

## BIRCK NANOTECHNOLOGY SCIFRES CLEANROOM INTERNAL RATES

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>SERVICE CHARGES:</b>			
Cleanroom Daily Access Fee	\$13k Annual & 8 Days Monthly	Per Day	\$ 40.00
Training Time	\$13k Annual	Per Hour	\$ 47.00
Engineering Staff Time	\$13k Annual	Per Hour	\$ 53.00
Process Scientist Staff Time	\$13k Annual	Per Hour	\$ 75.00
<b>EQUIPMENT: Metallization</b>			
Airco E-Beam Evaporator	\$13k Annual	Per 4 Hour Use	\$ 100.00
Cha E-Beam Evaporator	\$13k Annual	Per 4 Hour Use	\$ 100.00
Leybold E-Beam Evaporator	\$13k Annual	Per 4 Hour Use	\$ 100.00
Perkin Elmer 2400 Sputterer	\$13k Annual	Per 4 Hour Use	\$ 100.00
Varian E-Beam Evaporator	\$13k Annual	Per 4 Hour Use	\$ 100.00
PVD Electron Beam Evaporator #1	\$13k Annual	Per 2 Hour Use	\$ 100.00
PVD Electron Beam Evaporator #2	\$13k Annual	Per 4 Hour Use	\$ 100.00
Veeco Thermal Evaporator	\$13k Annual	Per 4 Hour Use	\$ 100.00
Kurt J Lesker E-Beam	\$13k Annual	Per 3 Hour Use	\$ 100.00
PVD Sputtering System - Metals/Dielectrics	\$13k Annual	Per 2 Hour Use	\$ 60.00
PVD Sputtering System - Magnets	\$13k Annual	Per 2 Hour Use	\$ 60.00
Vistec E-Beam (VB6)	No	Per Hour	\$ 147.00
<b>EQUIPMENT: Testing</b>			
Veeco Dimension AFM	\$13k Annual	Per 1 Hour Use	\$ 13.00
Dimension 3100 AFM	\$13k Annual	Per 1 Hour Use	\$ 30.00
Alpha-Step IQ	\$13k Annual	Per Half-Hour Use	\$ 4.00
Filmetrics	\$13k Annual	Per Half-Hour Use	\$ 3.00
Olympus BX-60 Microscope	\$13k Annual	Per Half-Hour Use	\$ 3.00
Ellipsometer	\$13k Annual	Per Half-Hour Use	\$ 6.00
JEOL JCM-5000 Table Top SEM	\$13k Annual	Per Half-Hour Use	\$ 15.00
MMR Probe Station #2	\$13k Annual	Per 2 Hour Use	\$ 51.00
<b>EQUIPMENT: Furnaces</b>			
Blue M Oven	\$13k Annual	Per 1 Hour Use	\$ 7.00
Ammonia (NH3) Anneal	\$13k Annual	Per 1 Hour Use	\$ 18.00
Nitric Oxide Anneal	\$13k Annual	Per 1 Hour Use	\$ 9.00
Silicon Carbide Anneal	\$13k Annual	Per 1 Hour Use	\$ 9.00
Pyrogenic Oxydation	\$13k Annual	Per 4 Hour Use	\$ 69.00
RTA Heatpulse 610	\$13k Annual	Per 1 Hour Use	\$ 10.00
RTA MiniPulse	\$13k Annual	Per 1 Hour Use	\$ 10.00
ProTemp Tube_01	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_02	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_03	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_04	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_05	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_06	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_07	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_08	\$13k Annual	Per 1 Hour Use	\$ 28.00
ProTemp Tube_09	\$13k Annual	Per 1 Hour Use	\$ 28.00
<b>EQUIPMENT: Plasma (Etch)</b>			
Branson	\$13k Annual	Per 1 Hour Use	\$ 10.00
Axic CVD	\$13k Annual	Per 2 Hour Use	\$ 42.00
Plasma Tech RIE	\$13k Annual	Per Half-Hour Use	\$ 16.00
ASE Etcher	\$13k Annual	Per 1 Hour Use	\$ 48.00

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>EQUIPMENT: Photolithography</b>			
MJB-1 Wafer Aligner	\$13k Annual	Per Half-Hour Use	\$ 12.00
MJB-2 Wafer Aligner	\$13k Annual	Per Half-Hour Use	\$ 12.00
Suss MA-6 Mask Aligner	\$13k Annual	Per Half-Hour Use	\$ 12.00
Spinner #1	\$13k Annual	Per Half-Hour Use	\$ 3.00
Spinner #2	\$13k Annual	Per Half-Hour Use	\$ 3.00
Nanonex NX-2000 Nanoimprinter	\$13k Annual	Per 1 Hour Use	\$ 21.00
Suss SB6e Substrate Bonder	\$13k Annual	Per 1 Hour Use	\$ 50.00
MA-24 Mask Aligner	\$13k Annual	Per Half-Hour Use	\$ 12.00
<b>EQUIPMENT: Electrical Characterization</b>			
MMIIProbe 3	\$13k Annual	Per 2 Hour Use	\$ 33.00
MMIIProbe 2	\$13k Annual	Per 2 Hour Use	\$ 33.00
MMIProbe 1	\$13k Annual	Per 2 Hour Use	\$ 33.00
Jandel 4-point probe system	\$13k Annual	Per Half-Hour Use	\$ 2.00
<b>EQUIPMENT: Photomasks</b>			
PG	No	Per Mask	\$ 273.00
IR	No	Per Mask	\$ 210.00
RET	No	Per Mask	\$ 58.00
Transparency	No	Per Mask	\$ 21.00
<b>EQUIPMENT: Miscellaneous</b>			
Xef Etcher	\$13k Annual	Per 1 Hour Use	\$ 18.00
Parylene CVD	\$13k Annual	Per 4 Hour Use	\$ 48.00
Fiji200 ALD	\$13k Annual	Per Use	\$ 55.00
DiscoDad Dicing Saw	\$13k Annual	Per 1 Hour Use	\$ 23.00
Critical Point Driver (CPD)	\$13k Annual	Per 1 Hour Use	\$ 11.00
CMP	\$13k Annual	Per 1 Hour Use	\$ 18.00
Disco Dad Dicing Saw #2	\$13k Annual	Per 1 Hour Use	\$ 23.00
Easy Tube 3000 ALD	\$13k Annual	Per 2 Hour Use	\$ 40.00
Jipelec RTA	\$13k Annual	Per 1 Hour Use	\$ 15.00
Heidleburg	\$13k Annual	Per 2 Hour Use	\$ 138.00
Bruker Optical Profileometer	\$13k Annual	Per Half-Hour Use	\$ 15.00
<b>EQUIPMENT: Bonders &amp; STS</b>			
STS_AOE	\$13k Annual	Per 1 Hour Use	\$ 48.00
STS_ASE	\$13k Annual	Per 1 Hour Use	\$ 48.00
Panasonic	\$13k Annual	Per Hour	\$ 90.00
Stress Machine	\$13k Annual	Per Half-Hour Use	\$ 36.00
West Bond	\$13k Annual	Per 1 Hour Use	\$ 35.00
Wire Bonder #1 (KNS)	\$13k Annual	Per 1 Hour Use	\$ 16.00
Wire Bonder #2 (KNS)	\$13k Annual	Per 1 Hour Use	\$ 16.00
JFP Wire Bonder	\$13k Annual	Per 1 Hour Use	\$ 16.00
KNS4526 Ribbon Bonder	\$13k Annual	Per 1 Hour Use	\$ 16.00
Small Wire Bonding Package	\$13k Annual	Per Package	\$ 10.00
Large Wire Bonding Package	\$13k Annual	Per Package	\$ 25.00
<b>METALS:</b>			
Gold	No	Per Nanometer	\$ 0.71
Platinum	No	Per Nanometer	\$ 1.58
Palladium	No	Per Nanometer	\$ 0.13
Scandium	No	Per Nanometer	\$ 3.10
All Other Metals	No	Per Nanometer	\$ 0.10

\*\$13k Annual cap refers to the \$13,000 per user, per account CAP on a fiscal year basis

\*\*8 Days Monthly cap refers to a max of 8 days paid per month in access fees per user, per account

# BIRCK NANOTECHNOLOGY OUTSIDE LABS INTERNAL RATES

## LAB ACCESS (CHARGE BASED ON HIGHEST LEVEL ENTERED)

MACHINE/PROCESS	CAP?	UNIT	RATE
DRY LAB ACCESS CHARGE - LEVEL ONE	8 days Monthly	Per Day	\$4.00
SOLVENT LAB ACCESS CHARGE - LEVEL TWO	8 days Monthly	Per Day	\$13.00
ACID LAB ACCESS CHARGE - LEVEL THREE	8 days Monthly	Per Day	\$19.00

\*Cap is per user, per project per fiscal year

## BIOLOGY LABS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
BioLabs Access	8 days Monthly	Per Day	\$22.00
Zetasizer	No	Per Hour	\$4.00
Olympus FV1000 Confocal Microscope	No	Per Hour	\$25.00
Cell Culture BioHood Surcharge	No	Per Month	\$25.00
Special Projects Hourly Staff Rate	No	Per Hour	\$55.00

## ELECTRON MICROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Hitachi S-4800 Field Emission SEM (s-4800)	No	Per Hour	\$27.00
Titan 80-300 kV Environmental Electron Microscope (titan_80_300)	No	Per Hour	\$75.00
FEI Nova 200 NanoLab DualBeam TM-SEM/FIB (nova_200)	No	Per Hour	\$54.00
SPI Sputter Coater (SPI_sputter_coater)	No	Per Run	\$14.00
Electron Microscopy Staff Rate	No	Per Hour	\$36.00

## ATOMIC FORCE MICROSCOPY RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Nanotech AFM 1	\$5k Annual	Per Hour	\$25.00
Nanotech AFM 2	\$5k Annual	Per Hour	\$25.00
Agilent 5500	\$5k Annual	Per Hour	\$25.00
Asylum MFP3D Bio AFM	\$10k Annual	Per Hour	\$44.00
Asylum Cypher	\$10k Annual	Per Hour	\$44.00

\*Cap is per user, per project per fiscal year

## EPITAXY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Electrodeposition	No	N/C	N/A
XRD (xrd) - normal scan	No	Per Hour	\$38.00
XRD (xrd) - rsm scan	No	Per Run	\$228.00
OMVPE Aixtron (aixtron)	No	Per Run	\$175.00
Nitride Sputter System (nitride_sputtering)	No	Per Run	\$85.00
Oxide PLD System (pld)	No	Per Run	\$85.00
Epitaxy Staff Rate	No	Per Hour	\$53.00

## OPTICS AND SPECTROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Spectrophotometer Lambda	No	Per Hour	\$17.00
Micro-sample Spectrometer	No	Per Hour	\$17.00
Raman Spectrometer T64000	No	Per Hour	\$27.00
NSOM/Luminescence Mapping	No	Per Run	\$33.00
V-VASE Spectroscopic Ellipsometer	No	Per Hour	\$8.00
Optics Staff Rate	No	Per Hour	\$66.00

<b>RAITH E-BEAM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Raith E-Line E-beam (raith)	No	Per Hour	\$29.00
Raith E-Beam Staff Rate	No	Per Hour	\$48.00
<b>MPCVD EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
MPCVD (MPCVD)	No	Per Use	\$51.00
MPCVD Staff Rate	No	Per Hour	\$53.00
<b>SURFACE ANALYSIS AND SPM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Kratos XPS Analysis Time (xps - staff)	No	Per Hour	\$70.00
Kratos XPS Instrument Time (xps)	No	Per Hour	\$43.00
Glovebox	No	Per Hour	\$25.00
Omicron (omicron)	No	Per Run	\$50.00
<b>LASER DOPPLER VIBROMETRY EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Micro System Analyzer (polytec_laser_vibrometer)	\$2k Annual	Per Hour	\$6.00
Vaccum Chamber (Suss_PLV50_ProbeStation)	\$2k Annual	Per Hour	\$13.00
LDV Staff Rate	No	Per Hour	\$36.00
*Cap is per user, per project per fiscal year			
<b>FEMTOSECOND LASER &amp; RAMAN SPECTROSCOPY RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Femtosecond Laser	No	Per Hour	\$30.00
Raman Spectrometer	No	Per Hour	\$27.00
Training/Staff Time	No	Per Hour	\$37.00
<b>THERMOELECTRIC CHARACTERIZATION RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Z-Meter (z_meter)	No	Per Hour	\$10.00
Bulk (TE_bulk)	No	Per Hour	\$10.00
Thin Film (TE_ThinFilm)	No	Per Hour	\$10.00
Training/Staff Time	No	Per Hour	\$31.00

Rates current as of July 1, 2013

For more information or questions, please contact:

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## BIRCK NANOTECHNOLOGY SCIFRES CLEANROOM NON-PROFIT RATES

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>SERVICE CHARGES:</b>			
Cleanroom Daily Access Fee	8 Days Monthly	Per Day	\$ 70.00
Training Time	No	Per Hour	\$ 98.00
Engineering Staff Time	No	Per Hour	\$ 125.00
Process Scientist Staff Time	No	Per Hour	\$ 131.00
<b>EQUIPMENT: Metallization</b>			
Airco E-Beam Evaporator	No	Per 4 Hour Use	\$ 313.00
Cha E-Beam Evaporator	No	Per 4 Hour Use	\$ 313.00
Leybold E-Beam Evaporator	No	Per 4 Hour Use	\$ 313.00
Perkin Elmer 2400 Sputterer	No	Per 4 Hour Use	\$ 313.00
Varian E-Beam Evaporator	No	Per 4 Hour Use	\$ 313.00
PVD Electron Beam Evaporator #1	No	Per 2 Hour Use	\$ 313.00
PVD Electron Beam Evaporator #2	No	Per 4 Hour Use	\$ 313.00
Veeco Thermal Evaporator	No	Per 4 Hour Use	\$ 313.00
Kurt J Lesker E-Beam	No	Per 3 Hour Use	\$ 313.00
PVD Sputtering System - Metals/Dielectrics	No	Per 2 Hour Use	\$ 187.00
PVD Sputtering System - Magnets	No	Per 2 Hour Use	\$ 187.00
Vistec E-Beam (VB6)	No	Per Hour	\$ 450.00
<b>EQUIPMENT: Testing</b>			
Veeco Dimension AFM	No	Per 1 Hour Use	\$ 42.00
Dimension 3100 AFM	No	Per 1 Hour Use	\$ 46.00
Alpha-Step IQ	No	Per Half-Hour Use	\$ 14.00
Filmetrics	No	Per Half-Hour Use	\$ 27.00
Olympus BX-60 Microscope	No	Per Half-Hour Use	\$ 11.00
Ellipsometer	No	Per Half-Hour Use	\$ 21.00
JEOL JCM-5000 Table Top SEM	No	Per Half-Hour Use	\$ 47.00
MMR Probe Station #2	No	Per 2 Hour Use	\$ 159.00
<b>EQUIPMENT: Furnaces</b>			
Blue M Oven	No	Per 1 Hour Use	\$ 133.00
Ammonia (NH3) Anneal	No	Per 1 Hour Use	\$ 44.00
Nitric Oxide Anneal	No	Per 1 Hour Use	\$ 30.00
Silicon Carbide Anneal	No	Per 1 Hour Use	\$ 30.00
Pyrogenic Oxydation	No	Per 4 Hour Use	\$ 215.00
RTA Heatpulse 610	No	Per 1 Hour Use	\$ 33.00
RTA MiniPulse	No	Per 1 Hour Use	\$ 33.00
ProTemp Tube_01	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_02	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_03	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_04	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_05	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_06	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_07	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_08	No	Per 1 Hour Use	\$ 91.00
ProTemp Tube_09	No	Per 1 Hour Use	\$ 91.00
<b>EQUIPMENT: Plasma (Etch)</b>			
Branson	No	Per 1 Hour Use	\$ 24.00
Axic CVD	No	Per 2 Hour Use	\$ 131.00
Plasma Tech RIE	No	Per Half-Hour Use	\$ 36.00
ASE Etcher	No	Per 1 Hour Use	\$ 93.00

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>EQUIPMENT: Photolithography</b>			
MJB-1 Wafer Aligner	No	Per Half-Hour Use	\$ 22.00
MJB-2 Wafer Aligner	No	Per Half-Hour Use	\$ 22.00
Suss MA-6 Mask Aligner	No	Per Half-Hour Use	\$ 24.00
Spinner #1	No	Per Half-Hour Use	\$ 11.00
Spinner #2	No	Per Half-Hour Use	\$ 11.00
Nanonex NX-2000 Nanoimprinter	No	Per 1 Hour Use	\$ 67.00
Suss SB6e Substrate Bonder	No	Per 1 Hour Use	\$ 84.00
MA-24 Mask Aligner	No	Per Half-Hour Use	\$ 33.00
<b>EQUIPMENT: Electrical Characterization</b>			
MMIIProbe 3	No	Per 2 Hour Use	\$ 142.00
MMIIProbe 2	No	Per 2 Hour Use	\$ 142.00
MMIIProbe 1	No	Per 2 Hour Use	\$ 142.00
Jandel 4-point probe system	No	Per Half-Hour Use	\$ 8.00
<b>EQUIPMENT: Photomasks</b>			
PG	No	Per Mask	\$ 421.00
IR	No	Per Mask	\$ 324.00
RET	No	Per Mask	\$ 90.00
Transparency	No	Per Mask	\$ 33.00
<b>EQUIPMENT: Miscellaneous</b>			
Xef Etcher	No	Per 1 Hour Use	\$ 57.00
Parylene CVD	No	Per 4 Hour Use	\$ 150.00
FiJi200 ALD	No	Per Use	\$ 110.00
DiscoDad Dicing Saw	No	Per 1 Hour Use	\$ 73.00
Critical Point Driver (CPD)	No	Per 1 Hour Use	\$ 36.00
CMP	No	Per 1 Hour Use	\$ 57.00
Disco Dad Dicing Saw #2	No	Per 1 Hour Use	\$ 88.00
Easy Tube 3000 ALD	No	Per 2 Hour Use	\$ 76.00
Jipelec RTA	No	Per 1 Hour Use	\$ 48.00
Heidleburg	No	Per 2 Hour Use	\$ 429.00
Bruker Optical Profileometer	No	Per Half-Hour Use	\$ 24.00
<b>EQUIPMENT: Bonders &amp; STS</b>			
STS_AOE	No	Per 1 Hour Use	\$ 93.00
STS_ASE	No	Per 1 Hour Use	\$ 93.00
Panasonic	No	Per Hour	\$ 281.00
Stress Machine	No	Per Half-Hour Use	\$ 113.00
West Bond	No	Per 1 Hour Use	\$ 165.00
Wire Bonder #1 (KNS)	No	Per 1 Hour Use	\$ 31.00
Wire Bonder #2 (KNS)	No	Per 1 Hour Use	\$ 31.00
JFP Wire Bonder	No	Per 1 Hour Use	\$ 31.00
KNS4526 Ribbon Bonder	No	Per 1 Hour Use	\$ 31.00
Small Wire Bonding Package	No	Per Package	\$ 16.00
Large Wire Bonding Package	No	Per Package	\$ 39.00
<b>METALS:</b>			
Gold	No	Per Nanometer	\$ 1.09
Platinum	No	Per Nanometer	\$ 2.43
Palladium	No	Per Nanometer	\$ 0.20
Scandium	No	Per Nanometer	\$ 4.77
All Other Metals	No	Per Nanometer	\$ 0.15

\*\$13k Annual cap refers to the \$13,000 per user, per account CAP on a fiscal year basis

\*\*8 Days Monthly cap refers to a max of 8 days paid per month in access fees per user, per account

# BIRCK NANOTECHNOLOGY OUTSIDE LABS NON-PROFIT RATES

## LAB ACCESS (CHARGE BASED ON HIGHEST LEVEL ENTERED)

MACHINE/PROCESS	CAP?	UNIT	RATE
DRY LAB ACCESS CHARGE - LEVEL ONE	8 days Monthly	Per Day	\$22.00
SOLVENT LAB ACCESS CHARGE - LEVEL TWO	8 days Monthly	Per Day	\$69.00
ACID LAB ACCESS CHARGE - LEVEL THREE	8 days Monthly	Per Day	\$100.00

\*Cap is per user, per project per fiscal year

## BIOLOGY LABS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
BioLabs Access	8 days Monthly	Per Day	\$48.00
Zetasizer	No	Per Hour	\$7.00
Olympus FV1000 Confocal Microscope	No	Per Hour	\$39.00
Cell Culture BioHood Surcharge	No	Per Month	\$39.00
Special Projects Hourly Staff Rate	No	Per Hour	\$85.00

## ELECTRON MICROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Hitachi S-4800 Field Emission SEM (s-4800)	No	Per Hour	\$48.00
Titan 80-300 kV Environmental Electron Microscope (titan_80_300)	No	Per Hour	\$170.00
FEI Nova 200 NanoLab DualBeam TM-SEM/FIB (nova_200)	No	Per Hour	\$107.00
SPI Sputter Coater (SPI_sputter_coater)	No	Per Run	\$41.00
Electron Microscopy Staff Rate	No	Per Hour	\$56.00

## ATOMIC FORCE MICROSCOPY RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Nanotech AFM 1	No	Per Hour	\$39.00
Nanotech AFM 2	No	Per Hour	\$39.00
Agilent 5500	No	Per Hour	\$39.00
Asylum MFP3D Bio AFM	No	Per Hour	\$68.00
Asylum Cypher	No	Per Hour	\$68.00

\*Cap is per user, per project per fiscal year

## EPITAXY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Electrodeposition	No	N/C	N/A
XRD (xrd) - normal scan	No	Per Hour	\$85.00
XRD (xrd) - rsm scan	No	Per Run	\$510.00
OMVPE Aixtron (aixtron)	No	Per Run	\$282.00
Nitride Sputter System (nitride_sputtering)	No	Per Run	\$138.00
Oxide PLD System (pld)	No	Per Run	\$136.00
Epitaxy Staff Rate	No	Per Hour	\$82.00

## OPTICS AND SPECTROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Spectrophotometer Lambda	No	Per Hour	\$105.00
Micro-sample Spectrometer	No	Per Hour	\$108.00
Raman Spectrometer T64000	No	Per Hour	\$48.00
NSOM/Luminescence Mapping	No	Per Run	\$122.00
V-VASE Spectroscopic Ellipsometer	No	Per Hour	\$25.00
Optics Staff Rate	No	Per Hour	\$102.00

<b>RAITH E-BEAM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Raith E-Line E-beam (raith)	No	Per Hour	\$61.00
Raith E-Beam Staff Rate	No	Per Hour	\$74.00
<b>MPCVD EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
MPCVD (MPCVD)	No	Per Use	\$96.00
MPCVD Staff Rate	No	Per Hour	\$82.00
<b>SURFACE ANALYSIS AND SPM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Kratos XPS Analysis Time (xps - staff)	No	Per Hour	\$108.00
Kratos XPS Instrument Time (xps)	No	Per Hour	\$96.00
Glovebox	No	Per Hour	\$39.00
Omicron (omicron)	No	Per Run	\$185.00
<b>LASER DOPPLER VIBROMETRY EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Micro System Analyzer (polytec_laser_vibrometer)	No	Per Hour	\$10.00
Vaccum Chamber (Suss_PLV50_ProbeStation)	No	Per Hour	\$21.00
LDV Staff Rate	No	Per Hour	\$56.00
*Cap is per user, per project per fiscal year			
<b>FEMTOSECOND LASER &amp; RAMAN SPECTROSCOPY RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Femtosecond Laser	No	Per Hour	\$47.00
Raman Spectrometer	No	Per Hour	\$42.00
Training/Staff Time	No	Per Hour	\$57.00
<b>THERMOELECTRIC CHARACTERIZATION RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Z-Meter (z_meter)	No	Per Hour	\$16.00
Bulk (TE_bulk)	No	Per Hour	\$16.00
Thin Film (TE_ThinFilm)	No	Per Hour	\$16.00
Training/Staff Time	No	Per Hour	\$48.00

Rates current as of July 1, 2013

For more information or questions, please contact:

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## BIRCK NANOTECHNOLOGY SCIFRES CLEANROOM CORPORATE RATES

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>SERVICE CHARGES:</b>			
Cleanroom Daily Access Fee	8 Days Monthly	Per Day	\$ 79.00
Training Time	No	Per Hour	\$ 111.00
Engineering Staff Time	No	Per Hour	\$ 142.00
Process Scientist Staff Time	No	Per Hour	\$ 149.00
<b>EQUIPMENT: Metallization</b>			
Airco E-Beam Evaporator	No	Per 4 Hour Use	\$ 356.00
Cha E-Beam Evaporator	No	Per 4 Hour Use	\$ 356.00
Leybold E-Beam Evaporator	No	Per 4 Hour Use	\$ 356.00
Perkin Elmer 2400 Sputterer	No	Per 4 Hour Use	\$ 356.00
Varian E-Beam Evaporator	No	Per 4 Hour Use	\$ 356.00
PVD Electron Beam Evaporator #1	No	Per 2 Hour Use	\$ 356.00
PVD Electron Beam Evaporator #2	No	Per 4 Hour Use	\$ 356.00
Veeco Thermal Evaporator	No	Per 4 Hour Use	\$ 356.00
Kurt J Lesker E-Beam	No	Per 3 Hour Use	\$ 356.00
PVD Sputtering System - Metals/Dielectrics	No	Per 2 Hour Use	\$ 212.00
PVD Sputtering System - Magnets	No	Per 2 Hour Use	\$ 212.00
Vistec E-Beam (VB6)	No	Per Hour	\$ 511.00
<b>EQUIPMENT: Testing</b>			
Veeco Dimension AFM	No	Per 1 Hour Use	\$ 48.00
Dimension 3100 AFM	No	Per 1 Hour Use	\$ 100.00
Alpha-Step IQ	No	Per Half-Hour Use	\$ 16.00
Filmetrics	No	Per Half-Hour Use	\$ 30.00
Olympus BX-60 Microscope	No	Per Half-Hour Use	\$ 13.00
Ellipsometer	No	Per Half-Hour Use	\$ 23.00
JEOL JCM-5000 Table Top SEM	No	Per Half-Hour Use	\$ 53.00
MMR Probe Station #2	No	Per 2 Hour Use	\$ 181.00
<b>EQUIPMENT: Furnaces</b>			
Blue M Oven	No	Per 1 Hour Use	\$ 151.00
Ammonia (NH3) Anneal	No	Per 1 Hour Use	\$ 49.00
Nitric Oxide Anneal	No	Per 1 Hour Use	\$ 34.00
Silicon Carbide Anneal	No	Per 1 Hour Use	\$ 34.00
Pyrogenic Oxidation	No	Per 4 Hour Use	\$ 244.00
RTA Heatpulse 610	No	Per 1 Hour Use	\$ 37.00
RTA MiniPulse	No	Per 1 Hour Use	\$ 37.00
ProTemp Tube_01	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_02	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_03	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_04	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_05	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_06	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_07	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_08	No	Per 1 Hour Use	\$ 104.00
ProTemp Tube_09	No	Per 1 Hour Use	\$ 104.00
<b>EQUIPMENT: Plasma (Etch)</b>			
Branson	No	Per 1 Hour Use	\$ 27.00
Axic CVD	No	Per 2 Hour Use	\$ 149.00
Plasma Tech RIE	No	Per Half-Hour Use	\$ 41.00
ASE Etcher	No	Per 1 Hour Use	\$ 105.00

Scifres Nanotechnology Cleanroom Rate Schedule:	CAP?	Billable Unit	User Charge
<b>EQUIPMENT: Photolithography</b>			
MJB-1 Wafer Aligner	No	Per Half-Hour Use	\$ 25.00
MJB-2 Wafer Aligner	No	Per Half-Hour Use	\$ 25.00
Suss MA-6 Mask Aligner	No	Per Half-Hour Use	\$ 27.00
Spinner #1	No	Per Half-Hour Use	\$ 13.00
Spinner #2	No	Per Half-Hour Use	\$ 13.00
Nanonex NX-2000 Nanoimprinter	No	Per 1 Hour Use	\$ 76.00
Suss SB6e Substrate Bonder	No	Per 1 Hour Use	\$ 95.00
MA-24 Mask Aligner	No	Per Half-Hour Use	\$ 37.00
<b>EQUIPMENT: Electrical Characterization</b>			
MMIIProbe 3	No	Per 2 Hour Use	\$ 161.00
MMIIProbe 2	No	Per 2 Hour Use	\$ 161.00
MMIProbe 1	No	Per 2 Hour Use	\$ 161.00
Jandel 4-point probe system	No	Per Half-Hour Use	\$ 9.00
<b>EQUIPMENT: Photomasks</b>			
PG	No	Per Mask	\$ 478.00
IR	No	Per Mask	\$ 368.00
RET	No	Per Mask	\$ 102.00
Transparency	No	Per Mask	\$ 37.00
<b>EQUIPMENT: Miscellaneous</b>			
Xef Etcher	No	Per 1 Hour Use	\$ 65.00
Parylene CVD	No	Per 4 Hour Use	\$ 170.00
FiJi200 ALD	No	Per Use	\$ 125.00
DiscoDad Dicing Saw	No	Per 1 Hour Use	\$ 83.00
Critical Point Driver (CPD)	No	Per 1 Hour Use	\$ 41.00
CMP	No	Per 1 Hour Use	\$ 65.00
Disco Dad Dicing Saw #2	No	Per 1 Hour Use	\$ 100.00
Easy Tube 3000 ALD	No	Per 2 Hour Use	\$ 86.00
Jipelec RTA	No	Per 1 Hour Use	\$ 55.00
Heidleburg	No	Per 2 Hour Use	\$ 487.00
Bruker Optical Profileometer	No	Per Half-Hour Use	\$ 27.00
<b>EQUIPMENT: Bonders &amp; STS</b>			
STS_AOE	No	Per 1 Hour Use	\$ 105.00
STS_ASE	No	Per 1 Hour Use	\$ 105.00
Panasonic	No	Per Hour	\$ 319.00
Stress Machine	No	Per Half-Hour Use	\$ 128.00
West Bond	No	Per 1 Hour Use	\$ 188.00
Wire Bonder #1 (KNS)	No	Per 1 Hour Use	\$ 35.00
Wire Bonder #2 (KNS)	No	Per 1 Hour Use	\$ 35.00
JFP Wire Bonder	No	Per 1 Hour Use	\$ 35.00
KNS4526 Ribbon Bonder	No	Per 1 Hour Use	\$ 35.00
Small Wire Bonding Package	No	Per Package	\$ 18.00
Large Wire Bonding Package	No	Per Package	\$ 44.00
<b>METALS:</b>			
Gold	No	Per Nanometer	\$ 1.09
Platinum	No	Per Nanometer	\$ 2.43
Palladium	No	Per Nanometer	\$ 0.20
Scandium	No	Per Nanometer	\$ 4.77
All Other Metals	No	Per Nanometer	\$ 0.15

\*\$13k Annual cap refers to the \$13,000 per user, per account CAP on a fiscal year basis

\*\*8 Days Monthly cap refers to a max of 8 days paid per month in access fees per user, per account

# BIRCK NANOTECHNOLOGY OUTSIDE LABS CORPORATE RATES

## LAB ACCESS (CHARGE BASED ON HIGHEST LEVEL ENTERED)

MACHINE/PROCESS	CAP?	UNIT	RATE
DRY LAB ACCESS CHARGE - LEVEL ONE	8 days Monthly	Per Day	\$25.00
SOLVENT LAB ACCESS CHARGE - LEVEL TWO	8 days Monthly	Per Day	\$79.00
ACID LAB ACCESS CHARGE - LEVEL THREE	8 days Monthly	Per Day	\$114.00

\*Cap is per user, per project per fiscal year

## BIOLOGY LABS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
BioLabs Access	8 days Monthly	Per Day	\$55.00
Zetasizer	No	Per Hour	\$7.00
Olympus FV1000 Confocal Microscope	No	Per Hour	\$44.00
Cell Culture BioHood Surcharge	No	Per Month	\$44.00
Special Projects Hourly Staff Rate	No	Per Hour	\$97.00

## ELECTRON MICROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Hitachi S-4800 Field Emission SEM (s-4800)	No	Per Hour	\$55.00
Titan 80-300 kV Environmental Electron Microscope (titan_80_300)	No	Per Hour	\$193.00
FEI Nova 200 NanoLab DualBeam TM-SEM/FIB (nova_200)	No	Per Hour	\$121.00
SPI Sputter Coater (SPI_sputter_coater)	No	Per Run	\$46.00
Electron Microscopy Staff Rate	No	Per Hour	\$63.00

## ATOMIC FORCE MICROSCOPY RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Nanotech AFM 1	No	Per Hour	\$77.00
Nanotech AFM 2	No	Per Hour	\$77.00
Agilent 5500	No	Per Hour	\$77.00
Asylum MFP3D Bio AFM	No	Per Hour	\$136.00
Asylum Cypher	No	Per Hour	\$136.00

\*Cap is per user, per project per fiscal year

## EPITAXY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Electrodeposition	No	N/C	N/A
XRD (xrd) - normal scan	No	Per Hour	\$149.00
XRD (xrd) - rsm scan	No	Per Run	\$894.00
OMVPE Aixtron (aixtron)	No	Per Run	\$494.00
Nitride Sputter System (nitride_sputtering)	No	Per Run	\$240.00
Oxide PLD System (pld)	No	Per Run	\$238.00
Epitaxy Staff Rate	No	Per Hour	\$143.00

## OPTICS AND SPECTROSCOPY EQUIPMENT/PROCESS RATE LISTING

MACHINE/PROCESS	CAP?	UNIT	RATE
Spectrophotometer Lambda	No	Per Hour	\$184.00
Micro-sample Spectrometer	No	Per Hour	\$189.00
Raman Spectrometer T64000	No	Per Hour	\$84.00
NSOM/Luminescence Mapping	No	Per Run	\$213.00
V-VASE Spectroscopic Ellipsometer	No	Per Hour	\$44.00
Optics Staff Rate	No	Per Hour	\$178.00

<b>RAITH E-BEAM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Raith E-Line E-beam (raith)	No	Per Hour	\$69.00
Raith E-Beam Staff Rate	No	Per Hour	\$84.00
<b>MPCVD EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
MPCVD (MPCVD)	No	Per Use	\$191.00
MPCVD Staff Rate	No	Per Hour	\$164.00
<b>SURFACE ANALYSIS AND SPM EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Kratos XPS Analysis Time (xps - staff)	No	Per Hour	\$123.00
Kratos XPS Instrument Time (xps)	No	Per Hour	\$109.00
Glovebox	No	Per Hour	\$44.00
Omicron (omicron)	No	Per Run	\$210.00
<b>LASER DOPPLER VIBROMETRY EQUIPMENT/PROCESS RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Micro System Analyzer (polytec_laser_vibrometer)	No	Per Hour	\$11.00
Vaccum Chamber (Suss_PLV50_ProbeStation)	No	Per Hour	\$23.00
LDV Staff Rate	No	Per Hour	\$63.00
*Cap is per user, per project per fiscal year			
<b>FEMTOSECOND LASER &amp; RAMAN SPECTROSCOPY RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Femtosecond Laser	No	Per Hour	\$53.00
Raman Spectrometer	No	Per Hour	\$48.00
Training/Staff Time	No	Per Hour	\$65.00
<b>THERMOELECTRIC CHARACTERIZATION RATE LISTING</b>			
<b>MACHINE/PROCESS</b>	<b>CAP?</b>	<b>UNIT</b>	<b>RATE</b>
Z-Meter (z_meter)	No	Per Hour	\$18.00
Bulk (TE_bulk)	No	Per Hour	\$18.00
Thin Film (TE_ThinFilm)	No	Per Hour	\$18.00
Training/Staff Time	No	Per Hour	\$55.00

Rates current as of July 1, 2013

For more information or questions, please contact:

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