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1 Metrology/Characterisation

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
AFM - Bruker Icon		Tapping and contact mode	B	800
Ellipsometer - Alpha SE	6"	390 - 900 nm; 65/70/75°	A	400
Ellipsometer - Woollam RC2	8"	210 - 2500 nm; 47-75°C	B	800
EQE - Bentham PVE300		PV device characterisation	B	800
FIB-SEM - FEI NanoLab 650		Ga FIB; Omniprobe manupulator, Pt, W, SiOx gas injection	C	1350
PL Mapper - Enlitech		PL, TRPL, EL, LBIC mapping. 675 nm (CW, pulsed), 375 nm CW and 325 nm CW lasers.	B	800
Probe Station - Cascade		-65 - 150°C	B	800
~~Probe station - Karl Suss~~		I-V, C-V, C, R, X, D, G measurements and series	F	0
4p probe - Lucas Labs Pro4-4400		4-point probe resistivity measurement	F	0
Profilometer - Bruker DektakXT		2 um radius stylus, 55 x 55 mm scan area	A	400
SEM - Hitachi SU8010		Cold FEG; SE, E-T, STEM; EBIC 6 I-V measurement	B	800
SEM - Zeiss Gemini 500		Schottky FEG; SE, BSE, EDS, EBSD (Oxford)	C	1350
SEM – Hitachi SU8700	6"	Schottky FEB; in-lens SE & BSE, E-T SE, UVPD, STEM. Bruker FlatQuad EDS	C	1350
Variable Solar Simulator - G2V Pico		PV device characterisation	B	800
XRD - Bruker D8 Discover	4"	Eulerian cradle; Cu K-alpha radiation (1.5406 Å)	B	800
Micro PL UV			B	800
Optical Microscope - OLYMPUS BX53M		Advanced Imaging	A	400
Microscope - Axio Imager A1m Zeiss		Optical microscope Axio Imager A1m, from Zeiss. Integrated with digital camera	F	0
Microscope - Axio Imager M1m Zeiss		Optical microscope	F	0
Microscope - Axioplan Zeiss		Optical microscope with digital camera	F	0
Microscope - Axioskop Zeiss		Optical microscope	F	0
Microscope - Nikon Optiphot		Optical microscope with a digital imaging system	F	0
Tabletop SEM Hitachi		Tabletop SEM for outreach purposes	F	0

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2 Lithography

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
DTL - PhableR 100DUV	4"	193nm; Resolution < 100nm, Max. pitch approx. 1.5µm.	C	1350
EBL - Raith 150	6"	5-30 kV; Min. resolution 10 nm	C	1350
EBL - Raith Voyager	6"	50kV; 40nA probe current; min resolution 10 nm	D	2120
Mask Aligner - MJB4 DUV	4"	240nm to 320nm; mask sizes 3.5", 4" and 5"	B	800
Mask Aligner - MJB4 Soft UV	4"		B	800
Mask-Less Aligner - Heidelberg MLA150	6"	Laser wavelength 375nm & 405nm	D	2120
NIL - Obducat 6" System	6"	Thermal and/or UV-imprint. Max 200°C / 60 bar	C	1350
Off-line EBL		L-Edit	F	0

3 Thin Film

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
ALD - Beneq TFS 200	8"	Thermal and plasma; HfO, Al2O3	C	1350
ALD - Fiji	8"	SiO2, HfO, TiN, Al2O3, AlN	B	800
ALD Picosun Sunale R 100	4"	N2 glovebox; HfO,ZrO, Al2O3	B	800
ALD - Savannah 100		HfO, Al2O3	B	800
E-Beam Evaporator - Temescal	6"	Au, Ti, Ni, Al, Cr, Pd, Cu	C	1350
PECVD - SPTS DELTA LPX APM	6"	Depositions of SiO2, Si3N4 and a-Si	D	2120
Sputter - AJA Orion 5	4"	3 DC & 2 RF magnetrons (2"); low 10-7 mbar; Au, Al, Ni, Mo, W, Ti, Si, SiO2, TiN, ITO	C	1350
Sputter - Quorum Q150T	4"	SEM coater; Pt:Pd (80:20)	B	800
Thermal Evaporator - AVAC	2"	3hr min booking. Tilting and rotating; 7x10-7mbar; Au, Al, Ni, NiCr, FeNi, Pd, Zn, Ti, Ge.	B	800

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4 Etch

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
ICP-RIE – APEX SLR – Cl based	8”	Process gases: Cl2, BCl3, CH4, Ar, O2 and H2. Etching III-V semiconductors, Si, metals and polymers	C	1350
ICP-RIE – APEX SLR – F based	8”	Process gases: SF6, CHF3, CF4, C4F8, Ar, O2, H2, N2. Etching of Si, SiO2, Si3N4, W, Mo and polymers	C	1350
Microwave Plasma – TEPLA IonWave 10	6”	Isotropic etching. Process gases: O2, Ar and CF4	B	800
RF Plasma – Moorfield NanoEtch	3”	Process Gases: O2, Ar, N2	B	800
RIE – Trion T2 – F based	8”	Process gases: CF4, CHF3, SF6, O2 and Ar. Etching Si, SiO2, Si3N4, W, Mo and polymers (resists).	B	800
UV Ozone Cleaner – UVOH150	8”	High intensity UV radiation and ozone creates a hydrocarbon free surface	A	400
Asher – New PlasmaPreen		Simple microwave oxygen plasma ashing system	A	400
~~Ozone cleaner – UVOH 150~~	8”	UV-ozone cleaning system from FHR Anlagenbau GmbH. Heater Temperature up to 250°C	A	400

5 Growth

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
Aerosol System		Gold nanoparticles: 3-100nm in electrical mobility diameter	B	800
MOVPE - Aixtron CCS - 788676	4”	Dedicated for III-V material synthesis (mainly arsenides and phosphides) Available susceptor sizes: 1x 3”, 1x4”, 3x2”. Maximum reactor temperature up to 1000°C	D	2120
MOVPE - Aixtron 200/4	4"	Epitaxial growth III/V semiconductors. GaP, GaAs. In situ HCl etch.	D	2120
MOVPE - Aixtron CCS - 18313	4”	Epitaxial growth III/V semiconductors. Arsenides and antimonides. In situ HCl etch.	D	2120
MOVPE – TNSC GaO		Gallium Oxide MOVPE	D	2120
Pulsed Laser Deposition - TSST		Primarily oxide deposition	D	2120

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6 Special Equipment

Tool Name	Wafer Size	Features	Tool Rate	Hourly Rate, SEK
Bonder - Bondtec 5332		Ultrasonic wire bonding. Au or Al.	C	1350
Bonder - K & S			C	1350
CMP - Logitech Orbis	8"	Chemical Mechanical Polisher. Various templates for smaller wafers and square samples.	C	1350
Critical Point Dryer - K850			A	400
Dicer - Disco DAD 3320	6"	High precision automated wafer dicing	C	1350
RTP - UniTemp 1200-100		N_2, O_2 or forming gas (5% of H_2 + 95% of N_2).	B	800
Flash Lamp Annealer		Flash lamp annealing system using ultrashort flashes. Process gases N_2, O_2 & 5%H_2/95%N_2	C	1350
Hall		Measuring Hall effect and Van der Pauw at RT. The maximum magnetic field is +/- 2.5 T	B	800
Tensometer - Theta Lite		Measuring contact angles liquid/solid interface.	A	400
3D printer Zortrax		3D printer for ABS, PETG and HIPS	A	400
Oven - EBL		Oven for baking of e-beam and UV-sensitive resists	F	0
Oven - EVA		Oven for baking of e-beam and UV-sensitive resists	F	0
Oven - UVL1		Oven for baking of e-beam and UV-sensitive resists	F	0
Oven - UVL2		Oven for baking of e-beam and UV-sensitive resists	F	0
Safety Cabinet Mars GS 900		Safe environment for mounting of samples for SEM inspection	F	0
Scriber - Karl Süss		Diamond scriber	F	0
Scriber, manual		Manual scriber	F	0

7 Other Services

	Hourly Rate, SEK
Technical Staff time	1400
Workshop fee (staff plus tool)	850
Monthly access fee	2100
Lund Nano Lab Introduction Training	5200