Readings for G777 – Spring 2012

For every week's class there are supplemental articles, which everyone is required to read. Starting with Week 5, students will be responsible for leading a discussions based on the reading material. I ask that each person pick 5 papers from the list marked **, and rank order preferred (1 most preferred, 5 least). I will select one for each person using the list as a filter. There is a wide range of page lengths, and I will try to balance this so no one gets "too short" an article. **Questions from article will be included on the weekly quizes. And once I have picked the papers students will be responsible for, a revised listing which everyone is responsible for reading, will be distributed.**

The articles should all be available on the 777 web page. There most are sorted by journal, so first go to the journal heading.

Please turn in your list next week (January 31 class).

Week 2

Chapman 1999 Optimizing the performance of a tungsten hairpin SEM: *Scanning Microscopy*, Vol 13, p. 141-146

Buonaquisti 1993 If you hate vacuum systems, read on; and Why pressure scales cause so much confusion: *Microscopy Today*, February and December (2 pp) **[everyone read]**

Week 3 EDS

Lund 1994-95 More than one ever wanted to know about x-ray detectors: Part 1-First in series; Part 2-Settling the question of detector warming; Part 3-Who put Pm in my soup?; Part 4-Windows for elements heavy and light; *Microscopy Today*, 3 pp. **[everyone read all]**

**Kenik 2011 (May) Evaluating the performance of a commercial silicon drift detector for X-ray microanalysis. *Microscopy Today*, p. 40-46.

Week 4 EDS spectral simulation
[everyone read all]

Ritchie 2011 (January) Getting started with NIST DTSA-II. *Microscopy Today*, p. 26-31.

Ritchie 2011 (May) Manipulating spectra with DTSA-II. *Microscopy Today,* p. 34-39

Ritchie 2011 (September) Standards-based quantification in DTSA-II, Part I. *Microscopy Today*, p. 30-36.

Ritchie 2012 (January) Standards-based quantification in DTSA-II, Part II. *Microscopy Today*, p. 24-28.

Week 5 VPSEM and Low Voltage SEM

**Newbury 2002 X-ray microanalysis in the VP-SEM, *J. of Research of NIST*, vol. 107, p. 567-603.

**Newbury 2002 Barriers to quantitative electron probe x-ray microanalysis for low voltage SEM, *J. of Research of NIST,* v. 107, p. 605-619.

Week 6 Advanced SEM and EDS

**Newbury 2005 Misidentification of major constituents by automatic qualitative EDS, Microscopy and Microanalysis, Vol 11, p. 545-561 and the Response and rebuttal: Burgess and Newbury: *Microscopy & Microanalysis* vol 12, p. 281-284.

**Watt et al 2000 Charge contrast imaging in geological materials in ESEM, *American Mineralogist*, vol. 85, p. 1784-1794.

**Cuthbert and Buckman 2005 Charge contrast imaging of fine-scale microstructure and compositional variation in garnet using the ESEM, *American Mineralogist*, vol. 90, p. 701-707

Week 7 WDS Part 1

Lund 1995 Part 5-Wavelength, the "other" spectroscopy; *Microscopy Today*, 1 pp. **[everyone read]**

Week 8 (WDS Part 2)

**Anderson 1967 The quality of x-ray microanalysis in the ultra-soft x-ray region, *Brit. J. Appl. Phys*., 18, p 1033-1043.

Week 9 Matrix Correction

**Joy 2001 Fundamental constants for quantitative X-ray microanalysis, *Microscopy and Microanalysis*, vol 7, p. 159-167

**Kyser 1972 Experimental determination of mass absorption coefficients for soft x-rays, *Proc. 6th Intl Conf on X-ray Optics & Microanalysis*, p. 147-156

Week 10 Standards; Specimen Preparation

** Wilson et al 2012 (January) A new basaltic glass microanalytical reference material for multiple techniques. *Microscopy Today*, p. 12-16.

**(Package of these following 4 articles on standards:

**Jarosowich 2002 Smithsonian Microbeam Standards, *J. of Research of NIST*, v. 107, p. 681-685

**Carpenter 2008 EPMA standards: the good, the bad and the ugly. *Microscopy & Microanalysis* 14 (Suppl 2), pl 530-531.

**Rose 2008 Smithsonian Microbeam Standards: not just our farher's microprobe standards. *Microscopy & Microanalysis* 14 (Suppl 2), p. 528-529

**Vincenzi and Rose 2008 Hyperspectral X-ray analysis of submicrometer-scale heterogeneities in a venerable compositional standard: Kakanui hornblende. *Microscopy & Microanalysis* 14 (Suppl 2), p. 522-523.

(end package of 4 articles on standards)

**Windsor et al 2002 Copper oxide precipitates in Standard Reference Material 482, *J. of Research of NIST*, v. 107, p. 663-679.

**Remond et al 2002 Implications of polishing techniques in quantitative x-ray microanalysis, *J. of Research of NIST*, v. 107, pl. 639-662.

Week 11 Trace Elements

**Carpenter et al 2002 Characterization of Corning EPMA standard glasses 95IRV, 95IRW, and 95IRX, *J. of Research of NIST*, v. 107, p. 693-701

**Jercinovic et al 2005 Analytical perils (and progress) in electron microprobe trace element analysis applied to geochronology, *American Mineralogist,* vol. 90, p. 526-546.

** Newbury 2009 Mistakes encountered during automatic peak ID of minor and trace constituents in electron-excited EDS microanalysis, *Scanning*, v. 31, p. 91-101.

Week 12 Light Elements; Thin Films and Particles

**Pouchou 1996 Use of soft x-rays in microanalysis. *Mikrochim. Acta [Suppl]* 13, p 39-60.

**Pouchou 1993 X-ray microanalysis of stratified specimens, *Analytica Chimica Acta*, Vol. 283, p. 81-97.

Week 13 Difficult/sensitive materials

** Morgan and London (1996): Optimizing the electron microprobe analysis of hydrous alkali aluminosilicate glasses. *American Mineralogist*, v. 81, p. 1176-1185.

** Stormer et al (1993): Variation of F and Cl X-ray intensity due to anisotropic diffusion in apatite during electron microprobe analysis. *American Mineralogist*, v. 78, p. 641-648 (also appendix)

Week 14 Accuracy and Errors

**Lifshin and Gauvin 2002 Minimizing errors in electron microprobe analysis, *Microscopy and Microanalysis*, Vol. 7, p. 168-177.

**Llovet and Galan (2003) Correction of secondary X-ray fluorescence near grain boundaries in electron microprobe analysis: Application to thermobarometry of spinel lherzolites. *American Mineralogist*, v. 88, p. 121-130.

Week 14 EBSD

**Prior et al (1999) The application of electron backscatter diffraction and orientation contrast imaging in the SEM to textural problems in rocks, *American Mineralogist*, 84, 1741-1759.

**Prior et al (1996) Orientation contrast imaging of microstructures in rocks using forescatter detectors in the SEM, *Mineralogical Magazine*, 60, 859-869.

Other papers up for possible consideration:

Gauvin et al 2006 Win X-ray: A new Monte Carlo program that computes x-ray spectra obtained with a SEM, *Microscopy and Microanalysis* Vol 12, p. 49-64

Lamontagne et al 2007 Microbeam analysis of irradiated materials, *Microscopy and Microanalysis,* Vol 13, p. 150-155.

Kotula et al 2006 Tomographic spectral imaging with multivariate statistical analysis: comprehensive #D microanalysis, *Microscopy and Microanalysis*, Vol. 12, p. 36-48.

Remond et al 2002 Decomposition of wavelength dispersive x-ray spectra, *J of Research of NIST,* Vol 107, p. 509-529.

Humphreys et al (2006), SIMS investigation of electron-beam damage to hydrous, rhyolitic glasses: Implications for melt inclusion analysis. American Mineralogist, 91, 667-679.

Gotze (2002): Potential of cathodoluminescence (CL) microscopy and spectroscopy for the analysis of minerals and materials.*Anal Bioanal Chem*, v. 374, p. 703

Ginibre, Kronz and Worner, 2002, High-resolution quantitative imaging of plagioclase compositions using accumulated BSE images, *Contributions Min Pet*, vol. 142, pp. 436-448

Small 2002 The analysis of particles at low accelerating voltage (<10 kV) with EDS, *J. of Research of NIST*, v. 107, p. 555-566.

And others are listed at
www.geology.wisc.edu/~johnf/g777/777articles.html. If you see something there not listed here, ask me if it might be acceptable.

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