

INTRODUCTION/SUMMARY.....	XIX
2002: THE YEAR IN REVIEW.....	XIX
WHO TEAMED UP WITH WHOM?	XIX
<i>SUMMARY TABLE 1 PARTNERSHIPS ESTABLISHED DURING 2002</i>	XXI
WHERE DID INVESTORS PUT THEIR CASH?	XXII
<i>SUMMARY TABLE 2 RECIPIENTS OF FINANCING FROM INSTITUTIONAL OR</i> <i>PRIVATE INVESTORS DURING 2002</i>	XXIII
WHAT'S THE GOVERNMENT UP TO?.....	XXIII
<i>SUMMARY TABLE 3 GOVERNMENT FUNDING AWARDS COVERED IN</i> <i>NANOPARTICLE NEWS DURING 2002</i>	XXIV
BCC ONLINE SERVICES.....	XXV
BIOTECHNOLOGY NEWS	1
OXONICA PUSHES FORWARD WITH BIOLABEL TECHNOLOGY	1
SELF-ASSEMBLY EXPLOITED TO MIMIC BONE STRUCTURE.....	2
DRUG DELIVERY WITH NANO CAPO4 YIELDS POSITIVE RESULTS.....	3
DRUG DELIVERY ... RESULTS (CONTINUED).....	4
NANOCAPSULES TARGET DAMAGED CELLS	5
NANOCAPSULES TARGET DAMAGED CELLS (CONTINUED).....	6
LINKED BIOMOLECULES CONTROLLED REMOTELY.....	7
LINKED BIOMOLECULES CONTROLLED REMOTELY (CONTINUED).....	8
SIZE REDUCTION YIELDS STRONGER DRUG PARTICLES	9
ORASURE SENDS FDA ADDITIONAL DATA	10
DNA DETECTION TECHNOLOGY BOASTS HIGH SENSITIVITY	11
MAGNETIC FLUIDS COULD REPAIR DAMAGED RETINAS.....	11
MAGNETIC FLUIDS COULD REPAIR DAMAGED RETINAS (CONTINUED).....	12
CAPABILITIES OF DRUG CARRIER PARTICLES BROADENED	13
MRI CONTRAST AGENT HAS MULTIPLE FUNCTIONS	14
NANO SILVER WILL TREAT SKIN AND RESPIRATORY DISEASES	15
NANO SILVER ... RESPIRATORY DISEASES (CONTINUED)	16
MAGNETIC PARTICLES DELIVER DRUGS TO GI TRACT.....	17
MAGNETIC PARTICLES DELIVER DRUGS TO GI TRACT (CONTINUED).....	18
LANTHANUM CERAMIC PARTICLES ENABLE PHOSPHATE REMOVAL	19
X-RAY IMAGES GENERATED FROM NANOTUBE CATHODES.....	20
X-RAY IMAGES GENERATED FROM NANOTUBE CATHODES (CONTINUED).....	21
MEDICAL USES EMERGE FOR MINI X-RAY TUBES	22
MRI TRANSFORMED INTO CANCER TREATMENT TOOL	23
QUANTUM DOTS HOME TO CANCEROUS TISSUES.....	24

ALTAIR MOVES AHEAD IN DRUG DEVELOPMENT.....	25
BIOTECH FIRMS MERGE TO ADVANCE CANCER TREATMENT TECHNOLOGY	26
BIOTECH FIRMS ... TREATMENT TECHNOLOGY (CONTINUED).....	27
NANOFIBERS ADD FUNCTIONALITY TO LIGHTWEIGHT PROTECTIVE GEAR	28
NANOFIBERS ADD ... PROTECTIVE GEAR (CONTINUED).....	29
CARBON NANOSTRUCTURES.....	30
SELF-ASSEMBLING NANOTUBES EXPLOITED AS SCAFFOLD.....	30
NASA PRODUCES NANOTUBE COMPOSITES FOR SPACE.....	31
NASA PRODUCES NANOTUBE COMPOSITES FOR SPACE (CONTINUED).....	32
NANOTUBES RAISE THERMAL CONDUCTIVITY OF EPOXY 125%	33
NANOTUBE TRANSISTORS OUTPERFORM SILICON.....	34
INFINEON CONTROLS GROWTH OF NANOTUBES ON SILICON.....	35
INFINEON CONTROLS ... ON SILICON (CONTINUED).....	36
ANI SIGNS NANOTUBE LICENSE WITH JAPANESE COMPANY	37
SYNTHESIZING NANOTUBES WITH UNPRECEDENTED CONTROL.....	38
SYNTHESIZING NANOTUBES ... CONTROL (CONTINUED).....	39
CHARACTERIZATION AND PROCESSING	40
GOLD PARTICLE GRADIENT ENGINEERED ACROSS SURFACE	40
VERSATILE NANOTUBES CAN FLUORESCCE TOO	41
QUANTUM DOTS A STEP TO PHOTON TURNSTILES.....	42
QUANTUM DOTS A STEP TO PHOTON TURNSTILES (CONTINUED).....	43
ETCHING/PASSIVATION ALLOWS PARTICLES TO FORM CONTACTS.....	44
NANOENGINEERING LEADS TO STRONG AND DUCTILE COPPER.....	44
NANOENGINEERING LEADS ... COPPER (CONTINUED).....	45
AFM DESIGNED WITH LOW NOISE PERFORMANCE.....	46
MALVERN INTRODUCES ANALYZER FOR WIDE PARTICLE SIZE RANGE.....	47
GERMAN SCIENTISTS REDEFINE MICROSCOPY AS “NANOSCOPY”	48
A STEP TOWARD NANOPARTICLE PRINTING.....	49
A STEP TOWARD NANOPARTICLE PRINTING (CONTINUED).....	50
COMMENTARY BY MINDY N. RITTNER, EDITOR.....	51
DESPITE CHIP DOWNTURN, CMP ARENA GOOD PLACE TO BE	51

NANOHYPE REACHES MEGA LEVELS: SEPARATING FACT FROM FICTION	52
IF IT SOUNDS TOO GOOD TO BE TRUE.....	53
IF IT SOUNDS TOO GOOD TO BE TRUE... (CONTINUED).....	54
NANOMATERIALS, ANTHRAX AND IRAQ.....	55
NATIONAL SECURITY NEEDS DRIVE NANOMATERIALS DEVELOPMENT.....	56
NATIONAL SECURITY ... DEVELOPMENT (CONTINUED).....	57
NATIONAL SECURITY ... DEVELOPMENT (CONTINUED).....	58
CONFERENCE REPORT NANOPARTICLES 2002	59
INTERNATIONAL ACTIVITIES.....	59
GLOBAL NANOMATERIALS MARKET FORECAST TO RISE AT 12.8% AAGR.....	59
SMALL, LARGE GERMAN FIRMS COMMERCIALIZING NANOMATERIALS	59
CHINESE GOVERNMENT INVESTS MILLIONS IN NANOTECH IN 2002	60
BIOTECHNOLOGY.....	60
DNA DETECTION ADVANCED WITH NANOPARTICLE PROBES	60
GOLD NANOCRYSTALS KEY TO TARGETED DRUG DELIVERY.....	61
ENGINEERED NANOGELS CAN REMOVE OVERDOSED DRUGS	61
ENERGY AND ENVIRONMENT	61
NANO-ELECTRODE MATERIALS POSE COMPETITION FOR LiCoO ₂	61
NANOSENSORS PROVIDE HIGHER SENSITIVITY, FASTER RESPONSE.....	62
USE OF PHOTOCATALYTIC TiO ₂ REQUIRES BETTER ENGINEERING.....	62
SINGLE STEP METHOD YIELDS AUTOMOTIVE CATALYSTS	62
NANOTUBES AND NANOWIRES.....	63
NANOTUBE MARKET EXPECTED TO REACH \$230M IN 2006	63
GOOD DISPERSION DEEMED CRITICAL TO NANOCOMPOSITE PROPERTIES.....	63
LARGE AREA NANOTUBE DISPLAYS NEAR COMMERCIALIZATION	64
SEMICONDUCTOR NANOWIRES MAKE SENSITIVE BIOSENSORS	64
ELECTRONIC, MAGNETIC & OPTICAL DEVICES.....	65

SUPER HIGH DENSITY HARD DISKS RELY ON SELF-ASSEMBLED PARTICLES.....	65
MINIATURIZATION IS A MARKET DEMAND FOR OPTICAL DEVICES	65
“PLUG AND PLAY” APPROACH IMPARTS FUNCTIONALITY TO SILICON	66
INDEX-MATCHED NANOCOMPOSITES DISPLAY SUPERIOR PROPERTIES.....	66
SELF-ASSEMBLY TECHNOLOGY	67
ELECTROSTATIC SELF-ASSEMBLY YIELDS UNIFORM NANOCOMPOSITES	67
MULTIFUNCTIONAL STRUCTURES FORMED VIA SELF-ASSEMBLY.....	67
BUSINESS AND COMMERCIALIZATION.....	67
KNOWING WHEN TO BRING A NEW TECHNOLOGY TO MARKET	67
PATENT ATTORNEY PROVIDES IP ADVICE FOR SMALL BUSINESSES	68
GOVERNMENT, PARTNERSHIPS FUND NANOTECH START-UPS	68
VENTURE CAPITAL FIRMS SCALE BACK FUNDING.....	68
ELECTRONICS, OPTOELECTRONICS AND MAGNETICS.....	69
NANO FERRITE POWDERS PRODUCED BY ALTERNATIVE TECHNIQUE.....	69
UNIFORM SNO ₂ LAYERS FOR GAS SENSOR APPLICATIONS	70
NANOSTRUCTURING ENABLES ULTRA-HIGH DENSITY MAGNETIC STORAGE	71
“PLUG AND PLAY” IMPARTS FUNCTIONALITY	72
“PLUG AND PLAY” IMPARTS FUNCTIONALITY (CONTINUED).....	73
NANOMAGNETICS SETS STORAGE DENSITY RECORD	74
NTERA AND DENSITRON COLLABORATE ON DISPLAYS	75
QUANTUM DOTS ENHANCE ERBIUM LUMINESCENCE.....	76
LOW-PRESSURE CVD YIELDS NANOCRYSTAL-BASED MEMORY	77
LOW-PRESSURE ... MEMORY (CONTINUED)	78
NANORODS AND POLYMERS FORM HYBRID SOLAR CELLS	79
NANORODS AND POLYMERS FORM HYBRID SOLAR CELLS (CONTINUED)	80
ANI DEMONSTRATES 14-IN.-DIAGONAL NANOTUBE DISPLAY	81
SUBNANOSCALE GOLD SYNTHESIZED FOR DEVICES	82
STRIPED NANOWIRES MIGHT ENABLE NEXT-GEN TRANSISTORS.....	83
BORON NANOWHISKERS SYNTHESIZED IN NANOTUBE ATTEMPT	84

BORON NANOWHISKERS ... ATTEMPT (CONTINUED)	85
METAL NANOPARTICLE ARRAYS GUIDE AND FOCUS LIGHT	86
METAL NANOPARTICLE ARRAYS GUIDE AND FOCUS LIGHT (CONTINUED).....	87
NANOANTENNA STRUCTURE PROMISES “SUPER LENS”	88
NANOANTENNA STRUCTURE PROMISES “SUPER LENS” (CONTINUED).....	89
NOVEL DESIGN PAVES THE WAY TO NANOELECTRONICS	90
NOVEL DESIGN PAVES THE WAY TO NANOELECTRONICS (CONTINUED).....	91
ENERGY, CATALYSIS AND ENVIRONMENT.....	92
MITSUBISHI CHEMICAL MOVES TO COMMERCIALIZE PHOTOCATALYST	92
SILICON NANOCRYSTALS SHOW EXPLOSIVE POTENTIAL	93
NANOMATERIALS ENABLE SOFC ADVANCEMENTS	94
CORE-SHELL PARTICLES SHOW MOLECULAR SENSING ABILITY.....	95
TiO ₂ NANOPARTICLES TO PLAY ROLE IN WATER PURIFICATION	96
TiB ₂ ENGINEERED FOR NEXT-GEN AIR BATTERIES	97
1-NM DIAMETER PT PARTICLES PRODUCED FOR FUEL CELLS	97
1-NM DIAMETER PT ... FUEL CELLS (CONTINUED).....	98
NANOCARBONS PROVIDE CLEAN ELECTRICITY	99
BERKELEY SPEARHEADS \$3M NANOGEOSCIENCE EFFORT.....	100
BERKELEY SPEARHEADS \$3M NANOGEOSCIENCE EFFORT (CONTINUED).....	101
INDUSTRY INSIGHT	102
TESTIMONY SUPPORTING THE 21ST CENTURY NANOTECHNOLOGY RESEARCH AND DEVELOPMENT ACT	102
TESTIMONY SUPPORTING ... ACT (CONTINUED)	103
RECAP OF SALIENT POINTS FROM TESTIMONY OF OTHER NANOTECH EXPERTS	104
LESSONS LEARNED IN LAUNCHING ADVANCED MATERIALS START-UPS	105
LESSONS LEARNED ... START-UPS (CONTINUED).....	105
LESSONS LEARNED ... START-UPS (CONTINUED).....	107
WHY IS THAT NECESSARY?	108
NANOMATERIALS TECHNOLOGY AND BUSINESS DEVELOPMENT IN GERMANY: PART I.....	109
GOVERNMENT ORGANIZATIONS.....	110
VDI'S ROLE.....	111
OTHER NETWORKS.....	111
UNIVERSITY OF KARLSRUHE	112

INDUSTRY NEWS	113
DUPONT LICENSES CNI'S PRODUCTION PROCESS	113
JOINT VENTURE AIMS TO COMMERCIALIZE NANOCARBON	114
HOSOKAWA MICRON AND NANOPRODUCTS TEAM UP	115
ALTAIR TO PENETRATE JAPANESE MARKET	116
BOS ACQUIRES LICENSE FROM RESEARCH FRONTIERS.....	116
ALTAIR AND NTERA TEAM UP ON BATTERY EFFORT.....	117
MIT WINS \$50 MILLION FOR SOLDIER NANOTECH INSTITUTE	118
INFRAMAT ESTABLISHES SHANGHAI JV FOR COATING PRODUCTION	119
CABOT MICROELECTRONICS REPORTS REVENUE DROP.....	120
NANO COMPANIES MAKE RED HERRING 100	121
NANO COMPANIES MAKE RED HERRING 100 (CONTINUED).....	122
ALTAIR'S 1Q REVENUES EXCEED ENTIRE FY01.....	123
NANOPHASE GETS FOOT INTO CMP BIZ AS RODEL SUPPLIER	124
MOTOROLA, DA NANOMATERIALS TEAM TO MARKET SLURRY.....	125
NANOCOR AND MITSUBISHI GAS CHEMICAL FORGE ALLIANCE ...	126
NANOMATERIALS MARKET GROWTH TO BE EXPLORED AT MEETING	127
<i>TABLE 1 VALUE OF NANOPARTICLES CONSUMED THROUGH 2005 (\$ MILLIONS).....</i>	128
CABOT MICROELECTRONICS REPORTS REVENUE RISE.....	129
NANOPHASE SEES 85% REVENUE RISE OVER 2001	129
NANOPHASE SEES REVENUE, MARGIN IMPROVEMENTS	130
NEWS BRIEFS	131
NANOPIERCE SIGNS LETTER OF INTENT	131
ROHM AND HAAS UPDATES OUTLOOK.....	131
OM GROUP ACQUIRES RHODIA DIVISION.....	131
SPD PLANS TO OFFER BOTH FILM AND GLASS	132
PRAXAIR SEMICONDUCTOR MATERIALS EXPANDS WEB PRESENCE.....	132
NANOPHASE EMPLOYEES BACK TO WORK.....	132
NANOCARRIER HOOKS UP WITH GLAXOSMITHKLINE.....	132
SUMITOMO AND CARBON NANOTECHNOLOGIES, INC. (CNI) JOIN FORCES.....	133
U.K. NANOTECH CENTER LAUNCHED	133
SUBSIDIARY TO UNDERTAKE HIGH-VOLUME PRODUCTION	133
COURT ORDERS FINAL APPROVAL OF SETTLEMENT	134
CABOT MICROELECTRONICS SETTLES PATENT DISPUTE	134
NANOENERGY CORP. CHANGES NAME	135
NANOCOR LAUNCHES CHINA PROMOTION	135
MOLECULAR NANOSYSTEMS RECEIVES \$2 MILLION	135
NANOPHASE RECEIVES ORDER FOR OPTICAL POLISHING APPLICATION	135

GE INVESTS \$100 MILLION IN RESEARCH CENTER.....	136
NEO PHOTONICS MAKES \$25M IN FUNDING ROUND.....	136
PRICING FOR SPINEL POWDERS ANNOUNCED	136
NANOPHASE FORECASTS 2002 REVENUE.....	137
VC FIRM CHANGES SYMBOL TO SHOW NANO FOCUS.....	137
ALTAIR'S 2001 NANOMATERIAL SALES TOTAL \$43K	137
NANOINK SECURES \$3 MILLION IN FINANCING.....	138
HARRIS & HARRIS GROUP INVESTS IN NANOOPTO	138
FRAUNHOFER CENTER ACQUIRES REACTOR.....	138
AMENDED CLASS ACTION COMPLAINT FILED	138
NANOPIERCE CLOSES \$2M FINANCING	139
NANOMAGNETICS OPENS NEW LABS	139
C SIXTY APPOINTS CEO	139
NANOPHASE REAPS \$6.85M INVESTMENT.....	140
HARRIS & HARRIS INVESTS IN NANOTECHNOLOGIES.....	140
ALTAIR COMPLETES \$1M EQUITY PLACEMENT.....	140
LUCENT SPINS-OFF AGERE.....	140
CLARKSON RECEIVES \$30M FROM COULTER FOUNDATION	141
TEXAS UNIVERSITIES FORM NANOTECH ALLIANCE.....	141
LEGISLATION PROVIDES FUNDING FOR NANOSYSTEMS INSTITUTE.....	141
NANOPHASE UPDATES FORECAST.....	141
REPORT PROVIDES DIRECTIVES FOR NNI.....	142
OXONICA NETS \$6M IN FUNDING ROUND	142
ROHM & HAAS EXPECTS REVENUE RISE IN 2Q.....	143
NIST ANNOUNCES ATP 2002 COMPETITION	143
NANOCOR AND GITTO GLOBAL EXPAND JOINT PROGRAM....	143
NANOPRODUCTS FORGES ALLIANCE WITH PLASTICS PRODUCER	143
BAXTER, NU TEAM UP TO ADVANCE NANOSCIENCE IN MEDICINE.....	144
DEGUSSA TO BE TAKEN OVER BY RAG	144
NANOMAT SPINS OFF COMPANY	144
NANOSCIENCE CENTER PLANNED FOR BROOKHAVEN.....	145
U.K. TAKES STEPS TO INCREASE COMPETITIVENESS	145
SI DIAMOND CONSIDERS SALE OF NANOTECH DIVISION	145
NANOSPHERE AND ASIAN BIOTECH FIRM FORM ALLIANCE.....	145
ALUMINA NANOFIBERS MAKE R&D 100	146
FERX COMPLETES \$15M EQUITY PLACEMENT.....	146
NANOTECH CENTER GETS \$75M DOE GO-AHEAD.....	146
VEECO ESTABLISHES CHINA FACILITY	147
PURDUE TO HEAD NANOELECTRONICS INSTITUTE.....	147

ALTAIR NAME CHANGE TAKES EFFECT	147
HARRIS & HARRIS DECIDES AGAINST NAME CHANGE	148
ORTHOVITA AND BIOMIMETIC SIGN AGREEMENT	148
NANOMIX SECURES \$9M IN FUNDING.....	148
NANOSPHERE WINS \$1.5M IN NIH GRANTS.....	148
NANOLAYERS CLOSES SEED FINANCE ROUND	149
UTEXAS CREATES NANOMANUFACTURING PROGRAM	149
NANOSYS SIGNS LICENSE AGREEMENT.....	149
ALTAIR MOVES TO NASDAQ SMALLCAP.....	150
ADVANCED MAGNETICS ENTERS CLINICAL TRIALS	150
NANO GATE TEAMS UP WITH GERMAN SKI WAX PRODUCER	150
MOTOROLA NANOTUBE TECHNOLOGY LICENSED BY CETEK	151
NANO-TIO ₂ THERMAL SPRAY MATERIAL TO COAT BALL VALVES	151
NANOPHASE WILL CONTEST CLASS ACTION COMPLAINT.....	151
OM GROUP HALTS SUBMICRON WC PRODUCTION.....	152
NANOTECH BILL INTRODUCED IN U.S. HOUSE	152
NANOSYS COLLABORATES ON SOLAR CELLS FOR ASIA	152
NANOPRODUCTS ADDS \$1 MILLION IN EQUIPMENT TO FACILITY.....	153
ALLEGED PRICE FIXING INVESTIGATED.....	153
MIT'S SOLDIER INSTITUTE HOLDS INDUSTRY DAY	154
ALTAIR LAUNCHES ANIMAL TESTS OF PHARMACEUTICAL	154
DEPOSITION SYSTEM INTRODUCED.....	154
DOW OFFERS DRUG PARTICLE ENGINEERING	155
RECENT PATENTS	155
FUNCTIONALIZED NANOCRYSTALS HELP VISUALIZE LIVE TISSUE	155
VIBRATIONS INDUCE ORDERING	155
METHOD TO PURIFY NANOTUBES PROTECTED.....	156
IMMUNOSENSOR ASSEMBLED FROM COLLOIDAL PARTICLES	156
SILBOND STEPS INTO CMP ARENA.....	157
JAPANESE COMPANY PRODUCES NANOCRYSTALLINE BN....	157
LUMINESCENT NANOCRYSTALS BOAST 30+% QUANTUM YIELD.....	157
ZIRCONIA ADDITION IMPROVES PHOTOCATALYTIC FILM FORMULATION.....	158
JAPANESE FIRMS TEAM UP ON SLURRY DEVELOPMENT	158
LARGE PARTICLES EXTRACTED FROM NANOPARTICLE STREAMS	158

NANOTUBES SERVE AS PARTICLE TEMPLATES.....	159
NANOPHASE DEVELOPS CORE-SHELL TECHNOLOGY	159
CATALYST ISLANDS LEAD TO NANOTUBES	159
ORTHOVITA PATENT COVERS 12 NEW CLAIMS	160
AUTOCLAVING SLURRIES INCREASES ABRASIVENESS.....	160
CAPO4 PARTICLES HAVE THERAPEUTIC USES	160
AGGLOMERATES ELIMINATED FROM POLISHING SLURRY	161
NANOSILICA FILLS DENTAL NANOCOMPOSITE.....	161
CMP SLURRIES STABILIZED AGAINST PH DRIFT.....	161
BUBBLE COLLAPSE YIELDS NANOPARTICLES.....	161
SiO ₂ FILLER IMPROVES POLYMER STRENGTH	162
FOAMS MADE FROM OXIDE NANOPARTICLES	162
NANOGRAM PROTECTS LASER PYROLYSIS.....	163
SOLID ELECTROLYTE FABRICATED FROM NANOCRYSTALS.....	163
E-BEAM IRRADIATION YIELDS SI NANOCRYSTAL ARRAYS ...	163
NANOPHASE MOVES TO PROTECT SURFACE TECHNOLOGY.....	164
NANOPARTICLES PLAY ROLE IN ANTIFOULING COATING ...	164
PROCESS YIELDS CUBIC NANOPHOSPHORS.....	164
NANOPHASE PROTECTS DISPERSION TECHNOLOGY.....	165
CERAMIC COMPOSITES REINFORCED WITH NANOTUBES.....	165
NANOPARTICLES IMPART OPTICAL STABILITY TO PLASTIC	165
SAMSUNG LI-BATTERY DESIGN USES NANOTUBES	165
BACTERIA RESPIRATION EXPLOITED TO PRODUCE NANOCRYSTALS.....	166
NANO-SI PROVIDES FREQUENCY DOUBLING, MIXING	166
GAP-FILLING DIELECTRIC BASED ON NANOPARTICLES	166
THERMAL SPRAY TECHNOLOGY YIELDS NANOCOATINGS....	167
NANOPARTICLES SELF-ASSEMBLED TO FORM SENSOR.....	167
METAL OXIDES CLEAN HYDROCARBON STREAMS	167
HYBRID FEDS RELY ON NANOTUBES	168
NANOSTRUCTURING IMPROVES COATING PROPERTIES	168
SONY DEVELOPS HIGHLY SENSITIVE SENSOR.....	168
PLASMA GENERATES CERAMIC NANOPARTICLES.....	169
LI BATTERY POWDERS FORMED BY LASER PYROLYSIS	169
RESEARCH NEWS	169
HIGH EFFICIENCY FROM PULSED WIRE DISCHARGE	169
BIOMIMETIC APPROACH OFFERS BENIGN SYNTHESIS ROUTE	170
MRI CONTRAST AGENT AIDS CANCER TREATMENT.....	170

U CHICAGO RESEARCHERS DEMONSTRATE	
HIERARCHICAL SELF-ASSEMBLY.....	170
DOPED NANOPARTICLES EVALUATED FOR SENSORS	171
LITHIUM STORAGE IN NANOTUBES INVESTIGATED.....	171
NANO TIN PRODUCED BY DIRECT NITRIDATION OF TiO ₂	172
ULTRASONICATION MINIMIZES AGGREGATE SIZE.....	172
CONTINUOUS NANOCOATINGS FORMED BY SOL-GEL.....	172
NANO-SMECTITE PRODUCED IN CHINA.....	173
NANO MoSi ₂ PRODUCED AND DENSIFIED	
SIMULTANEOUSLY.....	173
CONTINUOUS NANOCOATINGS FORMED BY SOL-GEL.....	173
CHOICE OF SUPPORT MATERIAL DEEMED CRITICAL	174
NANOTUBES DIVIDED INTO QUANTUM DOTS.....	174
RESEARCHERS OBTAIN ATOM-RESOLVED IMAGES OF	
CATALYSTS	174
COLLOIDAL STABILITY DEPENDS ON IONIC STRENGTH.....	175
MICROSCOPY ILLUMINATES DEFORMATION	
MECHANISMS.....	175
MECHANICAL ACTIVATION AFFECTS PHASE	175
BIOFUNCTIONALITY IMPARTED TO FULLERENES	176
SELENIDES PRODUCED AT ROOM T.....	176
FINE POWDERS IMPROVE CAPACITORS.....	176
NANOWIRE ARRAYS FORMED WITHOUT TEMPLATE.....	177
EMBEDDED Pd PARTICLES SHOW HIGHER H ₂	
ABSORPTION.....	177
CERIA NANOCRYSTALS MADE BY FLAME PROCESS	177
LASER PRODUCED FROM COLLOIDAL NANOCRYSTALS	178
ALTAIR COMPLETES SOFC DEMONSTRATION TESTS.....	178
CERAMIC PROCESS YIELDS PHOTONIC STRUCTURES.....	179
SIZE OF GOLD NANOCRYSTALS TIGHTLY CONTROLLED.....	179
BN NANOTUBES PRODUCED IN HIGH YIELDS	180
NEW APPROACH YIELDS SIZE CONTROL.....	180
NANOFILLER MOBILITY CONTROLS COMPOSITE	
PROPERTIES	180
FERX TEAMS UP WITH CANCER INSTITUTE	181
NANOPARTICLES ADDED TO SILVER PASTES	181
NANOPARTICLES COULD INACTIVATE ANTHRAX.....	181
SLOW COMBUSTION YIELDS SMALLER PARTICLES.....	182
BAZRO ₃ CHEMICAL SYNTHESIS METHOD ADVANCED	182
HIGH-QUALITY DEPOSITS FORMED FROM NANO-ZnO	182
CERIA-COATED SILICA ACHIEVES HIGHER POLISHING	
RATE	183
CAPO ₄ NANOPARTICLES INDUCE IMMUNITY	183
SOLID-STATE METHOD YIELDS LaCoO ₃ IN HIGH YIELDS.....	183

QUANTUM DOTS ENGINEERED FOR CANCER DETECTION....	184
POLYMER TEMPLATE YIELDS TINY MAGNETIC CRYSTALS.....	184
NI DISPERSED HOMOGENEOUSLY IN ALUMINA MATRIX.....	184
NANOWIRE ARRAY SHOWS TUNABLE MAGNETIC PROPERTIES	185
CONTRAST AGENT CAN ASSESS LYMPH NODES	185
BIOMOLECULES MEDIATE ASSEMBLY OF GOLD PARTICLES	185
PROJECTS FUNDED.....	186
\$970,000 AWARDED FOR NANO CATHODE MATERIAL PROJECT	186
CONTRACT SUPPORTS NEAR NET-SHAPE PROCESS DEVELOPMENT	186
SURROMED AWARDED CONTRACT FOR NIH STUDY.....	186
NANOCLAY MEMBRANES COMPARED TO NAFION.....	187
HIGH-RATE PARTICLE SORTING PROCESS ADVANCED	187
DENDRIMERS ALLOW DIRECT DNA DETECTION	187
NANOFIBER NETWORKS PRODUCED BY ELECTROSPINNING	188
AVEKA FORMS CATHODE FROM NANOPHASE V ₂ O ₅	188
\$1.8M GRANTS ACCELERATE UNIVERSITY'S NANOTECH RESEARCH.....	188
NANOPARTICLES IMPROVE PERMANENT MAGNETS	189
AP MATERIALS SEEKS TO INCREASE BATTERY CAPACITY....	189
EIC DEVELOPS MILITARY OPTICAL FILTERS	190
NANOCOMPOSITE DESIGNED FOR BIODEGRADABLE PLASTIC	190
SELF-MONITORING COMPOSITES BASED ON NANOTUBES	190
NANOFILTER DESIGNED TO PURIFY WATER IN SPACE.....	191
COATED ALUMINUM DESIGNED FOR PROPELLANTS.....	191
NANOSYS DEVELOPS NANOWIRES FOR SENSING.....	191
NEI, FRAUNHOFER DEVELOP POLYMER NANOCOMPOSITES	192
NANO TI TO REPLACE AL IN ARMORED VEHICLES.....	192
SIC NANOPARTICLES FORM BASIS FOR COOLANT.....	192
NEW BOOKS	193
PUBLICATION REVIEWS NANOMATERIAL TECHNOLOGY	193
CONCISE EDITION OF HANDBOOK RELEASED.....	193
NEW VOLUME DESIGNED AS COURSE BOOK AND REFERENCE	193
VOLUME DELVES INTO POLYMER NANOCOMPOSITES.....	194
NEW BOOK OFFERS ADVICE FOR NANOTECH INVESTING.....	194

NANOMAGNETIC MATERIALS COVERED BY REVIEW	
VOLUME.....	194
PEOPLE	195
ALTAIR CREATES NEW EXECUTIVE POSITION.....	195
FOUNDERS' RESEARCH RECOGNIZED BY SCIENCE.....	195
START-UP COMPANY ADDS DIRECTOR TO BOARD	195
BUSINESS DEVELOPMENT TEAM EXPANDED	196
RESEARCH FRONTIERS PROMOTES LAPOINTE.....	196
NEW SALES EXEC APPOINTED AT ORTHOVITA.....	196
NANOSYS ADDS DIRECTOR	196
COMPANY FOUNDER RECEIVES AWARD	196
VP ASSUMES PRESIDENT POSITION AT ALTAIR	197
NUCRYST APPOINTS CMO.....	197
NSERC NAMES RESEARCH DIRECTOR.....	197
ALTAIR APPOINTS MIT PROF TO ADVISORY BOARD	198
CABOT ELECTS FORMER AMOCO EXEC TO BOARD	198
GE SCIENTIST JOINS TAL'S BOARD	198
PRESIDENT APPOINTED AT NEI.....	199
RESEARCH FRONTIERS EXPANDS BOARD.....	199
BATTERY EXPERT JOINS ALTAIR'S ADVISORY BOARD	199
CABOT MICROELECTRONICS LOSES CFO.....	199
ORTHOVITA'S BOARD UNDERGOES CHANGES	199
FERRO CFO RESIGNS	200
ROHM AND HAAS VP TAKES THE REINS AT RODEL	200
CANADIAN NANOTECH INSTITUTE APPOINTS STAFF.....	200
NANOBUSINESS ALLIANCE EXPANDS BOARD.....	200
FINANCIAL RESULTS.....	201
ADVANCED MAGNETICS' SALES DROP SLIGHTLY.....	201
CABOT EARNINGS UP BUT VOLUMES DOWN.....	201
CABOT MICROELECTRONICS' REVENUE FLAT FOR Q1	201
FERRO ACHIEVES RECORD SALES	202
NANOPHASE SEES SMALL REVENUE INCREASE.....	202
WESTAIM POSTS LOSS.....	202
ADVANCED MAGNETICS REPORTS PROFIT	203
CABOT EARNINGS DOWN.....	203
NANOPHASE GENERATES \$1.4 M IN REVENUE	203
ORTHOVITA REPORTS SALES INCREASE	204
WESTAIM POSTS LOSS.....	204
ADVANCED MAGNETICS POSTS LOSS.....	204
CABOT EARNINGS DOWN BY 50%.....	205
PRODUCT REVENUE REACHES HIGH AT NANOPHASE	205
CABOT MICROELECTRONICS REPORTS REVENUE RISE.....	205
ORTHOVITA SEES 46% INCREASE IN SALES.....	206
CABOT REPORTS VOLUME IMPROVEMENTS	206

SLURRIES FOR CU POLISHING BOOST SALES	206
FERRO SEES REVENUE RISE.....	207
FIBER OPTIC DOWNTURN HURTS MOYCO.....	207
ORTHOVITA'S SALES GROW FOR 8TH CONSECUTIVE QUARTER.....	207
ADVANCED MAGNETICS POSTS LOSS.....	208
NANOPHASE LOWERS REVENUE EXPECTATIONS.....	208
MANUFACTURING NEWS.....	209
MITSUI PLANS WORLD'S LARGEST NANOTUBE PLANT	209
SDK READY FOR MASS PRODUCTION OF VAPOR-GROWN CARBON NANOFIBERS	209
TECHNIQUE TRIMS CARBON FIBER COSTS	210
JOINT VENTURE LAUNCHED TO MANUFACTURE NANOCARBON.....	211
TECHNIQUE TRIMS CARBON FIBER COSTS	212
JOINT VENTURE LAUNCHED TO MANUFACTURE NANOCARBON.....	213
MACHINING CHIPS TO NANOCRYSTALLINE PARTS.....	214
MACHINING CHIPS TO NANOCRYSTALLINE PARTS (CONTINUED).....	215
MACHINING CHIPS TO NANOCRYSTALLINE PARTS (CONTINUED).....	216
MARKET ANALYSIS.....	217
MARKET FOR SOL-GEL PRODUCTS TO REACH \$936M BY 2006.....	217
<i>TABLE 2 U.S. AND WORLD MARKETS FOR SOL-GEL PRODUCTS, THROUGH 2006</i> (\$ MILLIONS).....	218
POLYMER NANOCOMPOSITES.....	219
SELF-ORGANIZING NANOMATERIALS IMPROVE SKI AND SNOWBOARD WAX.....	219
ENCAPSULATED SILICA ENABLES SCRATCH-PROOF COATINGS	220
NANOTHIN CLAY PARTICLES REINFORCE AUTO WINDOWS	221
RTP INTRODUCES NANOCOMPOSITE FOR EXTRUDED FILM OR SHEET	222
REINFORCEMENT WITH NANOTUBES MAKES POLYMERS CONDUCTIVE	223
AUTO CARE PRODUCTS WILL EXPLOIT NANO GATE'S COATINGS	224
NANOCOMPOSITES USING STANDARD EQUIPMENT.....	224
X-RAY ABSORBING WINDOWS MOLDED FROM NANOCOMPOSITES	225
X-RAY ABSORBING ... NANOCOMPOSITES (CONTINUED).....	226

PRODUCT NEWS	227
SDK INTRODUCES TiO ₂ AND ZnO FOR COSMETICS.....	227
NANOPHASE ADDS SMALLER ZnO TO PRODUCT LINE	227
SURFACE-ENGINEERED NANO ALUMINA READILY DISPERSED	228
SURFACE-ENGINEERED ... DISPERSED (CONTINUED)	229
DEGUSSA LAUNCHES SILICA FOR PHARMA APPLICATIONS	230
SELF-ASSEMBLY TECHNOLOGY	231
PROTEIN ACTS AS TEMPLATE FOR NANOPARTICLE ORGANIZATION.....	231
ELECTRIC FIELD ASSEMBLES 3-D PARTICLE STRUCTURES.....	232
ELECTRIC FIELD ASSEMBLES 3-D PARTICLE STRUCTURES (CONTINUED)	233
TECHNOLOGY INSIGHT	234
ALTERNATIVE ENERGY APPLICATIONS FOR NANOMATERIALS	234
THE PROCESS	234
SOLID OXIDE FUEL CELLS.....	235
RECHARGEABLE BATTERIES	236
AEROSOL SILICON NANOPARTICLE NONVOLATILE FLOATING GATE MEMORY DEVICES PART I: FABRICATION	237
ABSTRACT.....	237
INTRODUCTION.....	237
EXPERIMENTAL SET-UP	238
Gas Delivery System	238
Pyrolysis and Oxidation Furnaces.....	239
Deposition Chamber	239
TXRF/SIMS.....	240
AEROSOL SILICON NANOPARTICLE NONVOLATILE FLOATING GATE MEMORY DEVICES PART II: PERFORMANCE.....	240
CONTAMINATION LEVELS.....	241
NANOPARTICLE CHARACTERIZATION	241
DEVICE PERFORMANCE.....	241
CONCLUSIONS	242
QUANTUM DOT NANOPARTICLES AND THEIR BIOLOGICAL APPLICATIONS: PART I.....	243
HISTORICAL BACKGROUND	243
WHAT ARE QUANTUM DOTS?.....	244
EXTRAORDINARY OPTICAL PROPERTIES	245
Multiple Colors = Multiplexing.....	245
Narrow Emission = Very Sharp Colors	245
Photostability.....	245
Brightness	245
Broad Excitation.....	246
Stokes Shift.....	246

Consistent Surface Chemistry	246
QUANTUM DOT NANOPARTICLES AND THEIR BIOLOGICAL APPLICATIONS: PART II	246
SYNTHESIS	247
Core	247
Shell	247
Novel Surface Coatings	247
DETECTION	248
QDOT BAR CODES	248
Qbead Technology.....	249
PHASE TRANSFER OF NANOPARTICLES FROM ORGANIC TO AQUEOUS MEDIA PART I: SPONTANEOUS TRANSFER	249
ABSTRACT.....	250
INTRODUCTION.....	250
METHOD 1: SPONTANEOUS TRANSFER.....	250
PHASE TRANSFER OF NANOPARTICLES FROM ORGANIC TO AQUEOUS MEDIA, PART II: TRANSFER VIA COVALENT LIGAND ATTACHMENT	251
GENERAL EXAMPLE.....	252
General Example (Continued)	253
SUMMARY	254
FABRICATION OF 2D- AND 3D-NANOSTRUCTURES MADE OF GOLD NANOPARTICLES AND THE ELECTRICAL PROPERTIES....	254
SELF-ORGANIZATION.....	255
FABRICATION USING LB METHOD	256
DNA-ASSISTED FABRICATION	256
CONCLUSION	257
THE SINTERING PROCESS OF NANOSIZE SILVER POWDERS	257
EXPERIMENTAL PROCEDURE.....	258
<i>TABLE 3 SILVER POWDERS USED IN EXPERIMENTS.....</i>	<i>258</i>
Electrical Resistance Measurements.....	259
RESULTS AND DISCUSSION	259
The Organic Coating Effect.....	259
Electrical Properties of Silver Powders	259
<i>TABLE 4 ELECTRICAL PROPERTIES OF SILVER POWDERS.....</i>	<i>260</i>
Sintering Mechanisms.....	260
<i>TABLE 5 ACTIVATION ENERGY CALCULATED FROM EXPERIMENTAL ELECTRICAL CONDUCTIVITY DATA.....</i>	<i>261</i>
CONCLUSION	261
TECHNOLOGY TRANSFER	262
QINETIQ LICENSES PLASMA TECHNOLOGY	262
ANI AND UMASS SIGN LICENSING OPTION	263
WASHINGTON NEWS	264

NEWT GINGRICH JOINS NANO TRADE ASSOCIATION	264
SENATORS INTRODUCE BILL TO PROMOTE NANOTECH R&D	264
U.S. FUNDS BIOWARFARE AGENT DETECTION.....	265
ATP GRANT SUPPORTS BIOTECH COLLABORATION.....	266
ATP GRANT SUPPORTS BIOTECH COLLABORATION (CONTINUED).....	267
NANOMATERIALS KEY TO FOUR NEW ATP PROJECTS.....	268
GE TO ADVANCE NANOENGINEERED INTERFACES	268
TEMPLATE SYNTHESIS OF NANORODS INITIATED.....	269
NANOCOMPOSITE INSULATION DESIGNED FOR STRENGTH	269
eSPIN TECHNOLOGIES TO MANUFACTURE NANOFIBER MATS.....	270
REGULATION IMPORTANT FOR NANOTECH GROWTH.....	271