

## **Bibliography of Soft X-ray Microscopy** (UPDATE of supplemental material for Polymer invited review)

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*Composition and orientation probed in real and reciprocal space*, Polymer **49** (2008) 643-67

### Materials

P – polymer; M – material (non-polymer); E – environmental; B - biological

### Types

R – review; I – instrumentation; T – technique; A - application

### Techniques

CXDI – coherent X-ray diffraction imaging

CXRM – contact microscopy

DIXH – Digital in-line X-ray holography

ESCA Microscopy = SPEM (Elettra pub list)

FTH - Fourier transform holography

Nanospectroscopy = XPEEM (Elettra pub list)

PEEM – photoemission electron microscopy

PT - ptycography

RSoXS – resonant Soft X-ray Scattering (extends XRM spatial resolution)

SFXM – scanning focused X-ray microscope

SPAM – scanning photo-excited Auger microscope

SPEM – scanning photoemission X-ray microscopy

SP-STXM – STXM with scanning probe pickup

STXM – scanning transmission X-ray microscopy

TR-PEEM – time resolved PEEM

TXM – full field transmission X-ray microscopy

### Polymer and materials abbreviations

|          |                                                                                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alb, HSA | human serum albumin                                                                                                                                                        |
| ABS      | polybutadiene-acrylonitrile blend                                                                                                                                          |
| DVB55    | divinylbenzene (45% monovinylbenzene)                                                                                                                                      |
| EGDMA    | ethylene glycoldimethylacrylate                                                                                                                                            |
| EVA      | poly (ethylene-co-vinyl alcohol                                                                                                                                            |
| Fg       | fibrinogen                                                                                                                                                                 |
| F8BT     | poly(9,9'-dioctylfluorene-co-benzothiadiazole)                                                                                                                             |
| LDPE     | low density polyethylene                                                                                                                                                   |
| Kraton   | type of rubber                                                                                                                                                             |
| MDI      | merhlyene di(isocyanate)                                                                                                                                                   |
| MMT      | montmorillonite clay                                                                                                                                                       |
| Nylon-6  | poly( $\epsilon$ -caprolacatam)                                                                                                                                            |
| PAR      | polyacrylate                                                                                                                                                               |
| PBMA     | poly-n-butyl-methacrylate                                                                                                                                                  |
| PPrS     | poly-bromo-styrene                                                                                                                                                         |
| PC       | polycarbonate                                                                                                                                                              |
| PET      | poly(ethyleneterephthalate)                                                                                                                                                |
| PMMA     | polymethylmethacrylate                                                                                                                                                     |
| PMGI     | poly dimethylgultarimide                                                                                                                                                   |
| PAA      | polyacrylic acid                                                                                                                                                           |
| PE       | polyethylene                                                                                                                                                               |
| PEP      | poly(ethylene- <i>alt</i> -propylene)                                                                                                                                      |
| PI       | polyisoprene                                                                                                                                                               |
| PLA      | polylactide (polylactic acid)                                                                                                                                              |
| PP       | polypropylene                                                                                                                                                              |
| PP-g-MA  | polypropylene-graft maleic anhydride                                                                                                                                       |
| PPTA     | poly(p-phenylene terphthalamide) = Kevlar <sup>TM</sup>                                                                                                                    |
| PS       | polystyrene                                                                                                                                                                |
| PTMO-ED  | polytetramethylene oxide + ethylenediamine + MDI)                                                                                                                          |
| RBC      | poly[(styrene- <i>r</i> -isoprene)'- <i>b</i> -(styrene- <i>r</i> -isoprene)''], (S/I)'- <i>b</i> -(S/I)'', copolymer; ' = 75/25; '' = 50/50 (wt %) S/I block compositions |
| SEBS     | poly(styrene- <i>b</i> -ethylene butylene- <i>b</i> -styrene)                                                                                                              |
| TDI      | toluene di(isocyanate)                                                                                                                                                     |
| TFB      | poly(9,9-dioctylfluorene-co-N-(4-butylphenyl)diphenylamine)                                                                                                                |
| Vectra   | poly(butylene terephthalate)                                                                                                                                               |

| code     | materials | type | tech      | species                                     | Comments                              |
|----------|-----------|------|-----------|---------------------------------------------|---------------------------------------|
| 1969SR   | M         | I    | TXM       |                                             | First zone plates designed for XRM    |
| 1972HH   | M         | I    | pinhole   |                                             | 2 um resolution (at NSLS)             |
| 1974K    | M         | I    | STXM      |                                             | zone plate theory                     |
| 1976NRS  | M         | I    | TXM       | <i>Eremosphaera viridis</i> ,, cotton fibre | First synchrotron TXM (at DESY)       |
| 1977SK&a | B         | T    | STXM      |                                             | radiation dose (electron vs. X-ray)   |
| 1977SK&b | B         | T    | STXM      |                                             | water window theory                   |
| 1980Ka   | B         | A    | STXM      |                                             | elemental mapping                     |
| 1980Kb   | B         | I    | STXM      |                                             | radiation damage                      |
| 1980KS   | B         | R    | STXM      |                                             | early review of soft X-ray microscopy |
| 1980RK&  | B         | I    | STXM      |                                             | UV ring STXM – first results          |
| 1980SR&  | B         | R    | TXM       |                                             |                                       |
| 1984RK&  | B         | A    | STXM      |                                             | UV ring STXM                          |
| 1985HK&  | B         | R    | STXM, TXM |                                             | popular review                        |
| 1985KR   | B         | I, R | STXM      |                                             | first NSLS microscope                 |
| 1986JK&  | B         | I    | STXM      |                                             | U15 BM STXM                           |
| 1986RS&  | B         | I    | STXM      |                                             | plans for X1A STXM                    |
| 1987JK   | B         | R    | STXM      |                                             |                                       |
| 1987YH   | M         | I    | STXM      |                                             | zone plate theory                     |
| 1988DH&  | P         | A, T | RSoXS     | sulphonated PS                              | resonant scattering                   |
| 1988RS&a | B         | I    | STXM      |                                             | first X1A result (?)                  |
| 1988RS&b | B         | I    | STXM      |                                             | UV ring STXM                          |
| 1988SS&  | M         | I    | STXM      |                                             | interferometer encoder for STXM       |
| 1988YH   | M         | I    | STXM      |                                             | ZP fabrication                        |
| 1989BR&  | B         | I    | STXM      |                                             |                                       |
| 1989RI&  | B         | A    | STXM      | zymogen granules                            |                                       |
| 1990AK&  | P         | I    | STXM      |                                             |                                       |
| 1990KA&  | B         | R    | STXM      |                                             |                                       |
| 1990RA&  | B         | R    | STXM      |                                             |                                       |
| 1990RB&  | M         | I    | STXM      |                                             | NSLS X1a STXM                         |
| 1990RB&b | M         | I    | STXM      |                                             | X1a beamline and undulator            |
| 1990RCa  | P         | A, T | RSoXS     | sulphonated PS                              | resonant scattering                   |
| 1990RCa  | M         | A    | RSoXS     | Amorphous polymer films                     |                                       |
| 1990RCb  | P         | A, T | RSoXS     | sulphonated PS                              | resonant scattering                   |

| code     | materials | type | tech       | species                                 | Comments                           |
|----------|-----------|------|------------|-----------------------------------------|------------------------------------|
| 1990RCb  | M         | A    | RSoXS      | Semicrystalline polymer films           |                                    |
| 1991AK&  | M         | I    | SPEM       | circuits                                |                                    |
| 1991DC&  | B         | A    | SPEM       | neurons                                 |                                    |
| 1991HKS  | B         | R    | STXM, SPEM |                                         | popular review                     |
| 1991JR&  | P         | A, T | RSoXS      | Langmuir-Blodgett films                 | soft X-ray non-resonant scattering |
| 1991JR&  | M         | A    | RSoXS      | Langmuir-Blodgett films                 |                                    |
| 1991JW&  | B         | I    | STXM       |                                         |                                    |
| 1991M    | M         | R    | PEEM       | Hg lamp Cu/Mo(100)                      |                                    |
| 1991MD&  | B         | A    | SPEM       | neurons                                 |                                    |
| 1991T    | M         | R    | PEEM, SPEM |                                         |                                    |
| 1991TG&  | M         | I    | STXM       |                                         | zone plate fabrication             |
| 1992A    | R,I       | T    | SPEM       |                                         |                                    |
| 1992AK&a | M         | I    | SPEM       |                                         | astigmatism correction             |
| 1992AK&b | M         | I    | SPEM       |                                         |                                    |
| 1992AK&c | M         | A,I  | SPEM       |                                         |                                    |
| 1992AZ&  | P         | A    | STXM       | PAN, PS, PP                             |                                    |
| 1992B    | B         | A    | STXM       | Ca in bone                              |                                    |
| 1992BA&  | B         | A    | STXM       | Ca mapping in cartilage                 |                                    |
| 1992BB&  | B         | A    | STXM       | collagen fibrils                        |                                    |
| 1992BB&a | B         | A    | STXM       | Ca mapping in cartilage                 |                                    |
| 1992BB&b | B         | A    | STXM       | Ca mapping in cartilage                 |                                    |
| 1992BF&  | B         | A    | STXM       | Ca mapping in cartilage                 |                                    |
| 1992CKW  | P         | I    | STXM       |                                         | resolution evaluation              |
| 1992DK&  | B         | A    | PEEM       | neurons                                 |                                    |
| 1992FP&  | B         | T    | TXM/TEM    | radiation damage to cells               |                                    |
| 1992GM&  | B         | A    | STXM       | organelles in cells                     |                                    |
| 1992GP   | B         | A    | STXM       | whole cell imaging                      |                                    |
| 1992GP&  | B         | A    | STXM       | whole, wet tissue imaging               |                                    |
| 1992GR   | B         | A    | STXM       | protein secretion from zymogen granules |                                    |
| 1992J    | B         | I    | STXM       |                                         |                                    |
| 1992JKW  | I         | T,R  | TXM, STXM  |                                         | resolution                         |
| 1992JL&a | B         | I    | STXM       |                                         | luminescence detection             |
| 1992JL&b | M         | I    | STXM       |                                         | ZP replication (litho)             |

| code     | materials | type | tech      | species                | Comments                        |
|----------|-----------|------|-----------|------------------------|---------------------------------|
| 1992KA&a | B         | R    | STXM      |                        | coherence effects               |
| 1992KA&b | M         | I    | SPEM      |                        |                                 |
| 1992LK&  | B         | T    | STXM      |                        | 3d imaging by stereo microscopy |
| 1992LR&  | I         | I    | STXM      |                        | NSLS X1A undulator and beamline |
| 1992LTJ  | B         | T    | STXM/TXM  | radiation damage       |                                 |
| 1992LW&  | B         | T    | STXM      |                        | steromicroscopy                 |
| 1992M    | I         | T    | STXM, TXM |                        | phase, dark field               |
| 1992PG   | B         | T    | STXM      | live cells             |                                 |
| 1992RGL  | B         | T    | STXM      |                        | protein transport               |
| 1992WJ&a | B         | T    | STXM      | chromosomes            | radiation damage                |
| 1992WJ&b | B         | T    | STXM      | chromosomes            |                                 |
| 1992WJ&c | B         | T    | STXM      | chromosomes            |                                 |
| 1992WS&  | B         | A    | TXM       |                        |                                 |
| 1992ZJW  | B         | T    | STXM      |                        | deconvolution image enhancement |
| 1993AH   | P         | A    | STXM      | polyimide              | Dichroism mapping               |
| 1993AH   | P         | A,T  | STXM      | Kevlar                 | dichroism                       |
| 1993AJ&  | B, P      | R    | STXM      |                        |                                 |
| 1993BF&  | B         | A    | STXM      | myofibrils             | radiation damage                |
| 1993CM&  | I         | I    | SPEM      |                        | Maximum                         |
| 1993DD&  | B         | A    | PEEM      | Al in neurons          |                                 |
| 1993DH&  | B         | A    | PEEM      | neurons                |                                 |
| 1993DM   | B         | R    | PEEM      | neurons                |                                 |
| 1993DP&a | B         | A    | SPEM      | neurons                |                                 |
| 1993DP&b | B         | A    | SPEM      | neurons                |                                 |
| 1993JL&  | B         | T    | STXM      |                        | luminescence microscopy         |
| 1993SW&  | M         | T    | PEEM      | first XMCD imaging     |                                 |
| 1993WZ&  | B         | A    | STXM      | wet chromosome imaging |                                 |
| 1994AH&  | P         | A, R | STXM      |                        | dichoism                        |
| 1994BC&  | E         | A    | STXM      | coal                   |                                 |
| 1994BD&  | B         | A    | STXM      | Ca in bone             |                                 |
| 1994D    | B         | A    | PEEM      | neurons                |                                 |
| 1994DC&  | B         | R    | PEEM      |                        |                                 |
| 1994DD&  | B         | A    | PEEM      | Al in metals           |                                 |
| 1994DM&a | B         | A    | PEEM      | Al in neurons          |                                 |

| code     | materials | type   | tech       | species                                      | Comments                 |
|----------|-----------|--------|------------|----------------------------------------------|--------------------------|
| 1994DM&b | B         | A      | PEEM       | Al in neurons                                |                          |
| 1994HM&a | B         | T      | STXM       |                                              | microtomography          |
| 1994HM&b | B         | T      | STXM       |                                              | microtomography          |
| 1994KA&  | B         | R, I   | STXM       | Na salicylate                                | luminescence             |
| 1994RC   | M         | A, R   | SPEM, PEEM | GaAs, Al-Cu-S, XMCD                          |                          |
| 1994T    | I,M       | A      | PEEM       | first XMCD PEEM                              |                          |
| 1994ZA&  | P         | I, A   | STXM       |                                              | micro-XANES demonstrated |
| 1995AH&  | P         | A      | STXM       | various polymers                             |                          |
| 1995AS&  | P         | R      | STXM       | PS-PAN-polypropylene, PC-PET, Kevlar, PUR    |                          |
| 1995B    | B         | A      | STXM       | mapping Ca in tissue                         |                          |
| 1995BB&  | B         | A      | STXM       | biological Calcium phosphates                |                          |
| 1995CB&a | E         | A      | STXM       | coal                                         |                          |
| 1995CB&b | E         | A      | STXM       | C, Ca, Cl in coal                            |                          |
| 1995CB&c | E         | A      | STXM       | coal                                         |                          |
| 1995CJW  | B         | I      | STXM       |                                              | CCD detector             |
| 1995DD&  | B         | A      | PEEM       | neurons                                      | UV-ashed samples         |
| 1995GBR  | B         | A      | STXM       | zymogen granules                             |                          |
| 1995GR   | B         | A      | STXM       | zymogen granules                             |                          |
| 1995HT&a | B         | T      | STXM       |                                              | microtomography          |
| 1995HT&b | B         | I      | SPEM       |                                              |                          |
| 1995KJH  | B         | R      |            |                                              |                          |
| 1995KK&a | M         | I      | SPEM       |                                              | NSLS SPEM                |
| 1995KK&b | M         | A      | SPEM       |                                              |                          |
| 1995KK&c | M         | A      | SPEM       |                                              |                          |
| 1995MC&  | B         | R      | STXM       |                                              |                          |
| 1995MDC  | B         | R      | PEEM       |                                              |                          |
| 1995MH&  | B         | T      | STXM       |                                              | microtomography          |
| 1995SC   | B,P       | R      | STXM       |                                              |                          |
| 1995TD&  | M         | R      | PEEM, SPEM | PAN, magnetic samples                        |                          |
| 1995WJ&  | B, P      | R,B, P | STXM       |                                              | NSLS STXM review         |
| 1995ZF&  | I, M      | A      | scan-SXM   | Gd <sub>2</sub> O <sub>2</sub> S:Pr phosphor |                          |
| 1995ZJ&  | B         | I      | STXM       |                                              |                          |
| 1996AC&  | M         | A      | PEEM       | Pt/GaP(001) interface                        |                          |

| code     | materials | type | tech       | species                                                                                                                                                                       | Comments                                 |
|----------|-----------|------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1996AS&  | P         | A    | STXM       | LC polyester, LDPE/PET/Kraton. PC/ABS                                                                                                                                         |                                          |
| 1996CB&  | B, P      | A    | STXM       | sporinite in coal                                                                                                                                                             |                                          |
| 1996CF&  | B         | T    | STXM       |                                                                                                                                                                               | dark field, immuno-gold labels           |
| 1996CJW  | M         | I    | STXM       |                                                                                                                                                                               | zone plate fabrication                   |
| 1996DL&  | B         | I    | PEEM       | Transmission by PEEM                                                                                                                                                          |                                          |
| 1996DM&  | B         | A    | PEEM       | Co in granule cells                                                                                                                                                           |                                          |
| 1996J    | B         | R    | STXM       |                                                                                                                                                                               |                                          |
| 1996JC&  | B, P      | R    | STXM       |                                                                                                                                                                               | X1A STXM review                          |
| 1996K    | R         | A    | TXM, SM    |                                                                                                                                                                               |                                          |
| 1996KY&  | B         | A    | TXM        | COS cells; Mn enhanced                                                                                                                                                        |                                          |
| 1996MAS  | B         | R    | PEEM       |                                                                                                                                                                               |                                          |
| 1996MKV  | M         | I    | SFXM       | mirror focused system                                                                                                                                                         | instrument , luminescence detection      |
| 1996OJ&  | B         | I    | STXM       |                                                                                                                                                                               | cryo sample preparation                  |
| 1996SA   | P         | A    | STXM       | polyimide                                                                                                                                                                     | Dichroism mapping                        |
| 1996UH&  | P         | A    | STXM       | polyurethane characterization                                                                                                                                                 |                                          |
| 1996VF&  | M         | R, I | SFXM       | ceramics, porous Si                                                                                                                                                           | luminescence, PE, transmission detection |
| 1996WA&  | B, P      | R, I | STXM       |                                                                                                                                                                               | NSLS X1A revised beamline                |
| 1996WH&  | B, P      | R, I | STXM       |                                                                                                                                                                               | NSLS X1ASTXM IV design                   |
| 1996ZB&  | B         | A    | STXM       | Sperm (DNA, protein)                                                                                                                                                          |                                          |
| 1997A    | P         | R    | STXM       |                                                                                                                                                                               |                                          |
| 1997AD&  | B         | A    | PEEM       | Boron Neutron Capture Therapy                                                                                                                                                 |                                          |
| 1997AS&  | P         | I, R | STXM, SPEM | PS, PC, PE, PP, PET, PAR, Kevlar (PPTA), PS, PU, polyester, Nylon-6, MDI. SAN, TDI, (LDPE, PET, Kraton)-blend; PC-ABS blend<br>PUR, polyurea. BM, B2, B0, LC-polyester, ,ZDDP | NSLS polymer & tribology review (Ade)    |
| 1997BK&  | M         | I, A | (L) PEEM   | Ag/Si                                                                                                                                                                         |                                          |
| 1997BK&a | B         | A    | STXM       | tissue                                                                                                                                                                        |                                          |
| 1997BO&  | B         | A    | STXM       |                                                                                                                                                                               | amino acid spectroscopy                  |
| 1997BS&  | M         | A    | STXM       | silica                                                                                                                                                                        | colloids                                 |
| 1997BY&  | M         | I    | STXM+      | collimator after ZP                                                                                                                                                           | design                                   |
| 1997CD&  | P         | R    | PEEM       |                                                                                                                                                                               |                                          |

| code    | materials | type | tech       | species                                                                                                                       | Comments                      |
|---------|-----------|------|------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1997CM  | M         | I    | SPEM       | various                                                                                                                       |                               |
| 1997D   | B         | R    | PEEM       |                                                                                                                               |                               |
| 1997DC& | B         | T    | PEEM       |                                                                                                                               | Effect of ashing              |
| 1997DG& | B         | A    | PEEM       | Boron NCT                                                                                                                     |                               |
| 1997DM  | B         | A    | PEEM       | neurobiology                                                                                                                  |                               |
| 1997DMT | E         | A    | PEEM       | ilmenite                                                                                                                      |                               |
| 1997FW& | M         | I    | PEEM       | SMART                                                                                                                         |                               |
| 1997H   | M         | A    | PEEM       | high-Tc superconductors                                                                                                       |                               |
| 1997HS& | M         | A    | PEEM       | XMCD, FeNi alloys                                                                                                             |                               |
| 1997JZN | M         | I    | SPEM       | Si oxides                                                                                                                     |                               |
| 1997MB& | M         | A    | PEEM       | various                                                                                                                       |                               |
| 1997MC& | M         | I,R  | SPEM       | Au/Si, MoO <sub>3</sub> /sapphire,                                                                                            |                               |
| 1997MD  | B         | A,T  | PEEM       | neurobiology                                                                                                                  |                               |
| 1997MG  | M         | I    | PEEM       | Ag/Cu                                                                                                                         | angle-resolved PEEM (lab)     |
| 1997MGS | M         | I    | PEEM       | Wien filter                                                                                                                   |                               |
| 1997MR& | M         | I    | XPEEM      | various                                                                                                                       |                               |
| 1997RH& | P         | A, T | STXM       | polyethylene terephthalate                                                                                                    | damage rate relative to EM    |
| 1997SF& | M         | A    | PEEM       | XMCD, FePt alloy                                                                                                              |                               |
| 1997SJT | M         | I    | STXM       |                                                                                                                               | Lucent zone plate fabrication |
| 1997SL& | P         | A    | STXM       |                                                                                                                               |                               |
| 1997SS& | M         | A    | PEEM       | TiSi test (PRISM)                                                                                                             |                               |
| 1997TD& | M         | I    | PEEM       | PRISM                                                                                                                         |                               |
| 1997V   | M         | I    | SFXM       | luminescence                                                                                                                  | Hasylab mirrors               |
| 1997WA& | P, M      | I    | STXM, PEEM | Kevlar, PU                                                                                                                    |                               |
| 1997WW& | M         | I    | SPAM       | scanning Auger, undulator                                                                                                     |                               |
| 1998A   | P         | R    | STXM, PEEM | PC, PET, PPTA, PAR, PS, SAN, Nylon-6, PP, PE; LDPE, PET, Kraton; Liq. crystal polyester; Kevlar, magnetic domains; wood; coke |                               |
| 1998Ab  | P         | R    | STXM, PEEM |                                                                                                                               | dichroism                     |
| 1998Ac  | P         | A    | STXM       | PET, Vectra™ blend                                                                                                            |                               |
| 1998AW& | P         | A    | PEEM       |                                                                                                                               | dewetting                     |
| 1998AY& | I         | R    | PEEM       | FEL based PEEM metals                                                                                                         |                               |
| 1998BB& | B         | A    | STXM       | sperm                                                                                                                         |                               |



| code     | materials | type | tech      | species                    | Comments                            |
|----------|-----------|------|-----------|----------------------------|-------------------------------------|
| 1998BK&  | B         | A    | STXM      | bone                       |                                     |
| 1998BO&  | B         | A    | STXM      | amino acids                |                                     |
| 1998CA&  | M         | A    | STXM      | vitronite                  | luminescence alteration             |
| 1998CD&  | P         | A    | PEEM      | polyimides                 | orientation, dichroism              |
| 1998DC&  | B         | I    | PEEM      |                            | Mephisto                            |
| 1998DG&  | B         | T    | PEEM      | Transmission by PEEM       |                                     |
| 1998FC&  | B, P      | R, I | STXM      |                            | NSLS X1ASTXM IV design              |
| 1998FK&  | E         | A    | STXM      | interplanetary dust        |                                     |
| 1998FR&  | B         | A    | STXM      | Axon                       |                                     |
| 1998GR&  | B         | A    | PEEM      | Boron NCT                  |                                     |
| 1998JK   | B,P       | R    | STXM, TXM |                            | review                              |
| 1998JMW  | B         | R    | STXM      |                            | comp. to electron microscopy        |
| 1998KK&  | M         | I    | SPEM      |                            | SRRC SPEM project                   |
| 1998KW&  | P         | A    | STXM      | PAN heat treatment         |                                     |
| 1998MJ&  | B         | I    | STXM      | cell tomography            | cryo STXM instrumentation           |
| 1998MU   | B         | I    | TXM       | wet cell                   | instrument                          |
| 1998SA&a | P         | A    | PEEM      |                            | dewetting                           |
| 1998SA&b | M         | A, R | PEEM      | various                    |                                     |
| 1998SB&  | P         | A    | STXM      | PET-Vectra™                | Mechanical blends                   |
| 1998SH&  | I         | R    | PEEM      | leem, leed, peem metals    |                                     |
| 1998SJT  | M         | I    | STXM      |                            | zone plate fabrication              |
| 1998SS&  | M         | A    | PEEM      | tribology – hard disk wear |                                     |
| 1998WF&a | P         | I, R | STXM      |                            | ALS BL 7.0 first instrument         |
| 1998WF&b | M         | I    | PEEM      | SMART design description   |                                     |
| 1998WJ   | B         | I    | CXRM      |                            | contact; contrast versus resolution |
| 1998ZM&  | M         | A    | PEEM      | Boron carbide              |                                     |
| 1998ZZ&  | M         | I    | SPEM      |                            |                                     |
| 1999AP&  | I         | T    | PEEM      | PEEM2 (ALS) instrument     |                                     |
| 1999AS&a | M         | A    | PEEM      | hard disk wear             |                                     |
| 1999AS&b | M         | A    | PEEM      | hard disk wear             |                                     |
| 1999AW&  | P         | A    | STXM      | PS/PMMA                    | Phase segregation                   |
| 1999CS&a | M         | A    | PEEM      | ZDDP tribology             |                                     |
| 1999CS&b | M         | A    | PEEM      | ZDDP tribology             |                                     |
| 1999DG&  | B         | T    | PEEM      |                            | Ashing by UV/ozone                  |

| code     | materials | type | tech      | species                             | Comments                        |
|----------|-----------|------|-----------|-------------------------------------|---------------------------------|
| 1999GS&  | P         | A    | STXM      | 2,5-diphenyl-1,3,4-oxadiazole films |                                 |
| 1999HS&  | I         | R    | SPELEEM   | FET junctions                       |                                 |
| 1999HT&a | P         | A    | STXM      | polyurea capsules, PS-PI layers     |                                 |
| 1999HT&b | P,B       | A    | PEEM      | Protein - polyurethane studies      |                                 |
| 1999J    | B         | R    | STXM      | cell biology                        |                                 |
| 1999JN   | E         | A    | STXM      |                                     |                                 |
| 1999KM&  | M         | A    | TXM       | ASR gel                             | Hydration kinetics & mechanisms |
| 1999M    | M         | I    | STXM      | luminescent probes                  |                                 |
| 1999MH&  | P         | A    | PEEM      | polypyrrole, defects                |                                 |
| 1999MZ&  | M         | A    | PEEM      | Boron carbide nanowires             |                                 |
| 1999NA&  | E         | A    | STXM      | colloid emulsions. milk             |                                 |
| 1999PJP  | M         | I    | STXM      |                                     | phase contrast                  |
| 1999RK&  | E, B      | A    | STXM, TXM | Mn, Fe biomineralization            |                                 |
| 1999SG&  | P         | A    | PEEM      | PS/PBMA                             |                                 |
| 1999SP&  | M         | I    | PEEM      |                                     | 20 nm resolution                |
| 1999SS&  | P         | A    | STXM      | PMMA / PI blend                     | Mechanical blends               |
| 1999TD&  | E, B      | A    | STXM, TXM | Mn, Fe biomineralization            |                                 |
| 1999UH&  | P         | A    | STXM      | polyurethanes                       |                                 |
| 1999ZL&  | P         | A    | STXM      | PS/PMMA                             | confinement induced miscibility |
| 2000SC&  | M         | A    | STXM      | Nanopillar spin valves              | Spin injection dynamics         |
| 2000A    | B         | R    |           | many                                |                                 |
| 2000AO&  | M         | I    | STXM      |                                     | CXRO zone plate fabrication     |
| 2000BR&a | B         | T    | TXM       |                                     | Compact water window TXM        |
| 2000BR&b | B         | T    | TXM       |                                     | Compact water window TXM        |
| 2000C    | B         | A    | STXM      | lignin, cellulose                   | modern wood (oak, cedar)        |
| 2000DG&  | B         | I    | PEEM      |                                     | wet samples by inverted PEEM    |
| 2000EH&  | M         | A    | SPEM      | Cu(In, Ga)Se <sub>2</sub> films     |                                 |
| 2000FB&  | M         | I    | STXM      |                                     | STXMIV, segmented detector      |
| 2000GA&  | B         | T    | PEEM      |                                     | Charging & effects on imaging   |
| 2000GKM  | M         | A    | TXM       | cement                              | Hydration kinetics & mechanisms |
| 2000GP&a | B         | T    | PEEM      |                                     | Ashing effects on cells         |
| 2000GP&b | B         | A    | PEEM      | BSH effect on glioblastomas         |                                 |
| 2000JA&  | B,E       | R    | STXM      |                                     | review of NSLS program          |
| 2000JW&  | P         | I    | STXM      |                                     | Stack method                    |

| code     | materials | type | tech | species                                                    | Comments                                   |
|----------|-----------|------|------|------------------------------------------------------------|--------------------------------------------|
| 2000Ka   | M         | I, R | SPEM | surface & interfaces                                       |                                            |
| 2000Kb   | M         | I, R | SPEM | surface & interfaces                                       |                                            |
| 2000KG&  | M         | A    | SPEM | (Ni,Ag)/Si(111)                                            |                                            |
| 2000KJ&  | B         | I    | STXM |                                                            | sealed wet cell                            |
| 2000KW&  | B         | I    | STXM |                                                            | cryo tomography                            |
| 2000LD&  | B,E       | A    | PEEM | Sulfate reducing bacteria                                  |                                            |
| 2000LG&  | M         | A    | SPEM | O at Pt/YSZ interface                                      |                                            |
| 2000MO&  | B         | I    | STXM |                                                            | Cryo microscopy                            |
| 2000NA&  | E         | A    | STXM |                                                            |                                            |
| 2000ND&  | M         | A    | SPEM | laser annealed CdTe                                        |                                            |
| 2000NJ&  | B         | I    | STXM |                                                            | wet cell                                   |
| 2000NS&  | M         | A    | PEEM | AFM, FM coupling - pinning                                 |                                            |
| 2000OJ   | E         | T    | STXM |                                                            | principle component analysis               |
| 2000PJ&  | B         | T    | STXM |                                                            | phase contrast: expt-simulation comparison |
| 2000PK&  | E         | A    | STXM | Mn, Fe particles ox st.                                    |                                            |
| 2000RDD  | E         | A    | STXM | colloids                                                   |                                            |
| 2000SA   | M         | A, R | PEEM | XMCD, tribology                                            |                                            |
| 2000SA&  | P         | A    | STXM |                                                            | Cryo-mechanical blends                     |
| 2000SA&a | P         | A    | STXM | PMMA, PI, poly(ethylene- <i>alt</i> -propylene)            | Cryo-mechanical blends                     |
| 2000SA&b | P         | A    | STXM | PMMA, PI, poly(ethylene- <i>alt</i> -propylene)            | Cryo-mechanical blends                     |
| 2000SA&c | P         | A    | STXM | PMMA, PI, poly(ethylene- <i>alt</i> -propylene)            | bilayer polymer contact angles             |
| 2000SS&a | P         | A    | STXM | PMMA, PEP                                                  | rubber modified PMMA                       |
| 2000SS&b | P         | A    | STXM | PMMA, Polyisoprene , Poly(ethylene- <i>alt</i> -propylene) | Mechanical blends                          |
| 2000ST&  | E         | A    | STXM | soils                                                      |                                            |
| 2000TS&  | M         | I    | STXM |                                                            | zone plate fabrication                     |
| 2000WA&a | P         | A    | STXM | PS, PMMA                                                   |                                            |
| 2000WA&b | B         | I    | STXM |                                                            | renewed X1A beamline                       |
| 2000WG&  | P         | A    | STXM | PS, PMMA                                                   | Phase segregation                          |
| 2000WJ&  | B         | I    | STXM |                                                            | cryo-tomography                            |
| 2000WS&  | B         | A    | TXM  | green algae tomography                                     |                                            |

| code     | materials | type | tech       | species                                                                                                                                                                                 | Comments                       |
|----------|-----------|------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 2000WT&  | M         | I    | STXM       |                                                                                                                                                                                         | BESSY STXM                     |
| 2000WZ&  | P         | A    | STXM       | PS, PMMA                                                                                                                                                                                | Phase segregation              |
| 2000ZN   | M         | A    | SPEM       | benzoic acid / Ni(11)                                                                                                                                                                   | linear dichroism , orientation |
| 2000ZS&  | M         | A    | STXM       | a-C, graphite, diamond                                                                                                                                                                  |                                |
| 2001 SO& | I         | I    | TR-PEEM    | In, Cu                                                                                                                                                                                  | Time-resolved PEEM             |
| 2001AU   | P         | R    | STXM       |                                                                                                                                                                                         |                                |
| 2001BC&  | M         | A    | SPEM       | Ni/GaN                                                                                                                                                                                  |                                |
| 2001BC&a | M         | A    | SPEM       | Au/GaN                                                                                                                                                                                  |                                |
| 2001BC&b | M         | A    | SPEM       | Au/GaN                                                                                                                                                                                  |                                |
| 2001BGK  | M         | A    | SPEM       | metal/GaN(0001) interfaces – Shottky barriers                                                                                                                                           |                                |
| 2001CL&  | M         | A    | PEEM       | liquid crystal alignment                                                                                                                                                                |                                |
| 2001DA&  | B         | R    | TXM        | Biological and materials applications                                                                                                                                                   |                                |
| 2001DC&  | B         | A    | PEEM       | Gd in glioblastoma cells                                                                                                                                                                | Gd NCT                         |
| 2001DG&  | B,E       | R    | PEEM       |                                                                                                                                                                                         |                                |
| 2001FB&  | B,E       | R    | STXM       |                                                                                                                                                                                         | review of NSLS program         |
| 2001FJ&  | M         | I    | STXM       |                                                                                                                                                                                         | segmented detector             |
| 2001GB&  | M         | A    | SPEM       | (Ni,Ag)/Si(111)                                                                                                                                                                         |                                |
| 2001GM&a | B         | R    | PEEM       |                                                                                                                                                                                         |                                |
| 2001GM&b | E         | A,I  | PEEM       | biomineralization                                                                                                                                                                       | Charge compensation            |
| 2001GM&c | M         | I    | SPEM       | multi-channel detection                                                                                                                                                                 |                                |
| 2001GM&d | M         | A    | SPEM       | laterally inhomogeneous surface reactions                                                                                                                                               |                                |
| 2001H    | P, B      | R    | STXM, PEEM | PUR (MDI)-polyurea precipitates; 355 (PU-matrix, SAN, pipa); PS-PI-PS trilayer; polyurea capsules; HSA on PUR-filler; Alb on PTMO-ED-MDI (polytetramethylene oxide±ethylenediamine±MDI) |                                |
| 2001HK&  | P         | A    | STXM       | Polyurethanes, urea precipitates                                                                                                                                                        |                                |
| 2001HS   | P,B       | R    | STXM, PEEM | many                                                                                                                                                                                    |                                |
| 2001HT&  | I         | T    | PEEM       | hard X-rays, Fe K-edge                                                                                                                                                                  |                                |
| 2001KH&  | P         | A    | STXM       | DVB55, EGDMA                                                                                                                                                                            | core-shell microspheres        |
| 2001LD&a | M         | A    | SPEM       | laser annealed Ti/Si(111)                                                                                                                                                               |                                |

| code     | materials | type | tech       | species                                                     | Comments                              |
|----------|-----------|------|------------|-------------------------------------------------------------|---------------------------------------|
| 2001LD&b | M         | A    | SPEM       | laser annealed Ti/Si(111)                                   |                                       |
| 2001LD&c | M         | A    | SPEM       | laser annealed Ti/Si(111)                                   |                                       |
| 2001LSa  | M         | I    | SPEM       |                                                             | PSL beamline and undulator            |
| 2001LSb  | M         | I    | SPEM       | electrical circuits                                         | instrument description                |
| 2001MH&  | B         | A    | TXM        | Protein in cells                                            |                                       |
| 2001MI&  | P         | A    | PEEM, STXM | PS, PMMA                                                    | Compare to AFM; phase segregation     |
| 2001OJ&  | B         | I    | STXM       | sperm                                                       | cryo STXM instrumentation             |
| 2001OR&  | M         | A    | PEEM       | interfacial mag. spin imaging                               |                                       |
| 2001OS&  | M         | A    | PEEM       | AFM, FM coupling - pinning                                  |                                       |
| 2001RO&  | M         | A    | PEEM       | metal-oxide interfaces (pinning)                            |                                       |
| 2001SA&a | P         | A    | STXM       | Polycarbonate; poly(ABS)                                    |                                       |
| 2001SA&b | P         | A    | STXM       | tires                                                       | Mechanical blends                     |
| 2001SA&c | P         | A    | STXM       | PMMA/ poly(ethylene- <i>alt</i> -propylene)                 | Cryo-mechanical blends                |
| 2001SB   | M         | A    | PEEM       | Pb on Si(111) with Au interfactant                          |                                       |
| 2001SK&  | E         | A    | STXM       | humic acid, fulvic acid                                     |                                       |
| 2001SL   | M         | I    | SPEM       |                                                             | PSL SPEM                              |
| 2001SN&  | M         | A    | PEEM       | AFM, FM coupling - pinning                                  |                                       |
| 2001SU&  | P         | A, R | STXM       | PC, P(BrS), PS, PMMA, PE, PVC-PET (food packaging film), PP |                                       |
| 2001VC&  | B         | I    | STXM       |                                                             | dark field microscopy                 |
| 2001WK&  | M         | I    | TXM        |                                                             | DIC mode                              |
| 2001ZG&  | P         | A    | STXM       | PB/ BIMS / filler (= C-black or SiO <sub>2</sub> )          | nanofiller effect on interfaces       |
| 2002AK&  | P         | A    | STXM       | polylefins                                                  |                                       |
| 2002AS   | P         | R    |            | many                                                        |                                       |
| 2002BC&a | B         | A    | STXM       | Fossil plant cells                                          |                                       |
| 2002BC&b | M         | I    | STXM       |                                                             | Combined for STXM & topography (AFM?) |
| 2002BF&  | B         | R    | STXM       |                                                             | review of NSLS program                |
| 2002BG&a | M         | A    | SPEM       | electrochemically patterned Ga on GaN                       |                                       |
| 2002BG&b | M         | A    | SPEM       | metal/GaN – Schottky barriers                               |                                       |
| 2002BK   | M         | R    | SPEM       | zone plate microscopies                                     |                                       |
| 2002BS&  | M         | A    | SPEM       | O/Ru(0001)                                                  |                                       |
| 2002CB&  | E         | A    | STXM       | high-pH clays                                               |                                       |
| 2002CUA  | P         | A    | STXM       | PMMA, many others                                           | radiation damage                      |
| 2002FGD  | B,E       | T    | PEEM       | Transmission in PEEM                                        |                                       |

| code     | materials | type | tech         | species                                   | Comments                             |
|----------|-----------|------|--------------|-------------------------------------------|--------------------------------------|
| 2002GK&  | M         | R    | SPEM, u-ESCA | review                                    |                                      |
| 2002GL&  | M         | A    | SPEM         | XPS of single carbon nanotubes            |                                      |
| 2002GM&  | M         | A    | SPEM         | K transport on catalysts                  |                                      |
| 2002GM&b | M         | A    | SPEM         | patterns in H&O on Rh(110)/Pt             |                                      |
| 2002HM&  | P, B      | A    | STXM         | polyurethane, SAN, pipa, Fg               | protein on polymers, dry vs. wet     |
| 2002JB&  | B,E       | R    | STXM         |                                           | review of NSLS program               |
| 2002KD&  | P         | A    | STXM         | PS                                        | craze alignment, dichroism           |
| 2002KH&  | P         | A    | STXM         | PAA, PE                                   | Filtration membranes                 |
| 2002KO&  | B         | A    | STXM         |                                           | amino acid spectroscopy              |
| 2002KP&  | M         | I    | STXM         |                                           | Differential phase contrast aperture |
| 2002LG&  | M         | A    | microprobe   | LiF direct patterning                     |                                      |
| 2002LJ&  | M         | A    | SPEM         | reduction fronts in zirconia              |                                      |
| 2002MG&a | M         | A    | SPEM         | patterned alkali on metals                |                                      |
| 2002MG&b | M         | A    | SPEM         | transport of alkali on metals             |                                      |
| 2002MW&  | P         | A    | STXM         | PAA                                       | Cross-link mapping                   |
| 2002ND&  | M         | A    | SPEM         | laser modified Pt/Si(001)                 |                                      |
| 2002PH&  | M         | A    | SPEM         | PbS oxidation                             |                                      |
| 2002PM&a | M         | I    | SPEM         | multi-channel detection in SPEM (e)       |                                      |
| 2002PM&b | M         | A    | SPEM         | Au/Ni(poly)                               |                                      |
| 2002PR   | E         | A    | STXM         | Eu(III) – humics agglomeration            |                                      |
| 2002RMM  | M         | A    | STXM         | Organics on atmospheric particles         |                                      |
| 2002RN&  | M         | A    | PEEM         | singl ~10 nm Fe2O3 nanoxlls               | sub spatial resolution spectroscopy  |
| 2002RU&  | P         | A    | STXM         | Polyurethanes, SAN, pipa                  |                                      |
| 2002SO&  | M, I      | A, T | PEEM         | XMCD at PEEM2                             |                                      |
| 2002SW&  | M         | A    | SPEM         | Cs in carbon nanotubes                    |                                      |
| 2002SW&b | M         | A    | SPEM         | XPS of carbon nanotubes                   |                                      |
| 2002UA   | E         | A    | STXM         | carbonyl compounds                        |                                      |
| 2002WK&  | M         | I    | TXM          |                                           | DIC mode                             |
| 2002YS   | B         | A    | TXM          | macrophages                               |                                      |
| 2002ZF&  | P         | A    | STXM         | PMMA, Silsequioxane                       |                                      |
| 2003AK&  | P         | I    | STXM         | STXM532 instrumentation                   |                                      |
| 2003BC&a | B         | A    | STXM         | Fossil plant cells                        |                                      |
| 2003BC&b | M         | A    | SPEM         | Si nanowires catalysed by C nanoparticles |                                      |

| code     | materials | type | tech         | species                       | Comments                                     |
|----------|-----------|------|--------------|-------------------------------|----------------------------------------------|
| 2003BF&  | M         | A    | SPEM         | Fe/Au(001) magnetic films     | role of Au segregation                       |
| 2003BG&  | M         | R    | STXM, PEEM   | review                        |                                              |
| 2003BJ   | P         | A    | STXM         | PMMA                          | radiation damage                             |
| 2003CB&  | P         | A    | STXM         |                               | Crystal structure from dichroism             |
| 2003CM&  | P         | A    | STXM         | polyurea capsules             |                                              |
| 2003DC&  | M         | I    | STXM         |                               | Optics design                                |
| 2003DF&  | E         | I    | PEEM         | zircon                        | Charge compensation                          |
| 2003FG&  | M         | T    | PEEM         |                               | Depth sensitivity                            |
| 2003FJ&  | M         | I    | STXM         |                               | segmented detector                           |
| 2003FK&a | E         | A    | STXM         | interplanetary dust           |                                              |
| 2003FK&b | E         | A    | STXM         | extraterrestrial organics     |                                              |
| 2003GK   | P         | R    | STXM, PEEM   | PS/P(BrS) wetting             | wetting of polymer surfaces                  |
| 2003GT&  | E         | T    | STXM         |                               | analysis program for Fe-organic interactions |
| 2003HA&  | P         | A    | STXM         | 3d chemical mapping of toners | First serial section STXM tomo               |
| 2003HAA  | P         | A    | PEEM         | PS, PMMA                      |                                              |
| 2003JF&  | E         | T    | STXM         |                               | cluster analysis                             |
| 2003Jxx  | M         | A    | TXM          | cement                        | Hydration kinetics & mechanisms              |
| 2003K    | M         | R    | SPEM, u-ESCA | review                        |                                              |
| 2003KB&  | M         | I    | TXM, STXM    | Twin-mic progress report      |                                              |
| 2003KM   | M         | A    | TXM          | Chemical additives            |                                              |
| 2003KMM  | M         | A    | TXM          | Steel-in-cement - corrosion   |                                              |
| 2003KR   | M         | A    | TXM          | Ash filler in cement          | Hydration kinetics                           |
| 2003KT&  | P         | I    | STXM         | polyurethane, SAN, pipa       | ALS interferometric STXM                     |
| 2003LN&  | M         | A    | PEEM         | AFM, FM coupling - pinning    |                                              |
| 2003LS&  | B, E      | A    | STXM         | bio-mapping biofilms          |                                              |
| 2003MK&  | M         | A    | PEEM         | ZDDP tribology                |                                              |
| 2003OS&  | M         | A    | PEEM         | exchange bias                 |                                              |
| 2003PM&  | M         | A    | SPEM, XPEEM  | Pd/Ni(poly) dynamics          |                                              |
| 2003RMD  | E         | A    | STXM         | Eu(111)-humic aggregates      |                                              |
| 2003SC&a | E         | A    | STXM         | organics in clays             |                                              |
| 2003SC&b | M         | A    | SPEM         | SiN/Si(111)                   |                                              |
| 2003SH&  | E         | A    | STXM         | colloid functional groups     |                                              |
| 2003ST&  | E         | A    | STXM         | soil colloids                 |                                              |
| 2003TSK  | E         | A    | TXM          | Bacteria & soil colloids      | tomography                                   |

| code     | materials | type | tech       | species                                               | Comments                                     |
|----------|-----------|------|------------|-------------------------------------------------------|----------------------------------------------|
| 2003WA&  | P         | A    | STXM       |                                                       | Application to rubber science                |
| 2003WS&  | P         | A    | STXM, PEEM | PS, PMMA                                              |                                              |
| 2003WYJ  | M         | I    | STXM       |                                                       | achromatic Fresnel optics                    |
| 2003ZG   | P, M      | A    | STXM       | PS, PMMA, WS <sub>2</sub> nanotubes                   |                                              |
| 2004A    | P         | R    |            | many                                                  |                                              |
| 2004AB&a | M         | A    | XPEEM      | electron quantum confinement                          | nanospectroscopy                             |
| 2004AB&b | M         | A    | XPEEM      | Pd/W(110)                                             |                                              |
| 2004AG&  | M         | A    | SPEM       | Au/Si <sub>3</sub> N <sub>4</sub> /Si(111) interfaces |                                              |
| 2004AT&  | M         | A    | SPEM       | TM nanocrystals in carbon                             | XPS mapping                                  |
| 2004BL&  | E, B      | A    | STXM       | marine particulates                                   |                                              |
| 2004BS&  | E         | A    | STXM       | diesel soot                                           |                                              |
| 2004BY&  | E         | A    | STXM       | Mn redox states                                       |                                              |
| 2004BZ&  | B         | A    | STXM       | Fossil plant cell walls                               |                                              |
| 2004CA&a | M         | A    | PEEM(t)    | magnetic vortex dynamics                              |                                              |
| 2004CA&b | M         | A    | PEEM-(t)   | vortex dynamics                                       |                                              |
| 2004CA&c | M         | A    | SPEM       | UV metallization of TiO <sub>2</sub>                  | Valence band patterning                      |
| 2004CD&  | E         | A    | PEEM       | Polysaccharide templating of Fe nanofibers            |                                              |
| 2004CV&  | M         | A    | PEEM       | Ag/Si(111)                                            |                                              |
| 2004DF&  | B         | T    | PEEM       | Cell surfaces                                         | Ion sputtering depth profile                 |
| 2004DL&  | M         | I    | STXM       | Cu, CO, CO <sub>2</sub>                               | in situ gas-solid absorption cell, catalysis |
| 2004DM&  | M         | A    | SPEM       | promoter induced phase segregation                    |                                              |
| 2004FG&  | B         | I    | PEEM       |                                                       | Sphinx performance                           |
| 2004FK&a | E         | A    | STXM       | interplanetary dust                                   |                                              |
| 2004FK&b | E         | A    | STXM       | extraterrestrial organics                             |                                              |
| 2004FM&  | I         | T    | PEEM       | aberration corrector design                           |                                              |
| 2004FW&  | M         | A    | SPEM       | Au/Si(111)-H interface                                | annealing effects                            |
| 2004GB&  | M         | I    | u-ESCA     | 48-channel XPS detector                               |                                              |
| 2004GE&  | M         | A    | SPEM       | MoO <sub>3</sub> on Al <sub>2</sub> O <sub>3</sub>    | gas transport                                |
| 2004GS&  | E         | A    | STXM       | radionuclide migration                                |                                              |
| 2004HRH  | M         | T    | TXM        |                                                       | Micro zone plate fabrication                 |
| 2004IW&  | M         | A    | SPEM       | O at Al/organic interfaces                            |                                              |
| 2004KM&  | E         | A    | STXM       | interplanetary dust                                   |                                              |
| 2004LH&  | B,E       | A    | STXM       | biofilms                                              |                                              |



| code    | materials | type | tech    | species                                            | Comments                                       |
|---------|-----------|------|---------|----------------------------------------------------|------------------------------------------------|
| 2004LHK | M         | A    | XPEEM   | Au/Rh(110)                                         | kinetics of lateral spread                     |
| 2004LJ& | E         | T    | STXM    |                                                    | cluster analysis                               |
| 2004LL  | B         | A    | TXM     | Yeast cells (S. Pombe)                             | tomography                                     |
| 2004M   | B,M       | A    | X-PEEM  | HSA/PS-PMMA                                        | biomaterials                                   |
| 2004MG& | M         | A    | SPEM    | O <sub>2</sub> +H <sub>2</sub> reaction on Rh(110) |                                                |
| 2004MH& | P         | A    | PEEM    | PS, PMMA, Fg                                       | protein adsorption on polymer blend            |
| 2004MR& | E         | A    | STXM    | aerosols                                           | Impact on climate forcing                      |
| 2004NB& | M         | A    | PEEM    | Antiwear films                                     |                                                |
| 2004NK& | M         | A    | PEEM    | Antiwear films                                     |                                                |
| 2004NN& | M         | A    | PEEM    | Antiwear films                                     |                                                |
| 2004OK& | I,M       | T    | PEEM(t) | time-of-flight energy analysis                     |                                                |
| 2004PR& | E         | A    | STXM    | humic acid analysis                                |                                                |
| 2004PRD | E         | A    | STXM    | groundwater colloids                               |                                                |
| 2004RH& | M         | T    | TXM     |                                                    | Condenser zone plate fabrication               |
| 2004RPD | E         | A    | STXM    | organics speciation in soils                       |                                                |
| 2004SL& | M         | A    | PEEM    | AFM exchange spring                                |                                                |
| 2004SN  | M         | A    | PEEM    | exchange bias – domain size effect                 |                                                |
| 2004ST& | M         | A    | SPEM    | La1=4Pr3=8Ca3=8MnO3 Manganite                      | Detect insulating domains in metallic mtx      |
| 2004SW& | M         | A    | SPEM    | valence band of SW carbon nanotubes                |                                                |
| 2004TW& | B,E,M     | I    | STXM    |                                                    | ALS STXM11.0.2 instrument description          |
| 2004W   | P         | A    | STXM    | BR/BIMS rubbers                                    |                                                |
| 2004WD& | M         | I    | STXM    |                                                    | Twinmic Ta zone plates                         |
| 2004WK& | M         | I    | STXM    |                                                    | Twinmic Ta zone plates                         |
| 2004YJ& | E         | A    | STXM    | Al micro-organisms                                 |                                                |
| 2005AH& | P         | A    | STXM    | Ca alginate; poly N-vinylpyrrolidone               |                                                |
| 2005BC& | M         | A    | SPEM    | nanoparticles to nanotubes                         | catalytic free transformation                  |
| 2005BH& | E         | A    | STXM    | diesel soot                                        | TEM-EELS comparison                            |
| 2005BN& | M         | A    | SPEM    | subsurface O in O/Ru(0001)                         |                                                |
| 2005BR& | E         | A    | STXM    | Eu(III) adsorb. on smectite                        |                                                |
| 2005BS& | E         | A    | STXM    | diesel soot                                        |                                                |
| 2005BT& | E         | A    | STXM    | Eu on smectite                                     |                                                |
| 2005CH& | M         | I    | STXM    |                                                    | CXRO zone plate fabrication – 15 nm resolution |
| 2005CS& | P         | A    | STXM    | DVB55, malonic acid, EGDMA                         | tectocapsules                                  |

| code     | materials | type | tech        | species                                               | Comments                    |
|----------|-----------|------|-------------|-------------------------------------------------------|-----------------------------|
| 2005CS&b | E         | A    | STXM        | Cm(III) sorption                                      |                             |
| 2005DB&  | M         | A    | SPEM        | oxid/ reduct of Rh(110)                               |                             |
| 2005DC&  | M         | I    | STXM        |                                                       | Optics design               |
| 2005DRC  | B         | A    | PEEM        | Gd CNT                                                |                             |
| 2005DSG  | E         | A    | PEEM        | biomineralization                                     |                             |
| 2005FA&  | P         | A    | STXM        | P4VP/SiO <sub>2</sub> microgel particles pH swellable | stimulus response microgels |
| 2005FF&  | I         | T    | PEEM        | aberration corrector design                           |                             |
| 2005GFA  | E         | A    | PEEM        | biomineralization                                     |                             |
| 2005GML  | B         | A    | TXM         | Yeast cells (S. Pombe)                                | tomography                  |
| 2005GS&  | P         | I    | STXM        | polyaniline                                           | in situ electrochemistry    |
| 2005HM&  | M,E       | R    | STXM        | Polyurethanes, biofilms                               | review                      |
| 2005Jxx  | M         | A    | TXM         | CaCl <sub>2</sub> in cement                           |                             |
| 2005KS   | E         | A    | STXM        | metal transport                                       |                             |
| 2005LB&  | M         | R    | SPEM, XPEEM | review                                                |                             |
| 2005LJ&  | E         | T    | STXM        |                                                       | Cluster analysis method     |
| 2005LL&  | E         | A    | STXM        | black carbon, soil                                    |                             |
| 2005LS&  | M         | A    | XPEEM       | H <sub>2</sub> +O <sub>2</sub> on au/Ru(110)          |                             |
| 2005MB&  | M         | A    | SPEM        | dark spots on OLEDs                                   |                             |
| 2005ML&  | B         | A    | STXM        | lignin mapping                                        |                             |
| 2005MP&  | P         | A    | STXM        | Polymer resists                                       |                             |
| 2005NB&  | M         | A    | PEEM        | Antiwear films                                        |                             |
| 2005NN&  | M         | A    | PEEM        | Antiwear films                                        |                             |
| 2005NT&  | M         | A    | STXM        | Actinide particles                                    |                             |
| 2005OK&  | M         | T    | PEEM(t)     | XMCD dynamics                                         |                             |
| 2005PL&  | M         | A    | PEEM        | Antiwear films                                        |                             |
| 2005PM&  | M         | A    | SPEM        | Pd/Ni as f(T)                                         |                             |
| 2005PR&  | E         | A    | STXM        | model studies for humics in soil                      |                             |
| 2005SB&  | E         | A    | STXM        | fulvic acids in aquifers                              |                             |
| 2005SC&  | B,M       | A    | SPEM        | cysteine on Pt(111)                                   |                             |
| 2005SC&a | E         | A    | STXM        | humics in soil                                        |                             |
| 2005SC&b | E         | A    | STXM        | organic soil colloids                                 |                             |
| 2005SL&  | E         | A    | STXM        | organics speciation in soils                          |                             |
| 2005SM   | M         | A    | TXM         | Cement deterioration                                  |                             |

| code     | materials | type | tech    | species                                                                             | Comments                                      |
|----------|-----------|------|---------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| 2005SR&  | M         | A    | TXM     | Electromigration visualization                                                      |                                               |
| 2005SS&  | E,B       | R    | PEEM    | nacre; Fe-OOH template; zircons;<br>designer peptides for guiding<br>mineralization |                                               |
| 2005TF&  |           |      |         |                                                                                     |                                               |
| 2005TO&  | P         | A    | STXM    | PS, PMMA                                                                            |                                               |
| 2005WAA  | P         | A, T | RSoXS   | PS-PMMA                                                                             | resonant scattering                           |
| 2005WAA  | M         | R    | RSoXS   | Organic thin films                                                                  |                                               |
| 2006AA&  | P         | A    | REXS    |                                                                                     |                                               |
| 2006AA&  | M         | A    | RSoXS   | PS & PMMA particles                                                                 |                                               |
| 2006AC&  | M         | B    | TXM     | 15 nm bio imaging                                                                   |                                               |
| 2006AH&  | B         | A    | STXM    | melanomas in mouse iris                                                             |                                               |
| 2006AS&  | M         | A    | PEEM(t) | quantum magnetism dynamics                                                          |                                               |
| 2006BA&  | B, E      | R,I  | STXM    | environmental apps.                                                                 | ALS BL 11.0.2 MES science overview            |
| 2006BM&  | M         | A    | STXM    | Calcification deposits                                                              | Bacterial origin of human calcification       |
| 2006BT&  | E         | A    | STXM    | Wild 2 comet analysis                                                               |                                               |
| 2006BW&  | E         | A    | STXM    | diesel soot                                                                         |                                               |
| 2006CH&  | M         | A    | PEEM    | polyimide alignment                                                                 |                                               |
| 2006CR&  | P, B      | A    | STXM    | silk                                                                                | Dichroism mapping                             |
| 2006CZ&  | M         | A    | SPEM    | organic LED degradation                                                             |                                               |
| 2006D    | E         | A    | STXM    | actinide speciation                                                                 |                                               |
| 2006DA&  | M         | A    | SPEM    | Oxidation of Rh(001)                                                                |                                               |
| 2006DL&  | B, E      | A    | STXM    | chlorhexidine in biofilms                                                           | antimicrobials                                |
| 2006DR&  | B         | A    | PEEM    | Gd neutron capture therapy                                                          |                                               |
| 2006DT&  | B, E      | A    | STXM    | Fe, Ni, Mn in biofilms                                                              |                                               |
| 2006DZ&  | E         | A    | STXM    | zeolites                                                                            | H <sup>+</sup> , Cu <sup>+</sup> exchange     |
| 2006EO&  | M         | T    | STM-SR  | Ni-dots                                                                             | STM tip current modulation by SR, 20 nm       |
| 2006FH&a | M         | A    | STXM    | carbon nanotubes                                                                    |                                               |
| 2006FH&b | B         | I    | STXM    |                                                                                     | dark/phase detector (segmented Si photodiode) |
| 2006FK&  | E         | A    | STXM    | extraterrestrial organics                                                           |                                               |
| 2006GH&  | M         | A    | SPEM    | K 7 K/O on Rh(111)                                                                  |                                               |
| 2006GM&  | M         | T    | STXM    | CCD-based segmented detector                                                        |                                               |
| 2006GM&  | M         | I    | STXM    |                                                                                     | Twinmic STXM & configurable detector          |

| code     | materials | type | tech     | species                                                                                                                     | Comments                                        |
|----------|-----------|------|----------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 2006GR&  | M         | A    | TXM      | Electromigration visualization                                                                                              |                                                 |
| 2006HB&a | E         | A    | STXM     | black carbon, sediments                                                                                                     |                                                 |
| 2006HB&b | E         | A    | STXM     | black carbon in sediments                                                                                                   |                                                 |
| 2006HH&a | P, B      | A    | STXM     | silk worm cocoon silk                                                                                                       | orientation mapping                             |
| 2006HH&b | I, P, B   | A    | STXM     | spider dragline silk                                                                                                        | in situ azimuthal rotation; orientation mapping |
| 2006HLH  | M         | T    | TXM      |                                                                                                                             | Optimizing zone plate fabrication               |
| 2006IT&a | P         | A    | STXM     | toners                                                                                                                      |                                                 |
| 2006IT&b | P         | A    | STXM     | toners                                                                                                                      |                                                 |
| 2006JD&a | B         | A    | STXM     | Tomography - biofilm                                                                                                        | First 3d chemical mapping by tomo               |
| 2006JD&b | P         | A    | STXM     | Tomography – PS, acrylate spheres                                                                                           |                                                 |
| 2006KF&  | M         | A    | TXM      | CoCrPt multilayer                                                                                                           | 15 nm XMCD imaging of domains                   |
| 2006KS&  | E         | A    | STXM     | soils                                                                                                                       |                                                 |
| 2006KS&  | M         | I    | TXM/STXM |                                                                                                                             | Elettra Twinmic description                     |
| 2006L    | B, M      | A    | X-PEEM   | HSA/ & Fg / PS-PMMA                                                                                                         | biomaterials                                    |
| 2006LA&  | M         | A, R | XPEEM    | review                                                                                                                      |                                                 |
| 2006LH&  | P         | A    | PEEM     | PS, PMMA, alb                                                                                                               | protein adsorption on polymer blend             |
| 2006LH&b | I,M       | A    | PEEM     |                                                                                                                             | CLS PEEM described                              |
| 2006LK   | M         | R    | SPEM     | review                                                                                                                      |                                                 |
| 2006LL&  | E         | A    | STXM     | black carbon in sediments                                                                                                   |                                                 |
| 2006LM&  | M         | A    | XPEEM    | periodic surface reactions                                                                                                  |                                                 |
| 2006MG&  | M         | I    | STXM     |                                                                                                                             | CCD system for bright/dark/phase                |
| 2006ML&  | P         | A, T | RSoXS    | low K dielectric                                                                                                            | resonant scattering                             |
| 2006ML&  | M         | A    | RSoXS    | SiLK structure                                                                                                              |                                                 |
| 2006MW&a | P         | A    | STXM     | poly(9,9-dioctylfluorene-co-N-(4-butylphenyl)diphenylamine) (TFB) and poly(9,9'-dioctylfluorene-co-benzothiadiazole) (F8BT) | solar cell blend                                |
| 2006MW&b | P         | A    | STXM     | fullerene-PHT, PCBM composites                                                                                              | reinforcement                                   |
| 2006NP&  | E         | A    | STXM     | Eu(II) in humics                                                                                                            |                                                 |
| 2006OL&  | P         | A    | STXM     | Hydrogen Silsesquioxane Resist                                                                                              | Damage mechanisms                               |
| 2006OS&  | M         | A    | PEEM     | exchange bias                                                                                                               |                                                 |
| 2006PL&  | M         | A    | XPEEM    | Tribofilms on steel                                                                                                         | Role of cation                                  |
| 2006SA&a | P         | A    | STXM     | PS/PMMA, PC/SN and PMMA/EVA                                                                                                 | Clay compatibilizers                            |

| code     | materials | type | tech                | species                                 | Comments                                             |
|----------|-----------|------|---------------------|-----------------------------------------|------------------------------------------------------|
|          |           |      |                     | blends with Cloisite 20A or Cloisite 6A |                                                      |
| 2006SA&b | E         | A    | STXM                | Wild 2 comet analysis                   |                                                      |
| 2006SC&  | E         | A    | STXM                | dissolved organic matter                |                                                      |
| 2006SW   | M         | R    | all                 | Magnetism – spectroscopy & microscopy   |                                                      |
| 2006TVH  | B         | T    | TXM                 | Diatom, COS-cells                       | Liquid jet TXM design & performance                  |
| 2006VL&a | B         | T    | TXM                 | Diatom, COS-cells                       | Liquid jet TXM design & performance                  |
| 2006VL&b | M         | I    | TXM                 |                                         | Twinmic condenser (coherence breaking)               |
| 2006WP&  | M         | A    | STXM                | vortex dynamics                         | 80 ps time resolution                                |
| 2006WR&  | P         | A    | PEEM                | PE                                      | T-m depends on substrate                             |
| 2006YB&  | E         | A    | STXM                | Coke, carbon black, soot                |                                                      |
| 2006ZA&  | M         | A    | STXM                | polyethylene                            | Solid state effects on C 1s spectrum                 |
| 2006ZZ&  | E         | A    | STXM                | Wild 2 comet analysis                   |                                                      |
| 2007AB&a | M         | A, R | SPEM, XPEEM         | review                                  |                                                      |
| 2007AB&b | M         | A    | XPEEM               | Mg/W(110)                               |                                                      |
| 2007AC&  | M         | A    | STXM                | Permalloy magnetic dynamics             | Software for acquisition                             |
| 2007BT&  | M         | T    | TXM                 |                                         | Zone plate testing rig                               |
| 2007CK   | E         | A    | STXM                | humic acids                             |                                                      |
| 2007CP&  | M         | A    | STXM                | permalloy                               | Vortex core dynamics                                 |
| 2007DK&  | M         | A    | TXM                 | Polyelectrolyte capsules                |                                                      |
| 2007EG&  | M,B       | R    | SPEM, TXM, STXM, IR | Bone, catalysts                         | Overview of Elettra capabilities as TwinMIC turns on |
| 2007FA&  | P         | A    | STXM                | P4VP-SiO2 microgel                      |                                                      |
| 2007FB&  | M         | A    | STXM                | nanotubes                               |                                                      |
| 2007FK&  | M         | A    | TXM                 | permalloy                               | Magnetic dynamics                                    |
| 2007FU   | M         | A    | STXM                | n-alkane films                          | growth (n, T dependence)                             |
| 2007GG&  | M         | A    | SPEM                | organic LED degradation                 |                                                      |
| 2007GS&  | B         | A    | TXM                 | Yeast cells (S. Pombe)                  | tomography                                           |
| 2007GS&  | M         | A    | XPEEM               | Tibology properties on nano-diamond     |                                                      |
| 2007GT&  | B,P       | A    | TXM                 | dragline spider silk                    |                                                      |
| 2007HFJ  | M         | T    | STXM                |                                         | Quantitative amplitude & phase imaging               |
| 2007HH&  | I, P, B   | A    | STXM                | spider dragline silk                    | orientation mapping                                  |
| 2007HJ&  | P, I      | A    | STXM                | Polyacrylate-polystyrene spheres in 3d  | Tomography at C 1s edge                              |
| 2007HJW  | B,E,P     | R    |                     | many                                    |                                                      |

| code     | materials | type | tech       | species                                | Comments                                    |
|----------|-----------|------|------------|----------------------------------------|---------------------------------------------|
| 2007HL&a | P         | A    | STXM       | polyurea – aromatic, aliphatic         | capsules                                    |
| 2007HL&b | E         | A    | STXM       | Aerosol balls                          | correlate optical, chemical, physical props |
| 2007HT&  | E         | A    | STXM       | black carbon & aerosols                |                                             |
| 2007HYV  | M         | T    | TXM        | Modeling image formation               | Phase contrast microscope                   |
| 2007JT&  | P, I      | A    | STXM       | Polyacrylate-polystyrene spheres in 3d | tomography                                  |
| 2007KB&  | M         | A    | STXM       | permalloy                              | Mag. Vortex dynamics                        |
| 2007KD&a | M, P      | A    | STXM       | Liquid crystal                         | orientation mapping                         |
| 2007KD&b | M         | A    | TXM        | Polyelectrolyte assemblies (colloids)  |                                             |
| 2007KH   | P         | A    | STXM       | smectic liquid crystal                 | orientation mapping                         |
| 2007KK&  | M         | I    | STXM, PEEM | CLS 10ID beamline & microscopes        |                                             |
| 2007LHH  | M         | T    | TXM        |                                        | High resolution ZP manufacture              |
| 2007LT&  | M         | T    | TXM        |                                        | High resolution ZP manufacture              |
| 2007MA&  | B, M      | A    | PEEM       | nacre (aragonite)                      | polarization mapping                        |
| 2007MB&a | M         | A    | SPEM       | LiF damage & patterning                |                                             |
| 2007MB&b | M         | A    | TXM        | permalloy                              | Magnetic dynamics                           |
| 2007MT&  | E         | A    | STXM       | Soot by laser – aerosol models         |                                             |
| 2007MW&  | M         | A    | STXM       | Photovoltaic cells                     |                                             |
| 2007PL&a | M         | A    | XPEEM      | Tribofilms on steel                    |                                             |
| 2007PL&b | M         | A    | XPEEM      | Tribofilms on AlSi                     |                                             |
| 2007PL&b | M         | A    | XPEEM      | ZDDP tribofilms on AlSi                |                                             |
| 2007RH&  | P, B      | A    | STXM       | silk                                   | orientation mapping                         |
| 2007SC&  | E         | A    | STXM       | colloid particulates in lake water     |                                             |
| 2007SG&a | M         | A    | XPEEM      | Tribology properties on nano-diamond   |                                             |
| 2007SG&b | M         | T    | TXM        | diatom                                 | Algorithm for auto-locating Au cols         |
| 2007SPH  | M         | T    | STXM       | wet cell design                        |                                             |
| 2007TG&  | E         | A    | STXM       | aerosol tar balls                      |                                             |
| 2007TG&  | P         | A    | STXM       | phase change microcapsules             | first SLS science paper ?                   |
| 2007TOH  | M         | T    | TXM        |                                        | Phase contrast microscope                   |
| 2007TS&  | B         | T    | TXM        | Diatom, COS-cells                      | Liquid jet TXM design & performance         |
| 2007ULF  | P, M      | R    | STXM, PEEM | orientation mapping                    |                                             |
| 2007WA&  | M         | R    | RSoXS      | Organic thin films                     |                                             |
| 2007WB&  | M         | A    | STXM       | Stardust tracks                        |                                             |
| 2007WS&  | P         | A    | STXM       | PMMA, PAN                              | chemically sensitive patterning             |
| 2007WSH  | P         | A    | STXM       | PMMA, PAN, PEC, PPC                    | Tricolor chemically sensitive patterning    |

| code     | materials | type | tech       | species                                              | Comments                                      |
|----------|-----------|------|------------|------------------------------------------------------|-----------------------------------------------|
| 2007WT   | M         | A    | STXM       | rubbers                                              | filler migration                              |
| 2007WTT  | E         | A    | STXM       | soil                                                 | Organic carbon forms                          |
| 2008AA&  | M         | A    | STXM       | Compare to TEM-EELS                                  |                                               |
| 2008AG&  | B         | T    | STXM       | TiO <sub>2</sub> nanoparticles                       | Contrast agent tests                          |
| 2008AH   | P         | R    | STXM       |                                                      | Review of polymer X-ray microscopy            |
| 2008AL&  | B         | I    | STXM       | hepatocyte from human liver                          | Low energy X-ray fluorescence in STXM         |
| 2008BB&  | M         | A    | STXM       | PFB-F8BT organic solar cell films                    | Role of solvent                               |
| 2008BC&  | M,E       | A    | STXM       | Natural graphites                                    | Orientation and chemical variation            |
| 2008BG&  | E         | A    | STXM       | Carbonaceous material                                | FIB damage                                    |
| 2008BH&a | M, B      | A    | PEEM       | HSA, sub-6 peptide competitive adsorption on PS/PMMA |                                               |
| 2008BH&b | M         | T    | TXM        |                                                      | Differential interference contrast microscope |
| 2008BH&c | E, B      | A    | STXM       | Aerosol particles                                    | Distinguishing woodsmoke & diesel exhaust     |
| 2008BM&a | E         | A    | STXM       | Nanoscale arsenic                                    |                                               |
| 2008BM&b | M         | A    | STXM       | permalloy                                            | Mag. Vortex dynamics                          |
| 2008BU&  | M         | T    | STXM       | Silver corrosion                                     | Technique demonstration                       |
| 2008CL&  | M         | A    | PEEM       | Langmuir-Blodgett films                              | Phase segregation, SEEM contrast              |
| 2008DF&  | E         | A    | STXM       | Elemental carbon                                     |                                               |
| 2008DL&  | E         | A    | STXM       | Chlorhexidine – antimicrobial maps                   |                                               |
| 2008EGG  | B         | A    | TXM        | contact elements of insect attachment                |                                               |
| 2008FK&  | M         | A    | TXM        | Permalloy                                            | Vortex dynamics                               |
| 2008FT&  | M         | A    | STXM       | Gas filled PVA microballoons                         |                                               |
| 2008GFK  | M         | A    | PEEM       | Polyaniline/steel                                    | Corrosion protection                          |
| 2008GK&  | M         | A    | XPEEM      | Diamond film                                         | Low friction mechanism                        |
| 2008GM&  | B, M      | A    | STXM       | Au nanoparticles in skin                             |                                               |
| 2008GS&  | E         | A    | STXM       | Stardust                                             |                                               |
| 2008HB&  | M         | T    | TXM        | Test structure                                       | Simple Zernicke phase contrast                |
| 2008HBV  | M         | T    | TXM        |                                                      | Differential interference contrast optic      |
| 2008HD&  | P, M      | A    | STXM       | Acrylate/PS microsphere tomo; PET radiation damage   | comparison of STXM-NEXAFS and TEM-EELS        |
| 2008HD&b | E         | A    | STXM       | Cloud droplets                                       |                                               |
| 2008HH   | P         | R    | STXM, PEEM | comprehensive polymer review                         | Contains this biblio as supplement            |
| 2008HH&  | E         | A    | STXM       | <i>Pseudomonas Aeruginosa</i> & iron                 |                                               |
| 2008HJ&  | M         | A,T  | STXM       | Latex PS, p-MMA microspheres                         | tomography                                    |

| code     | materials | type | tech       | species                                                                    | Comments                                    |
|----------|-----------|------|------------|----------------------------------------------------------------------------|---------------------------------------------|
| 2008HT&  | M         | A    | PEEM       | Fluorocarbon / Ti stent                                                    | Reliability analysis                        |
| 2008JV&  | M         | I    | TXM        |                                                                            | Condenser design                            |
| 2008KW&  | M         | A    | STXM       | Water particulate matter                                                   | Quantification (size, chemistry)            |
| 2008LB&  | M, B      | A    | XPEEM      | Alb on PS/PMMA                                                             | pH effect                                   |
| 2008LG&  | P         | A    | STXM       | RuO <sub>2</sub> in Nafion fuel cell membrane                              |                                             |
| 2008LH&  | P,B       | A    | PEEM       | Peptide (sub-6) vs. protein (albumin)<br>competitive adsorption on PS/PMMA | Natural NEXAFS contrast                     |
| 2008LM&  | E         | A    | STXM       | Asian atmospheric aerosols                                                 |                                             |
| 2008LR&  | M         | A,I  | X-SNOM     | ZnO                                                                        | ESRF implementation of tip detection of XAS |
| 2008LS&  | E         | A    | STXM       | soil organics                                                              |                                             |
| 2008MD&  | E         | A    | STXM       | Atmospheric aerosols - metals                                              |                                             |
| 2008MK&  | E         | A    | STXM       | Aragonite in abalone nacre                                                 | Polarization; growth mechanism              |
| 2008MM&  | E         | A    | STXM       | Ferrihydrite & polysaccharides                                             | Alginate, xanthan spectra; multi-technique  |
| 2008MT&  | M         | A    | TXM        | Soil colloids                                                              |                                             |
| 2008MT&b | E         | A    | STXM       | Framboidal pyrite in biofilm                                               |                                             |
| 2008MW&  | M         | A    | STXM       | polyfluorene blends                                                        | Photovoltaic optimization                   |
| 2008MZ&  | E         | A    | STXM       | Aragonite in abalone nacre                                                 | Polarization; growth mechanism              |
| 2008NH&  | M         | A    | STXM       | Multi-wall carbon nanotubes                                                | Dichroism; quality evaluation (AD, vs, CVD) |
| 2008NM&  | B         | A    | STXM       | Lipid membranes (solid supported)                                          |                                             |
| 2008PM&  | B         | A    | TXM        | Tomography with NCXT                                                       |                                             |
| 2008RB&  | M         | I,A  | DIXH       | PS and Fe <sub>3</sub> O <sub>4</sub> spheres                              | First chemical (elemental) contrast         |
| 2008RT&  | M         | I    | STXM       | Pt-Ir-Co film - XMCD, TCNQ - XLD                                           | PoLux BL & STXM description                 |
| 2008SRW  | M         | I    | TXM        |                                                                            | Zone plate fabrication                      |
| 2008SS&  | M         | A    | STXM       | Fe-oxide catalyst                                                          | In situ, H <sub>2</sub> , 1 atm, T to 450 C |
| 2008TG&a | M         | A    | STXM       | Phase change microcapsules                                                 |                                             |
| 2008TG&b | E         | R    | TXM        |                                                                            |                                             |
| 2008TG&c | M         | A    | STXM       | N <sub>2</sub> filled PVA balloons in water                                |                                             |
| 2008TGR  | E         | A    | STXM       | Atmospheric aerosols                                                       |                                             |
| 2008ULF  | M         | R    | STXM, PEEM | Dichroic measurements                                                      |                                             |
| 2008VB&  | M         | A    | STXM       | permalloy                                                                  | Mag. Vortex dynamics                        |
| 2008VB&  | M         | I    | STXM/TXM   |                                                                            | high heat load Si zone plates               |
| 2008W    | M         | A    | STXM       | PMMA, PAN, PS, Fg, PEC                                                     | Lithography, chemically selective patterns  |
| 2008WA   | M         | A    | STXM       | graphite                                                                   | polarization calibration                    |
| 2008ZG&  | M         | A    | TXM        | Semiconductor circuits                                                     |                                             |



| code     | materials | type | tech      | species                             | Comments                                   |
|----------|-----------|------|-----------|-------------------------------------|--------------------------------------------|
| 2008ZM&  | M         | A    | STXM      | Biogenic aragonite                  | C 1s spectroscopy & pol. Dep.              |
| 2008ZYS  | M         | A    | TXM       | Semiconductor circuits              | non-destructive imaging                    |
| 2009AK&  | M, B      | I    | STXM      | NIST 2783 particulates, hepatocytes | Low energy X-ray fluorescence in STXM      |
| 2009AS   | M, P      | R    | STXM      | Magnetic & polymer applications     | review                                     |
| 2009AS&  | M         | A    | STXM      | Metal-carboxylates                  | C 1s spectroscopy & calc                   |
| 2009AW&  | M         | A    | STXM      | Polymer solar cells                 | Predicts hard X-rays will win out          |
| 2009AW&  | P         | A    | SXoXS     | Polymer trilayers                   |                                            |
| 2009BB&a | M         | I    | TXM       | design                              | Colorado State; EUV HH-laser               |
| 2009BB&b | P         | A    | STXM      | Ternary blend organic solar cells   |                                            |
| 2009BB&c | B         | A    | STXM      | sporopollen                         | Related to coalification & palaeobotany    |
| 2009BH&  | B         | A    | TXM       | Diatom, soil particles              | Stockholm compact lab-TXM                  |
| 2009BK&  | E         | A    | STXM      | Soot particles                      | Radiation damage in EELS                   |
| 2009BN&  | E         | A    | STXM      | Primitive dust particles in space   |                                            |
| 2009BU&b | M         | A    | STXM      | Ag corrosion by chloride            | In situ electrochemistry                   |
| 2009CB&  | B         | A    | STXM      | Polysaccharides, lignin, cellulose  | Plant cell wall analysis                   |
| 2009CC&  | B         | A    | TXM       | Vaccinia Virus                      | tomography                                 |
| 2009CF&  | E         | A    | STXM      | Fe-oxyhydride mineralization        | on polysaccharides                         |
| 2009CH&  | E         | A    | STXM      | Hydrocarbon, clay                   | Oil sands issues                           |
| 2009CP   | M         | A    | PEEM      | pyrite                              | Surface oxidation                          |
| 2009DL&  | E         | A    | STXM      | Chlorhexidine – antimicrobial maps  |                                            |
| 2009DT&  | E         | A    | STXM      | Organics in aerosols                |                                            |
| 2009FD&  | P         | A    | STXM      | Poly(2-vinylpyridine) microgels     | pH, electrolyte; wet cell                  |
| 2009GA&  | E         | A    | STXM      | Carbonaceous nanoglobules           | meteorites                                 |
| 2009GK&a | M         | I    | STXM      |                                     | Low energy X-ray fluorescence in STXM      |
| 2009GK&b | M, B      | I    | STXM      | Star pattern, hepatocytes           | Low energy X-ray fluorescence in STXM      |
| 2009GM&  | E         | A    | XPEEM     | Aragonite in abalone nacre          | Ordering kinetics                          |
| 2009GS&  | E         | I    | TXM       | soils                               | Stereoscopic methods                       |
| 2009GS&b | E         | A    | STXM      | Organic matter in comets            |                                            |
| 2009GT&  | E         | A    | TXM       | Haematite; clay suspensions         | Stereo imaging                             |
| 2009HB&a | M         | I    | TXM       | design                              | Stockholm compact lab-TXM                  |
| 2009HB&b | M         | I    | TXM       | phase contrast ZP optics            | Stockholm compact lab-TXM – phase contrast |
| 2009HB&c | B,M       | R    | STXM, CDI | Expect to limit at 10 nm            | Radiation damage limitations               |
| 2009HD&  | B,E       | A    | STXM      | Ni, Mn, Fe in Ni-loaded biofilm     | co-localized metals                        |

| code     | materials | type | tech   | species                                                                                                   | Comments                                   |
|----------|-----------|------|--------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 2009HG&  | M, B      | I    | TXM    | TiO <sub>2</sub> particles; cell;                                                                         | First real spectroscopy in TXM             |
| 2009HS&  | M         | T    | STXM   | Dealing with absorption saturation                                                                        | Ca compounds                               |
| 2009HSH  | M         | I    | TXM    | design                                                                                                    | Energetiq Technology, Inc.                 |
| 2009KG&  | B         | A    | STXM   | Aleurone cells, bio applications                                                                          | Low energy X-ray fluorescence in STXM      |
| 2009KI&  | M         | I    | STXM   | Mirror characterization                                                                                   |                                            |
| 2009KM&  | B,E       | A    | XPEEM  | Calcite sea urchin tooth                                                                                  | orientation                                |
| 2009LB&  | B         | A    | STXM   | Organics in 2.9 Gy stromalites                                                                            | Biogeo, compare to STEM-EELS               |
| 2009LH&a | P         | A    | STXM   | Polyurea capsules                                                                                         | Gradient mapping, mechanisms               |
| 2009LH&b | P         | A    | XPEEM  | PS-PLA blends                                                                                             | Comp to AFM                                |
| 2009LM&  | E         | A    | STXM   | aerosols                                                                                                  |                                            |
| 2009LM&  | B         | I    | TXM    | Yeast cells (S. Pombe)                                                                                    | Light microscopy & tomo complement         |
| 2009LP&  | B         | A    | STXM   | Spider silk – beta sheet orientation – effect of water                                                    |                                            |
| 2009LP&  | B, P      | A    | STXM   | N. clavipes silk                                                                                          | effect of humidity on alignment            |
| 2009LT&  | E         | A    | STXM   | aerosols                                                                                                  |                                            |
| 2009LW&  | B,M       | A    | XPEEM  | HSA adsorbed to PS-PLA                                                                                    |                                            |
| 2009LW&a | B         | A    | XPEEM  | Albumin on PS-PLA                                                                                         |                                            |
| 2009LW&b | B         | A    | STXM   | Albumin on PS-PMMA                                                                                        |                                            |
| 2009LW&c | B,M       | A    | XPEEM  | HSA adsorbed to Poly-lactide, PS blend                                                                    |                                            |
| 2009MA&  | B         | A    | X-PEEM | Sea urchin teeth                                                                                          | Dichroic mapping                           |
| 2009MB&a | B,E       | A    | STXM   | Iron biomineralization                                                                                    | Anoxic studies                             |
| 2009MB&b | B,E       | A    | STXM   | Vivianite reduction by bacteria                                                                           |                                            |
| 2009MGK  | M         | I    | STXM   | PS microspheres (test object)                                                                             | Image reconstruction (toward ptychography) |
| 2009MH&  | E         | A    | STXM   | Aerosols in Mexico city                                                                                   |                                            |
| 2009MJ&  | M         | A    | STXM   | PP /Montmorillonite Nanocomposites                                                                        |                                            |
| 2009MK&  | M         | A    | STXM   | (CpSiMe <sub>3</sub> ) <sub>3</sub> M-ECp* (M = Nd, U; E = Al, Ga; Cp* = C <sub>5</sub> Me <sub>5</sub> ) | Actinide structure by STXM spectroscopy    |
| 2009ML&a | B         | I    | TXM    | Yeast cells (S. Pombe)                                                                                    | tomography                                 |
| 2009MP&  | B         | A    | STXM   | wood                                                                                                      |                                            |
| 2009MT&  | E         | A    | STXM   | Pyrite in biofilm                                                                                         |                                            |
| 2009NA&  | E         | A    | STXM   | Stardust                                                                                                  |                                            |
| 2009NH&  | M         | A    | STXM   | Defects in MW-CNTs                                                                                        |                                            |
| 2009NS&  | E         | A    | STXM   | S-metabolizing - syntrophic                                                                               |                                            |
| 2009OD&  | E         | A    | STXM   | Biomineralization – calcite & bacteria                                                                    |                                            |

| code     | materials | type | tech       | species                                    | Comments                                                 |
|----------|-----------|------|------------|--------------------------------------------|----------------------------------------------------------|
| 2009OKU  | M         | A    | STXM       | ferrocene and related compounds            |                                                          |
| 2009OWHa | E         | A    | STXM       | Calcite biomineralization in cyanobacteria | Grid tomography                                          |
| 2009OWHb | E         | A    | STXM       | Calcite biomineralization in cyanobacteria | Grid tomography                                          |
| 2009PR&  | E         | A    | STXM       | Eu-humic acid complexes                    |                                                          |
| 2009RR&  | M         | I    | TXM        |                                            | Higher order ZP focusing                                 |
| 2009RS&  | B         | I    | DIXH       | diatom                                     | Fs coherent imaging at 140 eV                            |
| 2009SA&  | E         | A    | STXM       | Stardust                                   |                                                          |
| 2009SB&  | M         | I    | TXM        | design                                     | Accel: Electric discharge source                         |
| 2009SC   | M         | I    | TXM        | Test patterns                              | Hefei NSRL instrument                                    |
| 2009SS&  | M         | A    | STXM       | Fischer Torpsch catalyst (Fe)              | in situ operation (, H <sub>2</sub> , 1 atm, T to 450 C) |
| 2009SW&  | P         | A    | RSoXS      | polymers                                   |                                                          |
| 2009SW&  | M         | R    | RSoXS      | Polymer tri-layers                         |                                                          |
| 2009TF&  | M         | A    | STXM       | Gas filled PVA microballoons               |                                                          |
| 2009TF&b | E         | A    | STXM       | Fe(II) in carbonmatrices                   |                                                          |
| 2009TI&  | B         | A    | TXM        | Plankton in Lake Biwa (eutrophic)          | COD, BOD                                                 |
| 2009TS&  | E         | A    | TXM        | soils                                      | Stockholm compact lab-TXM                                |
| 2009UM&  | B         | A    | TXM        | <i>Candida albicans</i>                    | Fungae tomography                                        |
| 2009WA&  | M         | A    | RSoXS      | Solar cell interfaces                      |                                                          |
| 2009WB&a | P         | A    | STXM       | Rad. Dmg in PET                            | Comp. to TEM-EELS                                        |
| 2009WB&b | M         | A    | STXM       | P3HT:PCBM blend films                      | Solar cells                                              |
| 2009WG&  | P         | A    | STXM       | Conjugated Polymer Bilayers                | Interfacial widths                                       |
| 2009WM&  | P         | A,T  | PEEM, STXM | PS, PMMA, Fg                               | radiation damage                                         |
| 2009WR&  | M         | I    | TXM        |                                            | Stacked zone plates                                      |
| 2009WV&  | M         | A    | STXM       | permalloy                                  | Vortex core dynamics                                     |
| 2009YT&a | B         | A    | TXM        | chromosomes                                |                                                          |
| 2009YT&b | B         | A    | TXM        | Immuno-labelled cells                      |                                                          |
| 2009ZH&a | M         | A    | TXM        | Electronic interconnects                   |                                                          |
| 2009ZH&b | M         | A    | TXM        | Copper interconnects                       |                                                          |
| 2010AE&  | M         | A    | STXM       | FeGd ML on nanospheres                     |                                                          |
| 2010AH&  | M         | A    | XPEEM      | Pentlandite, Pyrrhotite, Chalcopyrite      | compared to TOF-SIMS                                     |
| 2010AL&  | M         | A    | STXM       | Nanosphere magnets                         | out-of-plane magnetized                                  |
| 2010BA&  | E, B      | A    | XPEEM      | Calcium-organic composites                 | Paleobotany, coal formation                              |

| code     | materials | type | tech       | species                                                     | Comments                                     |
|----------|-----------|------|------------|-------------------------------------------------------------|----------------------------------------------|
| 2010BB&  | E         | A    | STXM       | Fossils in pyrite                                           | Organic residues                             |
| 2010BC&  | M         | A    | STXM       | La <sub>2</sub> U <sub>2</sub> Se <sub>9</sub>              |                                              |
| 2010BG&  | M         | A    | STXM       | Metal corrosion of nafion in fuel cell                      | In situ electrochemistry                     |
| 2010BM&  | E         | A    | STXM       | phototrophic iron-oxidizing bacterium                       | Fe biomineralization                         |
| 2010BRP  | E         | A    | STXM       | Soot particles                                              |                                              |
| 2010BV&  | M         | A    | STXM       | pentacene                                                   | In a FET                                     |
| 2010BV&a | M         | A    | STXM       | Pentacene FET                                               | Grain orientation                            |
| 2010BV&b | M         | A    | STXM       | Pentacene FET                                               | Grain orientation                            |
| 2010BW&  | P, B      | A    | STXM, PEEM | PEO, albumin adsorption                                     |                                              |
| 2010BY&  | M         | A    | STXM       | NaReO <sub>4</sub> – O 1s spectrum                          | FY, TEY, I-t (STXM) comparison               |
| 2010CF&  | E         | A    | STXM       | Iron oxidizing bacteria M. ferrooxydans                     | Polysaccharides in stalks                    |
| 2010CG   | E         | A    | XPEEM      | pyrite                                                      | Oxidation & weathering                       |
| 2010CG&  | P         | A    | STXM       | Polymer-fullerene (organic solar cell)                      | Miscibility                                  |
| 2010CH&  | P         | A    | PEEM       | Fluorocarbon coatings on implants                           |                                              |
| 2010CK&  | P         | A    | STXM       | HSQ                                                         | Radiation damage spreading                   |
| 2010DA&  | M         | A    | SPEM       | Pt on Gas Diffusion Layer                                   | PEM-FC                                       |
| 2010DL&  | M         | I    | SPEM       |                                                             | Elettra SPEM (3.2L) beamline                 |
| 2010F    | M         | R    | TXM        | (Co <sub>x</sub> Cy <sub>v</sub> ) <sub>z</sub> , permalloy | Spin dynamics                                |
| 2010FG&  | M         | A    | STXM       | Defects mapping in carbon nanotubes                         |                                              |
| 2010G    | M         | R    | TXM, STXM  |                                                             | Nanoscience applications review              |
| 2010GN&  | E         | A    | STXM       | Organic nanoglobules                                        |                                              |
| 2010GS&  | M         | R, A | STXM       | Fe catalysts                                                | In situ; review comparing to TEM-EELS        |
| 2010GT   | E         | A    | STXM       | Aerosol particles                                           | Hygroscopic effects                          |
| 2010HB&  | P, M      | A    | STXM       | pentacene based P-FET                                       | In situ operating device                     |
| 2010HC&  | M         | I    | STXM       |                                                             | Electron yield detection                     |
| 2010HO&  | E         | A    | STXM       | Acidovorax cells As / Fe                                    | As binding mechanisms                        |
| 2010HR   | E         | A    | STXM       | Classification of aerosol organics                          |                                              |
| 2010HT&  | E,B       | A    | STXM       | Acidovorax cells As / Fe                                    | X-ray fluorescence yield stacks              |
| 2010HWO  | E         | A    | STXM       | CaCO <sub>3</sub> S. leopolensis Biomineralization          | STXM spectro-tomography                      |
| 2010JR&  | M         | A    | XPEEM      | GaAs nanowires                                              |                                              |
| 2010KA&  | M         | I    | STXM       |                                                             | Stxm5321 design                              |
| 2010KB&  | M         | A    | STXM       | Pentacene, per-F-pentacene on PEN                           | Crystal ordering in thin films               |
| 2010KM&  | M         | A    | STXM       |                                                             | Magnetic dynamics: pulsed chirality reversal |
| 2010KN&  | E         | A    | STXM       | biochar                                                     |                                              |

| code     | materials | type | tech            | species                                                           | Comments                                                |
|----------|-----------|------|-----------------|-------------------------------------------------------------------|---------------------------------------------------------|
| 2010KW&  | E         | A    | STXM            | Ice formation on anthropogenic NP                                 |                                                         |
| 2010La   | B         | A    | STXM            | MV-1 MTB, MMP                                                     | XMCD of single magnetosomes                             |
| 2010Lb   | B,M       | A    | XPEEM           | HSA PS-PMMA-b-PAA, HSA / PS-PMMA-b-PAA, HSA/PS-PLA; Ubq/PEO-ppAA, | Protein-polymer interactions                            |
| 2010LBH  | R, P      | A    | XPEEM, STXM     | HSA, Fg, peptides adsorbed on : PS/PMMA, PS/PEO, PS/PLA           | Protein – polymer adsorption in context of biomaterials |
| 2010Lc   | M         | A    | STXM            | Aromatic, aliphatic                                               | Microcapsule synthesis methods                          |
| 2010LH&a | B,E       | A    | STXM            | MV-1 magnetotactic bacteria                                       | XMCD of individual magnetosomes                         |
| 2010LH&b | P, B      | A    | PEEM            | PEO, albumin adsorption                                           |                                                         |
| 2010LHS  | P         | A    | STXM            | Polymer capsules                                                  |                                                         |
| 2010LS&  | M         | A    | TXM             | nanostructured sulfated zirconias                                 |                                                         |
| 2010LT&  | M, P      | A    | PEEM            | Fluorocarbon coatings on stainless steel                          |                                                         |
| 2010LW&a | P         | A    | PEEM            | Cross-linked PEO                                                  | PETA at levels >5% destroys protein repellancy          |
| 2010LW&b | B,P       | A    | XPEEM           | HSA adsorbed to PS-PEO(x-link)                                    |                                                         |
| 2010Ma   | E,M       | R    | PEEM, SPEM      | Ge/Au; SnO <sub>2</sub> nanowires, Co np, abalone                 | Rules for efficient spectromicroscopy                   |
| 2010MA&  | P         | A    | STXM            | Ferroelectric polymers                                            |                                                         |
| 2010Mb   | M         | A    | STXM            | Actinide materials                                                | Technique comparison                                    |
| 2010ME&  | B,E       | A    | XPEEM           | Protein template to aragonite in nacre                            | biomineralization                                       |
| 2010MG&  | B         | I, T | CXDI, FTH, DIXH | diatom                                                            | Fs coherent imaging at 140 eV                           |
| 2010MH&  | M         | A    | STXM            | Aerosol particles                                                 | Automated analysis                                      |
| 2010MJ&  | P         | A    | STXM            | PP/MMT/SEBS polymer nanocomposite                                 |                                                         |
| 2010MK&  | M         | I    | STXM            |                                                                   | Ptychography set-up                                     |
| 2010MN&  | E         | A    | STXM            | aerosols                                                          |                                                         |
| 2010MT&a | B,E       | A    | XPEEM           | asp2 peptide in calcite (CaCO <sub>3</sub> )                      | biomineralization                                       |
| 2010MT&b | E         | A    | STXM            | aerosols                                                          |                                                         |
| 2010MT&c | E         | A    | STXM            | aerosols                                                          |                                                         |
| 2010NK&  | E         | R    | STXM            |                                                                   | Soil organic-mineral interactions                       |
| 2010NM&a | B,E       | R    | STXM            | Bacterial biofilms                                                | Compare to LSCM, nmr                                    |
| 2010NM&b | E         | A    | STXM            | Artificial cometary ice                                           |                                                         |
| 2010NW&  | M         | A    | STXM            | SW-CNT; dodecyl-functionalization                                 | Dichroism of SWCNT like that in MWCNT                   |
| 2010OR&  | M         | R    | XPEEM           | Time & energy- resolved PEEM                                      | 108 ps time resolution, xmcd dynamics; use              |

| code     | materials | type | tech      | species                                                                | Comments                                    |
|----------|-----------|------|-----------|------------------------------------------------------------------------|---------------------------------------------|
|          |           |      |           |                                                                        | for chromatic aberration correction         |
| 2010PG&  | E         | A    | STXM      | Graphite in quartz-pyroxene                                            |                                             |
| 2010PR&  | E         | A    | STXM      | Eu(III) – humic acid aggregates                                        | Luminescence yield correlated; calculations |
| 2010PT&  | E         | A    | STXM      | Playa salts – nucleating clouds                                        |                                             |
| 2010RD&  | E         | A    | STXM      | Cloud droplets                                                         |                                             |
| 2010RF&  | B,E       | A    | STXM      | Amorphous CaCO <sub>3</sub>                                            |                                             |
| 2010RH&  | E         | A    | STXM      | Particles in ocean bubble bursts                                       |                                             |
| 2010RL   | E         | A    | STXM      | roots                                                                  | Nutrient flow                               |
| 2010SD&  | M, E      | A    | STXM      | Organics in meteorites                                                 |                                             |
| 2010SG&  | B         | A, I | TXM       | mouse adenocarcinoma cells                                             | First tissue tomo by TXM, 70 nm resolution  |
| 2010SK&  | M         | A    | TR-PEEM   | In Co/Cr/Fe(0 0 1) pads                                                | Vortex motion                               |
| 2010SM&  | M         | I    | PEEM      |                                                                        | Optics – 4 nm in LEEM                       |
| 2010SP&  | M         | A    | STXM      | Memresistive device                                                    | Identify functional channels                |
| 2010SR&a | M         | I    | SP-STXM   | Scanning probe enhanced STXM                                           | Instrument description                      |
| 2010SR&b | E         | A    | STXM      | Organic aerosol particles                                              |                                             |
| 2010SR&c | M         | I    | TXM       |                                                                        | High efficiency zone plates                 |
| 2010SW&a | M         | A    | STXM      | N in fuel cell membranes                                               |                                             |
| 2010SW&b | M         | A    | RSoXS     | Heterojunction photovoltaics                                           |                                             |
| 2010TC   | M         | R    | STXM      | Permalloy vortices; spin valves                                        | Magnetization dynamics                      |
| 2010TG&  | E         | A    | TXM       | Nanoparticles in water                                                 |                                             |
| 2010TLR  | E         | A    | STXM      | Carboxylic acids - aerosols                                            |                                             |
| 2010TP&  | M         | A    | STXM      | lyotropic chromonic liquid crystals                                    | Effect of additives                         |
| 2010TS&  | B         | R    | TXM, STXM | Soil                                                                   | Review of soil & environmental apps.        |
| 2010WC&  | M         | A    | STXM      | Montmorillonite exchange Na <sup>+</sup> /NH <sub>4</sub> <sup>+</sup> |                                             |
| 2010WM   | M         | A    | STXM      | PS-PMMA; polyfluorene                                                  | TEY, transmission                           |
| 2010WR&  | M         | I    | TXM       | 15 nm Zone plate development                                           |                                             |
| 2010WZ&  | P         | A    | STXM      | PE orientation                                                         |                                             |
| 2010YA&  | E         | A    | STXM      | Organics in meteorites                                                 |                                             |
| 2010YW&  | M, P      | A    | STXM      | Organic photovoltaics                                                  | Interface roughness / annealing             |
| 2010ZW&a | M         | A    | STXM      | N in carbon nanotubes                                                  |                                             |
| 2010ZW&b | M         | A    | STXM      | RuO <sub>2</sub> /CNT sensors                                          |                                             |
| 2011BA&  | M         | A    | SPEM      |                                                                        |                                             |
| 2011BG&  | M         | A    | STXM      | Ni corrosion in ionic liquid                                           | XRF and in situ electrochem                 |
| 2011BH&a | E         | A    | STXM      | Organics in shale                                                      |                                             |

| code     | materials | type | tech  | species                                                 | Comments                                   |
|----------|-----------|------|-------|---------------------------------------------------------|--------------------------------------------|
| 2011BH&b | M         | A    | STXM  |                                                         | Surface-sensitive TEY                      |
| 2011BM&a | E         | A    | STXM  | coral                                                   | Dichroic mapping                           |
| 2011BM&b | M         | A    | STXM  | Fuel cells                                              | In situ electrochem; XRF                   |
| 2011BS&a | M         | A    | STXM  | Mapping gas & liquid water in fuel cells                |                                            |
| 2011BS&b | M         | A    | STXM  | PFB-F8BT organic solar cell films                       | Composition & morphology                   |
| 2011BT&  | M         | A    | STXM  | SOFC interconnects                                      |                                            |
| 2011CB&  | M         | A    | STXM  | MEH-PPV:Porphyrim:PCBM solar cells                      |                                            |
| 2011CC&  | E,B       | A    | STXM  | Fe biomineralization                                    |                                            |
| 2011CG&  | E         | A    | STXM  | Chitin-protein complexes                                |                                            |
| 2011CH&  | M         | A    | XPEEM |                                                         | SEEM in energy filtered XPEEM              |
| 2011CH&b | E         | A    | STXM  |                                                         | chondritic and cometary organic solids     |
| 2011CS&  | M         | A    | STXM  |                                                         | Fe film ion-beam patterning                |
| 2011DG&  | M         | A    | SPEM  | high O SiO <sub>x</sub> protrusions on SiO <sub>2</sub> |                                            |
| 2011DQ&  | B         | A    | TXM   | myelinated axon                                         | TXM tomo coupled to ESRF XRF-STXM          |
| 2011DV&  | M         | A    | STXM  | Co in cement                                            |                                            |
| 2011GB&  | M         | A    | TXM   | TiO <sub>2</sub> nano ribbons                           | First TXM spectromicroscopy, dichroism     |
| 2011GK&  | M         | A    | STXM  | Fe – Au galvanic couple                                 | in situ Electrochem                        |
| 2011GLT  | M         | A    | STXM  | Malonic acid particles                                  | Keto-enol tautomerism                      |
| 2011GW   | B         | R    | XPEEM |                                                         | Biomineralization review                   |
| 2011GYC  | M         | A    | XPEEM | Mollusk calcite                                         | C 1s Linear dichroism                      |
| 2011HB&  | E         | A    | STXM  | Organics in Tagish lake meteorite                       |                                            |
| 2011HF&  | M         | A    | STXM  | GaN nanowires                                           |                                            |
| 2011IW&  | B         | A    | STXM  | Latarcin A antimicrobial peptide                        |                                            |
| 2011KD&  | M         | T    | SPEM  | Graphene windows allow liquid PES                       |                                            |
| 2011KM&  | B,M       | A    | PEEM  | Sea urchin teeth                                        | Sharpening mechanism                       |
| 2011KN&  | E         | A    | STXM  | Organics in soil                                        |                                            |
| 2011LD&b | E         | A    | STXM  |                                                         | Aerosols from burning                      |
| 2011LH&  | B         | A    | STXM  | Anoplin (antimicrobial-peptide)                         | Lipid interactions                         |
| 2011LHa  | P         | A    | STXM  | PMMA                                                    | Source of ‘damage spreading’ is PSF        |
| 2011LHb  | E         | R    | STXM  | chlorhexidine                                           | Organic contaminants in environment        |
| 2011LHc  | T         | T    | STXM  | PMMA                                                    | point spread function mapping at 3 STXMs   |
| 2011LM&a | P         | A    | STXM  | polyurea microcapsules                                  | Surface modification for triggered release |
| 2011LM&b | B         | A    | XPEEM | Rat tendon collagen                                     | C 1s Linear dichroism                      |
| 2011LR&  | M         | A    | STXM  | Monopole magnetic defects                               |                                            |

| code     | materials | type | tech        | species                                                                                                             | Comments                              |
|----------|-----------|------|-------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 2011MC&  | B         | A    | STXM        | CoFe particles in fibroblasts                                                                                       | XRF mapping                           |
| 2011MJ&  | P         | A    | STXM        | Polypropylene-clay-elastomer                                                                                        | Compatibilizer mapping                |
| 2011MM&a | P         | A    | STXM        | Reverse osmosis filtration membranes                                                                                |                                       |
| 2011MM&b | B, E      | A    | STXM        | Protein & peptidoglycan in cell walls                                                                               |                                       |
| 2011N    | M         | A    | STXM        | MWCNT, SWCNT                                                                                                        | Dichroism, functionalization          |
| 2011NM&  | E         | A    | STXM        | Organic residues in ice analogs                                                                                     | Star-dust related                     |
| 2011NW&  | M         | A    | STXM        | CoTb, FePt, FePt np                                                                                                 | Surface-sensitive TEY                 |
| 2011OG&  | M         | A    | STXM        | Carbon black sorbents                                                                                               |                                       |
| 2011PC&  | M         | A    | STXM        | Diamonoid aerogel                                                                                                   |                                       |
| 2011PG&a | E         | A    | STXM        |                                                                                                                     | Graphite in old banded-Fe formations  |
| 2011PG&b | M         | A    | STXM        | asbestos                                                                                                            |                                       |
| 2011PW&  | M         | A    | STXM        | Wadsley-type Tunnel Bronze                                                                                          |                                       |
| 2011SB&  | M         | A    | STXM        | Ionomer in cathode                                                                                                  | Fuel cell optimization                |
| 2011SB&b | M         | A    | STXM        | Uranium compounds                                                                                                   |                                       |
| 2011SC&  | M         | A    | STXM        | MWCNT and GO nanoribbons                                                                                            |                                       |
| 2011SD&  | M         | A    | STXM        | VO <sub>2</sub> Nanowires                                                                                           |                                       |
| 2011SG&  | B         | A    | Spectro-TXM | Smooth muscle cells                                                                                                 | good C 1s, Ca 2p spectroscopy         |
| 2011SH&  | M         | A    | STXM        | Photonic crystals                                                                                                   |                                       |
| 2011SS&  | M         | A    | STXM        | memresistor                                                                                                         | Switching effects                     |
| 2011TL&  | M         | A    | STXM        | Cobalt Diamond-like films                                                                                           |                                       |
| 2011TS&  | E         | A    | STXM        |                                                                                                                     | Aerosols from burning                 |
| 2011US&  | B         | A    | TXM         | <i>Schizosaccharomyces pombe</i> ,, <i>Candida albicans</i> <i>coff1-22</i> mutant strain of <i>S. cerevisiae</i> . | Cryotomography, segmentation          |
| 2011VK&  | M         | A    | STXM        | permalloy                                                                                                           | Mag. Dynamics coupled oscillations    |
| 2011VR&  | M         | A    | STXM        | Co <sub>2</sub> FeAl <sub>0.4</sub> Si <sub>0.6</sub> Heusler alloy                                                 | Spin structure                        |
| 2011WH&A | M         | A    | PEEM        | Magnetoelectric antiferromagnet                                                                                     |                                       |
| 2011WH&b | B         | A    | STXM        | Sulfur(0) in S-metabolizing bacteria                                                                                | tomography                            |
| 2011WK&  | B         | A    | STXM        | Anoplin antimicrobial peptide                                                                                       |                                       |
| 2011WK&  | B, P      | A    | STXM        | Anoplin antimicrobial peptide/lipid membrane interactions                                                           |                                       |
| 2011WM   | M         | A    | STXM        | Redox of Pd nanoparticles                                                                                           |                                       |
| 2011WS&  | M         | A    | STXM        | Magnetic/non/magnetic structures                                                                                    | AFM coupling of vortex states         |
| 2011WSM  | P         | A    | STXM        | poly(9,9'-dioctylfluorene-co-                                                                                       | Molecular orientation & order mapping |



| code     | materials | type | tech                   | species                                           | Comments                                                |
|----------|-----------|------|------------------------|---------------------------------------------------|---------------------------------------------------------|
|          |           |      |                        | benzothiadiazole) (F8BT)                          |                                                         |
| 2011WZ&  | M         | A    | STXM                   | SnO <sub>2</sub> -CNT humidity effects            |                                                         |
| 2011YK&  | E, B      | A    | XPEEM                  | Biological nanoparticles                          | Space filling                                           |
| 2011YP&  | M         | A    | STXM                   | Spin driven oscillator                            |                                                         |
| 2011ZW&a | M         | A    | STXM                   | Water on SnO <sub>2</sub> carbon nanotubes        | Humid cell                                              |
| 2011ZW&b | M         | A    | STXM                   | Single sheet graphene oxide NEXAFS                |                                                         |
| 2011ZW&c | M         | A    | STXM                   | Nanoparticle compatibilizers                      |                                                         |
| 2011ZX&  | M         | A    | STXM                   | Functionalized CNT                                |                                                         |
| 20120SS& | M         | A    | SPEM                   | SnO <sub>2</sub> electronic noses                 | Alcohol beverage discrimination                         |
| 2012AS&  | M         | A    | STXM                   | Alumina zeolites                                  |                                                         |
| 2012B    | M         | R    | XPEEM                  |                                                   | Historical perspective LEEM, PEEM etc                   |
| 2012BA&  | M         | R    | STXM, SPEM             | PEM-FC metal electrodes; SOFC                     | Review of fuel cell in situ studies                     |
| 2012BG&a | M         | A    | STEM                   | Mn, MnO <sub>2</sub>                              | In situ electrochem                                     |
| 2012BG&b | M         | A    | STXM                   | Liquid crystal - Au corrosion                     | In situ, X-ray fluorescence                             |
| 2012BH&a | E         | A    | STXM                   | Organic-rich shales                               |                                                         |
| 2012BH&b | M         | A    | TXM                    | NaTiO <sub>3</sub> nanorods                       | Spectroscopy & linear dichroism                         |
| 2012BL&  | M         | T    | STXM                   | Knife-edge (FIB met glass)                        | Resolution profile                                      |
| 2012BM&  | M, P      | A    | STXM                   | N-ligands to Pt                                   | Fuel cell degradation                                   |
| 2012BS&  | M         | A    | STXM                   | Cathode porosity in PEM-FC                        | Spectro-tomography                                      |
| 2012CA   | P         | A    | STXM                   | P3HT, P61BM organic photovoltaics                 |                                                         |
| 2012CB&  | E,M       | A    | STXM                   | Geobacter – external magnetite                    | XMCD                                                    |
| 2012CC&  | M         | R    | RSoXS                  | Organic films                                     | Polarized X-ray scattering (SAXS dichroism)             |
| 2012CF&  | T         | T    | STXM                   |                                                   | 10 nm resolution                                        |
| 2012CI&  | M         | A    | STXM                   | Cr(VI) reduction by aerobic bacteria              |                                                         |
| 2012DC&  | M         | T    | XPEEM                  |                                                   | Cryo PEEM-2 aberration corrected                        |
| 2012FT&  | M         | A    | XPEEM                  | LaFeO <sub>3</sub>                                | Antiferromagnetic domains                               |
| 2012G    | E, B      | R    | XPEEM                  | Carbonate biominerals                             | Biomineralization; PIC                                  |
| 2012GB&  | M         | A    | TXM                    | TiO <sub>2</sub>                                  | Spectroscopy & dichroism                                |
| 2012GK&  | E, B      | R    | XPEEM                  | Amorphous Calcium carbonate                       | Phase transitions                                       |
| 2012H    | MEB       | R    | TXM, STXM, SPEM, XPEEM | many                                              | Review of all soft X-ray techniques & many applications |
| 2012HC&  | M         | A    | STXM                   | PTB <sub>7</sub> :PC <sub>71</sub> BM solar cells | Domain composition                                      |
| 2012HK&  | E         | R    | STXM                   | Natural organics, ferric iron interact            |                                                         |
| 2012HL&  | B,M       | A    | XPEEM                  | Collagen; HSA/PS-PMMA; HSA / PS-                  | Protein-polymer interactions                            |

| code     | materials | type | tech        | species                                                           | Comments                                  |
|----------|-----------|------|-------------|-------------------------------------------------------------------|-------------------------------------------|
|          |           |      | STXM        | PMMA-b-PAA, HSA/PS-PLA; HSA / PIPA-SAN&polyurethane; Ubq/PEO-ppAA |                                           |
| 2012HS&  | M         | A    | STXM        | Colloidal photonic crystals                                       | tomography                                |
| 2012I    | M         | A    | XPEEM       | H <sub>2</sub> , O <sub>2</sub> react with VO <sub>x</sub>        | Pattern formation                         |
| 2012K    | B         | A    | STXM        | MV-1Magnetotactic bacteria                                        | XMCD improvements, reversal               |
| 2012KG&  | M         | A    | XPEEM       | Diamond like films                                                |                                           |
| 2012KL&  | E         | A    | STXM        | MV-1 magnetotactic bacteria                                       |                                           |
| 2012KO&  | M         | T    | XPEEM       | instrument                                                        | Pump probe dynamics                       |
| 2012L    | M         | A    | STXM        | PMMA, stearic acid                                                | Lithography, nanofluidics, dosimetry      |
| 2012LD&a | E         | A    | STXM        | Cu nanoparticles, river biofilms                                  |                                           |
| 2012LH&a | B, M      | A    | XPEEM       | HSA PS-PMMA-b-PAA                                                 | Protein-polymer interactions              |
| 2012LH&b | M, I      | I    | STXM        | PMMA                                                              | Detector efficiency & dosimetry           |
| 2012LHa  | M, T      | T    | STXM        | Stearic acid melting                                              | Heating not an issue in STXM              |
| 2012LHb  | M, T      | T    | STXM        | PMMA, PMGI layers                                                 | Nanofluidic lithography                   |
| 2012LHc  | M         | A    | STXM        | carbon                                                            | Contamination rates for EUV               |
| 2012LHd  | M, B      | A    | XPEEM, STXM | Apb, sub-6 on PS/PM-b-PAA                                         | Review and new system                     |
| 2012LK&  | M         | A    | XPEEM       |                                                                   | Magnetic vectometry                       |
| 2012LM&  | E, B      | A    | XPEEM       | collagen                                                          | Xanes anisotropy                          |
| 2012ML   | M         | A    | XPEEM       |                                                                   | Angle resolved XPEEM                      |
| 2012MZ&  | M         | A    | STXM        | TiO <sub>2</sub> nanocrystals on C-film                           |                                           |
| 2012NY   | M         | A    | XPEEM       | Cs/Ni/Cu(001)                                                     | MCD laser                                 |
| 2012OG   | E, B      | A    | XPEEM       | Pinctada margaritifera. mollusks                                  | Biomineralization; PIC                    |
| 2012OH&  | M         | A    | XPEEM       | 18 nm Fe nanocubes                                                | T-dependent magnetism                     |
| 2012OK&  | E, B      | A    | XPEEM       | Pinctada margaritifera. mollusks                                  | T,P effects on ultrastructure             |
| 2012PO&  | E         | A    | STXM        | BoFeN1 anaerobic Fe eating bacteria                               | Green rust                                |
| 2012PR&  | M         | A    | STXM/SPM    | PS-P3HT, Cr/Ti; CoPt ML                                           | Combined nano-XAS,AFM                     |
| 2012RB&  | M         | A    | STXM        | Semicond & metal SWCNT                                            | Linear dichroism; C 1s pi* fine structure |
| 2012SB&  | M         | A    | STXM        | Ionomer mapping in PEM-FC                                         |                                           |
| 2012SC&  | M         | A    | STXM        |                                                                   | Magnetic vortex dynamics                  |
| 2012SE&  | M         | A    | STXM        | PTB <sub>7</sub> :PC <sub>71</sub> BM solar cells                 | Oligomeric compatibilizers                |
| 2012SL&a | E         | A    | STXM        | Organics in soil                                                  |                                           |
| 2012SL&b | E         | A    | STXM        | Organics in soil                                                  |                                           |



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### A.P. Hitchcock

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