



Australian National Fabrication Facility

Equipment listing

The following comprehensive list includes all equipment that is currently available via ANFF Nodes across Australia. The facilities draw on existing infrastructure and expertise, at the same time a major program of capital expenditure and recruitment is taking place. Hence, the listing also includes details of new instrumentation that will be made available in the coming months.

For further information, please contact a Node directly or the ANFF head office. You can also read the Access and Pricing Policy on this website.

1. Australian Capital Territory Node

All available, except where noted.

- 1.1 Metal Organic Chemical Vapour Deposition Reactors, ANU
- 1.2 Molecular Beam Epitaxy System, UWA
- 1.3 Ion Implanters, ANU
- 1.4 Rutherford Backscattering Spectrometry, ANU
- 1.5 Optical Lithography, UWA and ANU
- 1.6 PECVD Deposition Systems, UWA and ANU
- 1.7 Pulsed Laser Deposition System, ANU
- 1.8 E-beam and thermal evaporators, UWA and ANU
- 1.9 Reactive Ion Etching System, UWA and ANU
- 1.10 Inductively Coupled Plasma Etching & Deposition System, UWA and ANU
- 1.11 Rapid Thermal Annealing System, UWA and ANU
- 1.12 Wire-Bonder, UWA and ANU
- 1.13 High resolution x-ray diffractometers, ANU
- 1.14 I-V, C-V, DLTS, Hall Effect Measurement Systems, UWA and ANU
- 1.15 Optical Characterisation Facilities, UWA
- 1.16 MEMS Characterisation Facilities, UWA
- 1.17 General Clean Room Facilities, UWA and ANU
- 1.18 RF/DC sputtering system, ANU

- 1.19 E-beam Lithography Facility, ANU
- 1.20 Dual Frequency PECVD, ANU
- 1.21 Nano Imprint Lithography– to be ordered
- 1.22 Focused Ion Beam – to be ordered

2. Queensland Node

Soft Materials Processing Facility

All available

- 2.1 National synthesis facility for functional organics
- 2.2 Glove box with integrated vacuum evaporators
- 2.3 157 nm F2 laser exposure system
- 2.4 Organic device testing and characterisation
- 2.5 Thermal analysis/characterisation suite; DMA, TGA, DSC
- 2.6 Vibrational spectroscopy suite; FTIR, ATR-FTIR, NIR; Raman Chromatography suite; GPC (organic and aqueous solvents), HPLC, GC/MS Electrochemistry

BioNano Device Fabrication Facility

All available

- 2.7 UV Mask Aligner
- 2.8 Direct write laser lithography
- 2.9 Hot embossing and lamination
- 2.10 High throughput DNA screening facility
- 2.11 Biomolecular synthesis facility
- 2.12 Biopolymer processing equipment
- 2.13 Polymer fibres and nanocomposites manufacturing facility

3. New South Wales Node - University of NSW

Availability noted below

- 3.1 Class 3.5 Cleanrooms (existing SNF) - available
- 3.2 Ultra-High-Resolution EBL Tool (FEI Sirion) - available
- 3.3 100keV EBL Tool (Leica EBL-100) – off-line during construction
- 3.4 Scanning Electron Microscope (LEO S440) – off-line during construction
- 3.5 Atomic Force Microscope (DI-3100) - available
- 3.6 Optical Lithography Tools (Quintell x 2) - available
- 3.7 Silicon Furnace Stacks - available
- 3.8 ICP Reactive Ion Etch Tool (STS) – off-line during construction
- 3.9 Cleanrooms 1 & 2 (SNF extension) – under construction
- 3.10 Large area EBL (Raith 150TWO) – on order
- 3.11 Wet Process Tools – to be ordered
- 3.12 Multisource Refractory Layer Tool – to be ordered
- 3.13 LPCVD Furnace Stack – to be ordered
- 3.14 PECVD Deposition Tool – to be ordered

4. South Australian Node

Availability noted below

Microfluidics Fabrication Facility

- 4.1 UV-Lithography Suite –available March 09
- 4.2 Deep Reactive Ion Etching –available March 09

Surface Treatment Facility

- 4.3 Radio Frequency Plasma Reactor – available March 09
- 4.4 Micro Plasma Pen – available March 09
- 4.5 Spray Polymerisation Reactor – available March 09
- 4.6 Dip Coater – available March 09

Patterning and Texturing Facility

- 4.7 Sputter Deposition System – available June 09
- 4.8 Direct Write Deposition System – available June 09
- 4.9 CNC Micromilling System – available June 09

5. OptoFab Node

All available

Optical Fibre Technology Centre – University of Sydney

- 5.1 Polymer fibre draw tower
- 5.2 Optical fibre tapering / nanowire facilities
- 5.3 Optic fibre prolifer (EXFO NR9200 HR)

Bandwidth Foundry International

Physical plant

- 5.4 Class 100 / 1000 Cleanroom Facilities
- 5.5 Nitrogen System
- 5.6 Compressed Dry Air System
- 5.7 DI Water System

Processing Equipment (Main Items only)

- 5.8 Heidelberg Instruments Direct Write Laser 200
- 5.9 3 wet benches
- 5.10 UV Fusion oven
- 5.11 Karl Suss Model Ct/62 Spin Coater
- 5.12 Lasertec Scanning Laser Micros
- 5.13 Karl Suss Model PM5 Probe Stat
- 5.14 PM-Plast Mask Cleaning Wet Bench
- 5.15 Nikon Optiphot Model 150 Microscope
- 5.16 PMS Handilaz Particle Counter
- 5.17 Dektak 8 Adv Stylus Profiler
- 5.18 Mask aligner
- 5.19 Electrical Poling System
- 5.20 Annealed Proton Exchange System
- 5.21 Annealing oven
- 5.22 Reverse Proton Exchange System
- 5.23 Dicing saw
- 5.24 Lapping machine
- 5.25 Polishing machine
- 5.26 Inspection microscope
- 5.27 Metricon Prism Coupler

5.28 Design Tools (Software and Computers)

Macquarie University Laser Microfab

5.29 Nanosecond laser microfabrication facility

5.30 Femtosecond laser microfabrication facility (on a limited basis)

5.31 Reflection phase contrast microscope (Olympus)

5.32 Transmission phase contrast microscope (Olympus)

5.33 Metrology microscope

5.34 Pre and post processing equipment (ultrasonic drills, optical polishing equipment etc)

6. Materials Node

All available

University of Wollongong

- 6.1 Aqueous Gel Permeation Chromatography (GPC)- Waters
- 6.2 Electrochemical Electron Spin Resonance Spectrometry (ESR) – Bruker EMX
- 6.3 Raman (Electrochemical stage) – JY HR 800
- 6.4 Fluorimeter – JY SPEX Fluorolog 22
- 6.5 AFM – Asylum MFP-3D
- 6.6 Automate CVD
- 6.7 Electrochemical Impedance Spectroscopy
- 6.8 Goniometer – Data Physics

University of Newcastle

- 6.9 2 Glove boxes
- 6.10 Atomate PECVD system
- 6.11 Carey 6000i UV-Vis system
- 6.12 Profilometer
- 6.13 Scanning near-optical microscope
- 6.14 Spin-coating and thin film deposition system
- 6.15 Electrical characterisation facilities
- 6.16 XPS/Auger electron spectroscopy system

7. Victorian Node

Deakin University

All available

- 7.1 LEO 1530 FEG-SEM
- 7.2 JEOL TEM
- 7.3 LEICA S440 W-SEM
- 7.4 Plasma Machine Atmospheric Vacuum
- 7.5 Polymer Blending Line
- 7.6 Filament Extrusion
- 7.7 Polymer Characterization DSC
- 7.8 DMA
- 7.9 Metalog Facilities

RMIT University

All available

- 7.10 Photolithography
- 7.11 Au electroplating
- 7.12 Annealing furnace
- 7.13 Profiler
- 7.14 Electron beam evaporation
- 7.15 Thermal evaporation
- 7.16 RF sputter deposition
- 7.17 Plasma etcher
- 7.18 Diamond dicing saw
- 7.19 Optical polishing
- 7.20 Wire bonder

La Trobe University

All available

- 7.21 Time of Flight-Secondary Ion Mass Spectroscopy
- 7.22 X-ray Photoelectron Spectroscopy
- 7.23 Atomic Force Microscopy
- 7.24 XCT
- 7.25 e-beam
- 7.26 Reactive Ion Etching

7.27 Sputtering

University of Melbourne

All available

- 7.28 Atomic scale imaging (Transmission electron microscopy, STM, in vacuum, air and at different temperatures)
- 7.29 Ultra high field nuclear magnetic resonance spectroscopy
- 7.30 Advanced spectroscopic techniques, allowing detection and characterisation of single nanoparticles
- 7.31 Agilent 8453 UV-VIS Spectrophotometer
- 7.32 Cary 4000 UV-VIS Spectrophotometer (with diffuse reflectance accessory)
- 7.33 Ellipsometry
- 7.34 Quartz crystal microgravimetry
- 7.35 Raman spectroscopy
- 7.36 Varian 7000 Fournier Transform-IR Spectrophotometer
- 7.37 Dynamic light scattering
- 7.38 Malvern HPPS particle sizer (DLS)
- 7.39 Malvern Zetasizer
- 7.40 Automated Sample Handling
- 7.41 JEOL JAFM 4500XT UHV AFM which is capable of CITS, lateral force, scanning Kelvin and modulation imaging modes with atomic resolution. It also features the following in-situ surface treatment facilities: an argon ion gun, e-beam evaporator, cleaver and atomic hydrogen source.
- 7.42 Staib Surface Spectroscopy facility was installed on this system in 2002 and includes: a micro-focus electron gun with scintillating detector (SEM), cylindrical mirror analyser (CMA) with integral electron gun for Auger spectroscopy and scanning Auger mapping (SAM) and an X-ray source for XPS analysis.
- 7.43 JEOL AFM (JSTM 4200A) with an ambient/high vacuum sample environment used for routine analysis.
- 7.44 Nanonics NSOM/AFM, coupled to the Renishaw micro-Raman spectrometer.
- 7.45 NT-MDT SMENA portable AFM
- 7.46 NEC 5U Pelletron, operating as a high brightness source of light ions operating at charging potentials of 0.5 to 5 MeV.
- 7.47 Ion Implantation
- 7.48 Rutherford Backscattering (RBS)
- 7.49 Proton Induced X-ray emission (PIXE)
- 7.50 Ion Beam Induced Charge measurements (IBIC)
- 7.51 Channelling Contrast Microscopy (CCM)

- 7.52 Scanning Transmission Ion Microscopy (STIM)
- 7.53 Orsay Physics Focussed Ion Beam (FIB) with crossed electron beam for performing concurrent SEM measurements
- 7.54 Colutron low energy ion implanter (0.01-15 keV) predominantly used for phosphorus implantation of Quantum Devices
- 7.55 Class 350 Cleanroom
- 7.56 Class 35 laminar flow cabinet
- 7.57 Astex microwave HPMD/ECR system for diamond coating
- 7.58 Wet chemical processing facility
- 7.59 Inert gas furnace annealing
- 7.60 Time-resolved reflectivity
- 7.61 Neutronix Quintel Q4000-6 UV Photolithographic Processing
- 7.62 Class 350 Cleanroom
- 7.63 Star Cryo-electronics DC SQUID
- 7.64 SULA Deep Level Transient Spectroscopy system (DLTS)
- 7.65 Dilor XY triple grating, high resolution spectrometer
- 7.66 Reinshaw RM 1000 single grating, extended wavelength Raman/luminescence system, including a Coherent 190 FRED, Kimmon HeCd and Stellar Pro 514 Modulaser
- 7.67 Micro-Raman Spectrometer

Monash University

All available

- 7.68 Lithography suite, including items 180 to 183 below...
- 7.69 SUSSMicrotec Delta 80RC spinner
- 7.70 SUSSMicrotec MA6 Aligner
- 7.71 Wet etch suite
- 7.72 Vacuum oven, small spin coater, other general equipment in class 1000 area, and class 1000 area access
- 7.73 Hummer DC/RF sputtering system
- 7.74 Plasma etcher
- 7.75 Wire bonding
- 7.76 Diamond scribing system
- 7.77 Micromanipulator station
- 7.78 Polytec PI MEMS LDV MSA-400 3D vibrometer
- 7.79 Optical microscopy beyond incidental use
- 7.80 Cleanroom 10000 area, including air bearing supported 25ft floor and optical table

- 7.81 Dantec MicroParticle Image Velocimeter
- 7.82 Agilent 4294A impedance analyser
- 7.83 GRAPHTEC laser Doppler vibrometer
- 7.84 High-speed microvideography (Olympus iSpeed)
- 7.85 High-speed microvideography (USB)
- 7.86 Olympus fluorescence microscopy (boom unit)
- 7.87 TSI Scanning Mobility Particle Sizer
- 7.88 Advantest R3762A Network Analyser
- 7.89 High-voltage, pulse, high-frequency signal generation
- 7.90 Analysis workstations w/ANSYS, COMSOL, Mathematica, LinkCAD

Swinburne University of Technology

All available

- 7.91 Thin Film Deposition System (K.J. Lesker CMS-18)
- 7.92 Atomic Force Microscope (NTMDT PL7)
- 7.93 Optical microscopy

CSIRO

All available except Item 7.94

- 7.94 Electron Beam Lithography System – available August 08
- 7.95 Resist spinner
- 7.96 ABM UV collimated flood light source
- 7.97 Optical Microscopes
- 7.98 Karl Suss MJB-30 mask aligner
- 7.99 Vacuum oven and Digital Hot Plates
- 7.100 Disco Wafer dicing saw
- 7.101 STS 320 Reactive ion etch system
- 7.102 Plasma Polymerisation apparatus
- 7.103 Hot roll lamination system
- 7.104 Micro-spot welder (programmable, dual pulse)
- 7.105 Wire bonding machine

Melbourne Centre for Nanofabrication

All to be ordered

- 7.106 Electron Beam Lithography System
- 7.107 Photolithography (Mask Aligner)

- 7.108 Nano Imprint Lithography/Hot Embossing
- 7.109 UV flood light exposure source
- 7.110 Extra Mask Aligner
- 7.111 Storage/bench space
- 7.112 Dual-Beam Focussed ion beam-SEM
- 7.113 Organic Polymer/Solar Cell glove box with evaporative/spin coaters
- 7.114 Reactive Ion Etcher system and gas cabinets
- 7.115 PE CVD – (Plasma Enhanced)
- 7.116 PVD – Evaporation
- 7.117 PVD – Sputtering
- 7.118 e-Beam Evaporator
- 7.119 Ellipsometer
- 7.120 Dip Pen Lithography
- 7.121 Spotter (for bio and non-bio)
- 7.122 Ink-jet Printer
- 7.123 Wet – chemical etch stations
- 7.124 Spinner (Hard Matter)
- 7.125 Profilometer
- 7.126 Electroforming – DC
- 7.127 Precision electroplating of gold and other metals
- 7.128 Optical Microscopy
- 7.129 Gas cabinet for etch systems
- 7.130 Optical Microscopy
- 7.131 Programmable hotplate
- 7.132 Screen printer
- 7.133 Barrel plasma etcher (asher)
- 7.134 Vacuum oven
- 7.135 Curing oven (with exhaust)
- 7.136 Lamination
- 7.137 Plasma Polymerisation Reactor
- 7.138 BioEngineering (Hoods)
- 7.139 Fluorescent microscopy
- 7.140 Heat sterilization/Autoclave
- 7.141 UV sterilization
- 7.142 Ultrasonicator

- 7.143 Bio hazard cabinets
- 7.144 Minus 80 deg C freezer
- 7.145 4 degree freezer
- 7.146 Incubators
- 7.147 Computer controlled system for polymer embossing, wafer bonding
- 7.148 Confocal microscope
- 7.149 AFM (Soft + Hard Matter)
- 7.150 FTIR (microscope)
- 7.151 Particle size tester – Zeta sizer
- 7.152 Surface mobility particle size analyser
- 7.153 Rotary Koater reel-to-reel printer
- 7.154 Solartron Impedance analyser
- 7.155 Fourier Transform Infrared Spectrometer
- 7.156 Tube furnaces – controlled atmosphere
- 7.157 Spinner (Soft Matter)
- 7.158 Basic Electronics Lab
- 7.159 Optical Microscopy
- 7.160 Water purifier
- 7.161 Surface Tension Measurement
- 7.162 High speed video
- 7.163 Metallographic Lapping and Polishing specimen prep.
- 7.164 Homogenizer (larger number is for scale up)
- 7.165 Saw- Diamond blade or wire
- 7.166 Controlled light room/darkroom
- 7.167 Automated thin film dip coater
- 7.168 Lab balances and stirrers, glassware
- 7.169 4-point probe station
- 7.170 Contact angle analysis
- 7.171 Laminar flow cabinets
- 7.172 Diamond Scribe
- 7.173 Pressure ultrafiltration
- 7.174 Viscometer
- 7.175 UV-VIS-NearIR
- 7.176 Workshop prep area
- 7.177 Glassware washer

7.178 Baffle furnace

7.179 Filtration

7.180 Vortexer

7.181 Doctor blade

7.182 Heat sealing