of individual grains during recrystallization in pure nickel", Acta Materialia, v57, p2631, 2009

Group B: Simulation-oriented articles:

3. Ivasishin et al., "Implementation of exact grain-boundary geometry into a 3-D Monte-Carlo (Potts) model for microstructure evolution", Acta Materialia, v57, p2834, 2000

4. Lim et al., "Low-angle grain boundary migration in the presence of extrinsic dislocations", Acta Materialia, v57, p5013, 2009

3.14 students: Select one article from the above four, submit one document

3.40 students: Select one article from each of the two groups, A & B, submit two documents

After selecting an article, read it carefully, and think critically about what you have read. You will then prepare a short review of the article, in about 2 pages. About the first third of your review should be a synopsis of the paper, inclusive of methods and main results. The remainder of the review should ***offer a critique*** of the paper, and present some creative thoughts for future questions to be addressed. For example, some things to discuss may include:

• Does anything in this paper contradict the "textbook" knowledge that you are learning in class?
• Alternatively, does this paper significantly add to our understanding of something to the point where we should add this new knowledge to our textbook?
• Are the methods used in the work sufficient to support the conclusions drawn by the authors?
• Is the logic internally consistent? Do all of the data support the same conclusion?
• Can you suggest a better way to resolve one or more of the open questions in this work?
• Is there a simple experiment that can either refute or substantially support the authors' claims?
• How general are the conclusions of this paper; are these results to be expected for other metals or materials?
• What doors does this work open for future research?
• What doors does this work open for industrial development or usage of metals?

3.40J / 22.71J / 3.14 Physical Metallurgy

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