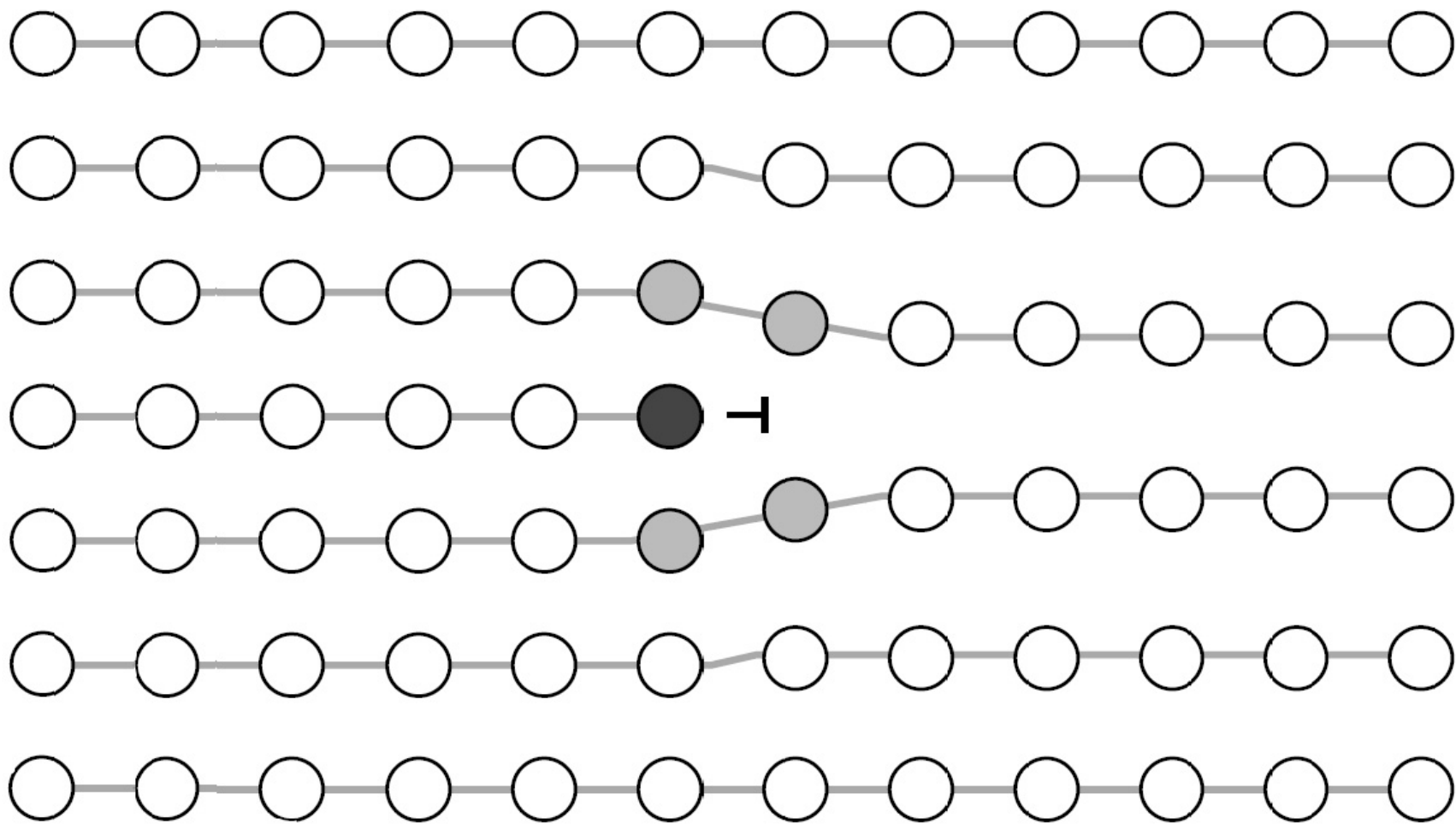


Welcome to 3.091

Lecture 20

October 26, 2009

Line, Interface, & Bulk Defects



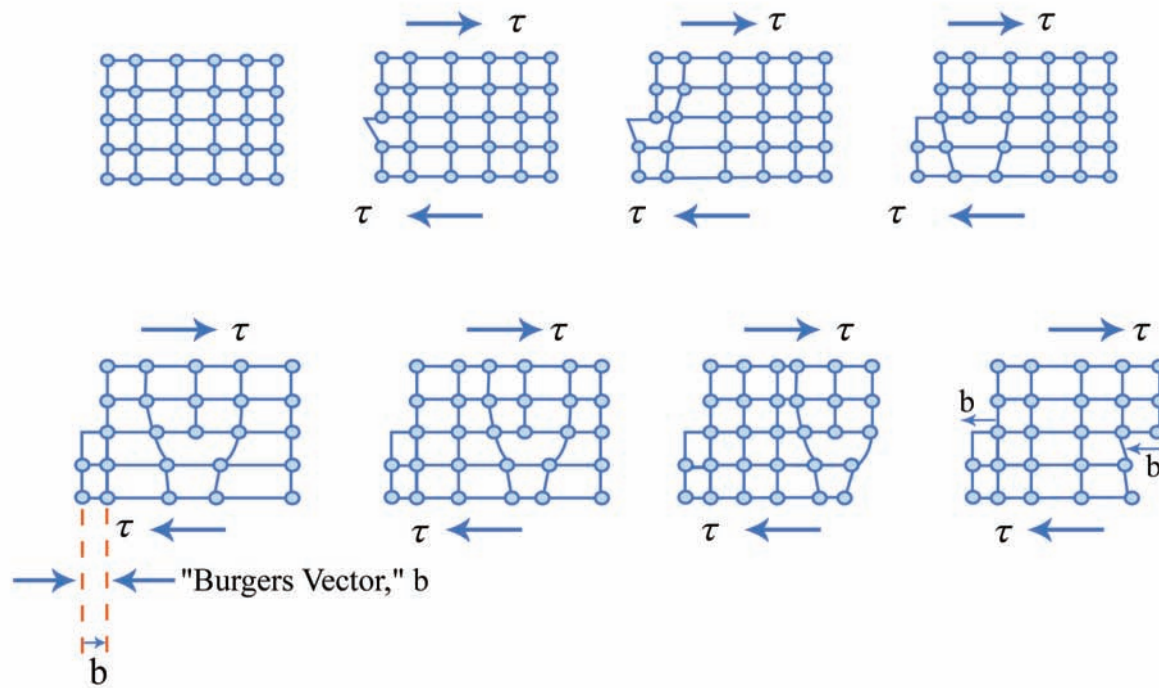


Image by MIT OpenCourseWare. Adapted from Fig. 9.4 in Ashby, M. F., and D. R. H. Jones. Engineering Materials 1. Boston, MA: Elsevier Butterworth-Heinemann, 2005.

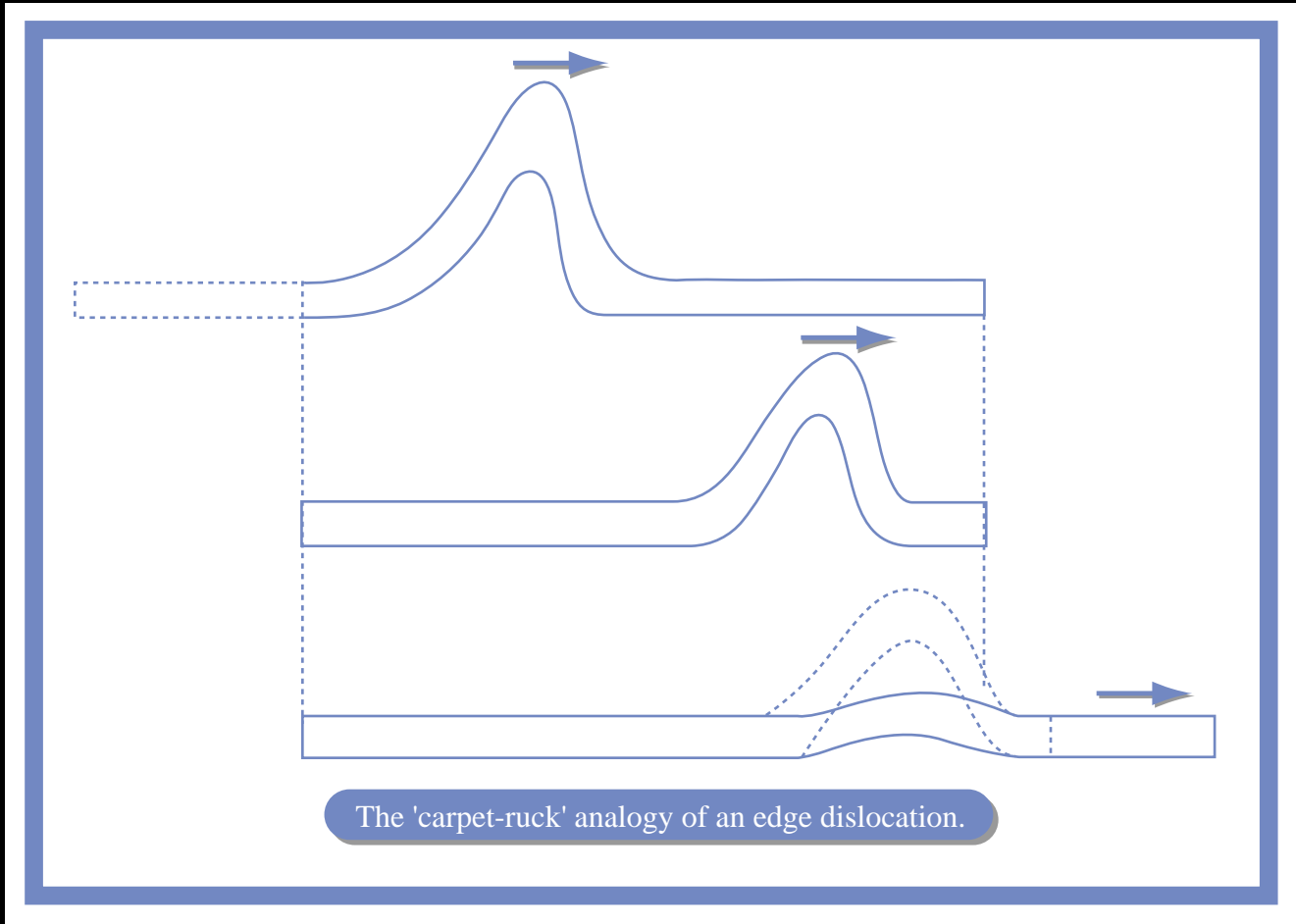


Image by MIT OpenCourseWare. Adapted from Fig. 9.6 in Ashby, M. F., and D. R. H. Jones. Engineering Materials 1. Boston, MA: Elsevier Butterworth-Heinemann, 2005.

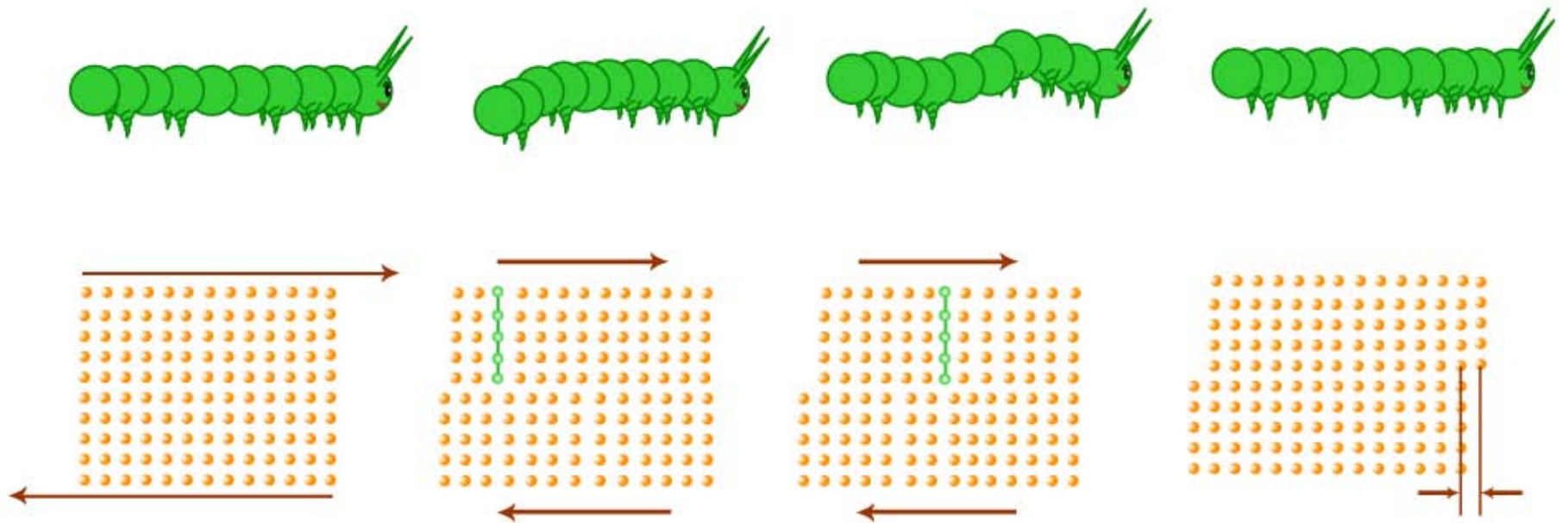
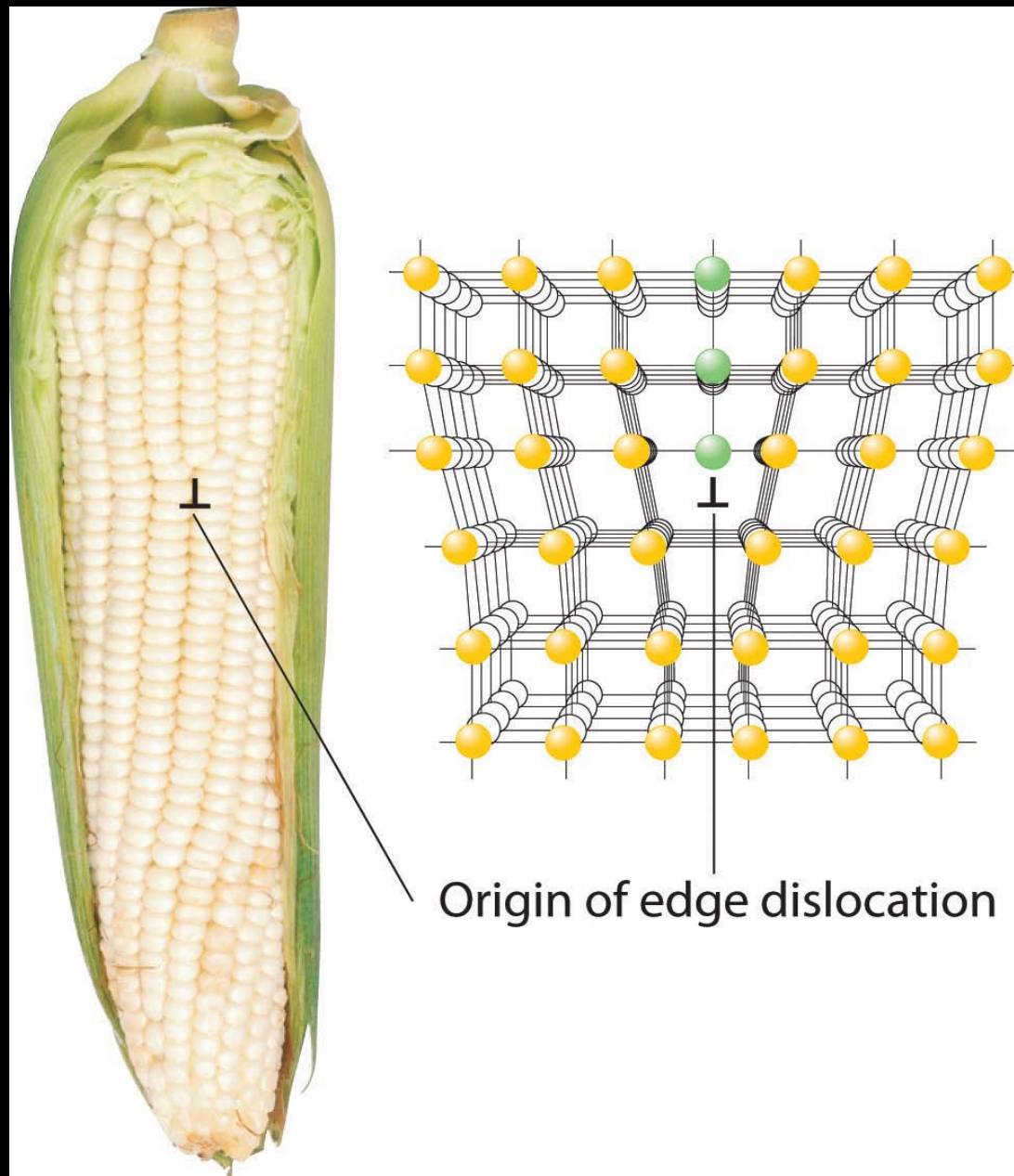


Image by MIT OpenCourseWare.



Origin of edge dislocation

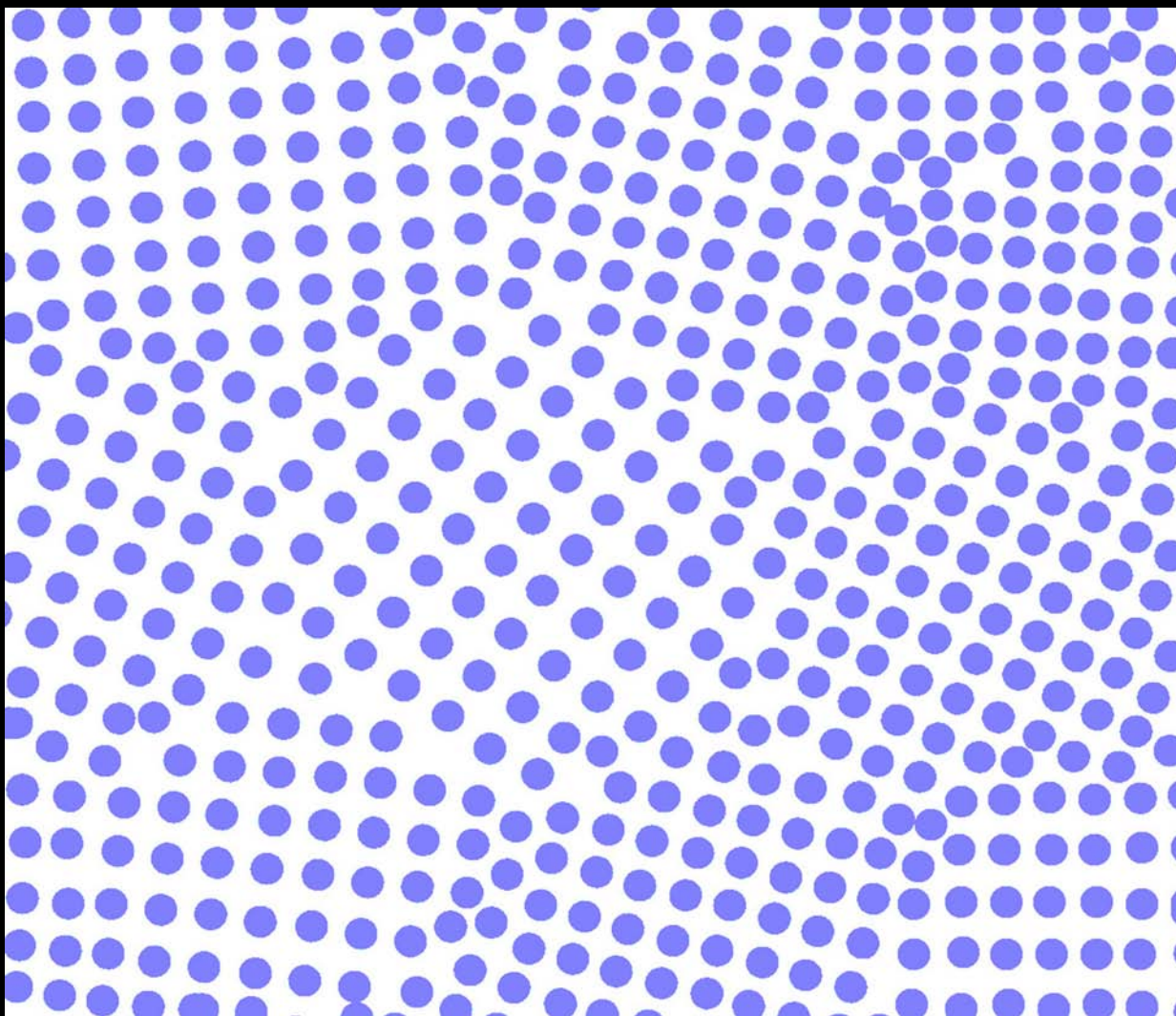
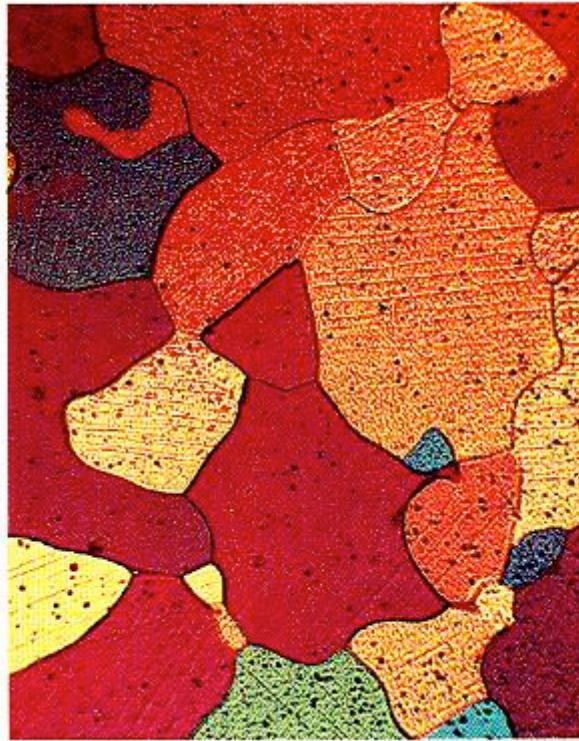
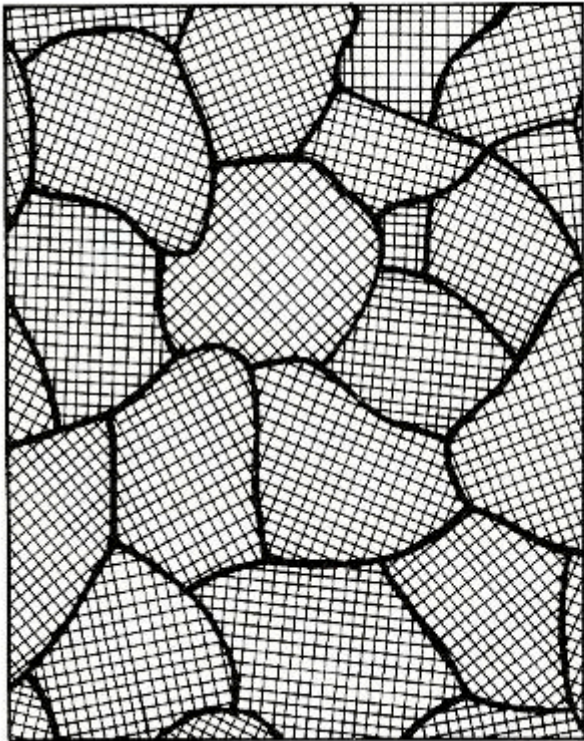


Image by [Edward Pleshakov](#) on Wikipedia.

polycrystalline Cu

W bicrystal



optical microscope
polarized light

field ion
microscope

crystal structure	CN	close packed direction	highest density plane	close packed plane
FCC	12	$\langle 011 \rangle$	$\{111\}$	yes
BCC	8	$\langle 111 \rangle$	$\{011\}$	no
SC	6	$\langle 001 \rangle$	$\{001\}$	no

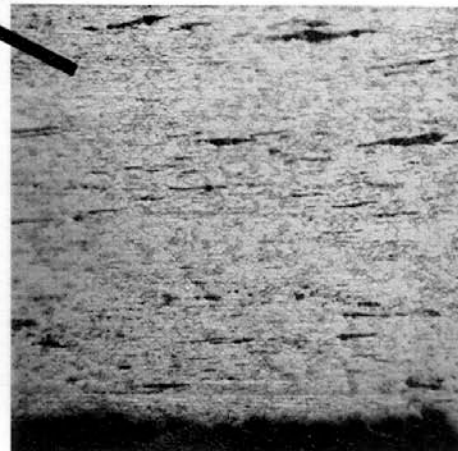
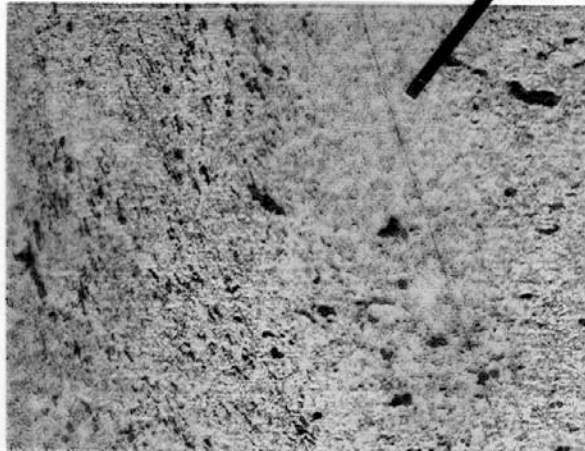
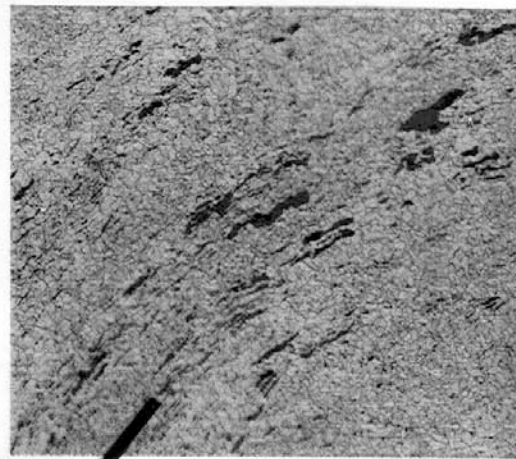
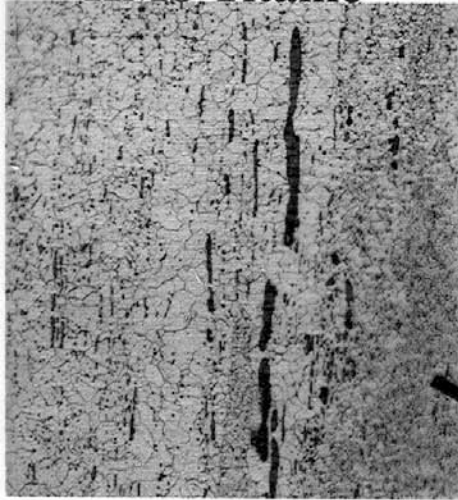
**Rivet
from
HMS Titanic**



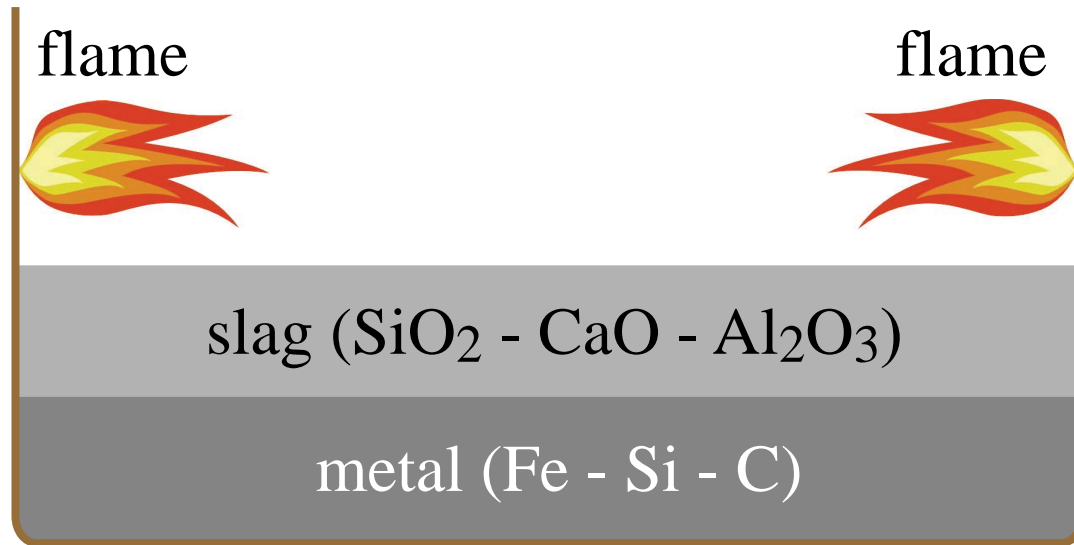
**Tim Foecke,
NIST**



**Microstructure of
Rivet from
HMS Titanic**



Open Hearth Steelmaking (Siemens)



life out of balance

Photo from [Koyaanisqatsi](#) removed due to copyright restrictions.

musical score by Philip Glass

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3.091SC Introduction to Solid State Chemistry
Fall 2009

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