Advanced Characterisation Access Request

**APPLICANT INFORMATION**

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| **Name** |  |
| **Contact numbers** | Telephone: Mobile:  |
| **Email** |  |
| **Department/****School/Centre** |  |
| **Course/Position** |  Undergraduate thesis student  Masters by research student Masters by coursework student PhD student Visiting student (domestic) Visiting student (International) Visiting academic Post-doctoral research staff Academic staff member Other (Provide details) |
| **Supervisor Details** | Name |Telephone |e-Mail |Department | |
| **Co-supervisor Details** | Name |Telephone |e-Mail |Department | |
| **Co-supervisor Details** | Name |Telephone |e-Mail |Department | |
| **Describe your previous experience** (e.g., what instruments you have used, how many sessions you had, and what level of assistance you required) |  |
| **Project duration** | Start date: Expected end date:  |

**PROJECT INFORMATION**

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| Project **Title**  |
| What material are you studying?(e.g. aluminium, polyethylene, metallic thin film, metal powder, biological, ceramic, glass fibre composite, ferrous alloy, wool fibres, etc.) |
| Is your material ferro-magnetic?  yes  no  not sure |
| Does your material contain carbon fibres?  yes  no  not sure |
| Are there any health and safety risks associated with this material? Does it contain any radioactive, explosive, infectious, corrosive or toxic substances (e.g. lead, beryllium, cadmium, mercury, PCBs, dioxins, sodium azide)? |
| What are the features of interest in your material and what do you need to find out about them?(e.g. Polymer phase identification. Investigate phase distributions in multi-phase polymers.)*Include images or references if possible.* |
| At what scale you expect to observe the features of interest? (e.g. 7 m diameter fibres in a composite, or 15 nm precipitates in steel) |
| Approximately how many samples do you need to examine for this project? |

**ANALYSIS REQUIREMENTS**

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| Indicate the techniques required to complete your investigation.* *Discuss your choices with microscopy staff if you are uncertain.*
* *If the Advanced Characterisation Facility does not offer the analysis you require, facility staff will*

 *recommend a suitable alternative.** *Short-term researchers will not be trained in some techniques due to time limitations. In this case,*

 *someone will operate for you.** *Very advanced research work such as site-specific atom probe tomography, in-situ deformation, and*

 *correlative microscopy are not recommended for students or inexperienced research staff.* **\*\*Discuss selection of techniques with your supervisor before submitting\*\*** |

**Scanning Electron Microscopy (SEM)**

 Imaging (secondary or backscattered electron imaging)

 Energy dispersive spectrometry (EDS)

 Variable pressure

 In-situ straining, heating or electrical measurements

 Electron back-scattered diffraction (EBSD)

 EBSD strain mapping with Cross Court

**Focused Ion Beam (FIB)**

 Ion imaging

 Nano-/Micro-fabrication

 Single Section Analysis

 2D imaging

 2D EDS

 2D EBSD

 Multi-section Analysis

 3D imaging

 3D EDS

 3D EBSD

 Site specific TEM specimen preparation

 Atom Probe Tomography specimen preparation

 Needle sharpening

 Site specific lift out

**Transmission electron microscopy (TEM)**

 Bright field imaging

 Scanning TEM (bright field and HAADF)

 Energy dispersive spectrometry (EDS)

 Electron energy loss spectrometry (EELS)

 Selected area or convergent beam electron diffraction

 In-situ straining or heating

 Electron tomography

 Automated crystal orientation mapping

**Atom Probe Tomography (APT)**

 Atom probe tomography

 Field ion microscopy

**X-ray diffraction (XRD)**

 Standard 2-theta scanning (wide angle XRD)

 Texture

 Residual stress

 Quantitative analysis (peak broadening, peak shifting, Reitvelt)

 In-situ heating or straining

**Nano-characterisation**

 Nano-hardness / nano-indentation

 Atomic force microscopy (AFM)

**General Microscopy**

 Confocal microscope (Leica SP5)

**Advanced correlative microscopy** (e.g. Complex multi-instrument experiments)

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**SAMPLE PREPARATION**

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| How do you plan to prepare your samples? Have you spoken to other researchers about sample preparation? Do you have a published paper to guide you? Please describe in **detail.** |

Please indicate which of the following you may require:

 Ultra-microtome

 Critical point dryer

 Metallography

 Accutom

 Electro-polishing for EBSD

 Electro-polishing for TEM

 Electro-polishing for atom probe tomography

 Ion polisher (PIPS for TEM sample prep.)

 FIB for site-specific sample prep.

 Dimple grinder

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| When will your samples be ready for analysis? |

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| Do you have any further comments or requests for the Advanced Characterisation team? |

Notes from Access meeting:

Date:

People present:

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| What is being characterised?What sample preparation methods have been recommended?What instruments will be used?Who should the researcher contact now? |

**ELECTRON MICROSCOPY FACILITY CONTACTS**

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| Facility Manager: Andrew Sullivan sullivan@deakin.edu.au desk: 3468 mobile: 0439 340 070 Areas of Expertise: SEM (EDS, EBSD, SE/BSE Imaging, Insitu straining/heating studies)TEM Manager: Rosey van Driel rosey.vandriel@deakin.edu.au desk: 3117 mobile: 0417 399 630 Areas of Expertise: TEM (biological applications, ultramicrotomy)FIB Manager: Mark Nave mark.nave@deakin.edu.au desk: 5227 1126 mobile: 0404 828 742 Areas of Expertise: FIB-SEM (2D/3D EBSD, SE/BSE/ion imaging, EDS)APT Manager: Ross Marceau r.marceau@deakin.edu.au desk: 5227 1283 mobile: 0481 501 642 Areas of Expertise: APT (TEM).Characterisation Adam TaylorSpecialist: adam.taylor@deakin.edu.au**AT** desk: 5227 1304 mobile: 0404 784 677 Areas of Expertise: APT, TEM (diffraction/EDS), FIB (APT fabrication/TEM Sample prep), SEM (EDS/EBSD/imaging). |