

Advice to applicants submitting ARC Discovery Projects for funding commencing in 2021-23 where the Project will use facilities within the Monash Centre for Electron Microscopy

INTRODUCTION

This document provides advice to applicants for ARC Discovery Projects that will require the use of facilities within the Monash Centre for Electron Microscopy (MCEM).

It is extremely costly to maintain and operate advanced electron microscopes and to provide expert staff to train and support microscope users. This cost is born substantially by Monash University with a small fraction contributed by the researcher. When you apply for a research grant you must include and justify these costs in your project budget and proposal.

This document provides advice on how to estimate the amount to request from the ARC for microscopy charges and the amount to be used for the 'Administering Organisation' contribution.

Please note that MCEM fees are **not** considered 'Bench Fees or similar laboratory access fees' as stipulated in the Discovery Program (2019 edition) Grant Guidelines **5.9a** of **What the grant money cannot be used for**. As such MCEM fees may be requested without limitation.

Please contact Dr Peter Miller (Manager, MCEM, peter.miller@monash.edu or Tel: 9905 5291) if you need assistance in assessing the technical feasibility of the electron microscopy component of your proposed project, in estimating the time and resources required for your project, or if you have any other questions regarding the Centre. You should also discuss your proposed project with the Centre manager if you need a large amount of microscope time, say more than 100 hours per year.

INTERNAL CHARGE TO YOUR RESEARCH PROJECT FOR USE OF MCEM

A heavily subsidised **internal charge rate** applies to all microscope usage by Monash University staff or students provided the research is intended for publication with a Monash author *and* does not involve an industry collaborator.

The **internal charge rate is \$42-46/hr** (depending on year) for use of any MCEM electron microscopes (SEMs, TEMs and FIB-SEM) and there is a once-off charge of \$500 for new user training.

There is no additional charge for any subsequent training or assistance or for reasonable use of specimen preparation equipment but the Centre reserves the right to recover costs where this is deemed necessary. If your project requires expensive specimen preparation consumables you may wish to include these in the in your project costs.

This internal charge rate is comparable to or less than that charged by other Go8 universities.

If the project is part of a collaboration with industry a significantly higher **industry charge rate** may apply and you must discuss the project with the MCEM Manager prior to submission of the grant application.

All charges are ex-GST.

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COST TO MONASH UNIVERSITY OF YOUR PROJECT'S USE OF MCEM

The significant additional cost of use of MCEM by your proposed research project, at least \$320/hr, will be covered by Monash University and represents a substantial subsidy of your research project. As this is considered a discount from the full rate this must be entered into the "Cash" column of the Administering Organisation in sections E.

MICROSCOPE COSTS FOR EACH YEAR

Over the years 2021-2023 MCEM will be increasing its usage charges. MCEM has not increased charges in this way for many years, and costs are increasing year on year. As such different hourly costs will need to be entered into your costings in section E1, and justified in your section E2.

Year	Hourly rate
2021	\$42
2022	\$44
2023-onwards	\$46

ESTIMATING TIME REQUIRED PER SAMPLE

It is often difficult to estimate the microscope time needed to examine a sample as this will depend on a wide range of factors. The times given in Table 1 can be used as a guide for routine work on 'straightforward' samples only.

Times may be substantially longer, for example: where technique development is required, for complex samples, where X-ray or EBSD mapping, tomography or automated FIB work is needed, for CBED, STEM, atomic resolution microscopy, EELS and other more complex techniques or for inexperienced microscope users. If in doubt, please discuss with the MCEM Manager.

TABLE 1. GUIDE TO TIME REQUIRED PER SAMPLE FOR ROUTINE WORK ONLY.

Scanning electron microscopy	1-4 hours
Conventional transmission electron microscopy	1-4 hours
Advanced transmission electron microscopy	8-16 hours
Focussed ion beam work	4-8 hours

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EXAMPLE OF PROJECT COSTING – COMPLETING SECTION E1

You need to create a new budget category, for example, 'Microscopy charges', in Part E - Project Costs under 'Other' for each applicable year of the grant and then enter the annual internal charge amount (ARC column) and Administering Organisation amount (Administering Organisation, Cash column).

Table 2 gives an example of how to estimate the annual project costs for use of MCEM.

TABLE2. EXAMPLE COSTING FOR ANNUAL MICROSCOPE USAGE.

Item	Number of samples (per year)	Time per sample (hr)	Charge in 2021 to research project @ internal subsidised rate (\$42/hr)	Contribution to the cost by the Administering Organisation (\$320/hr)
Scanning electron microscopy	40	2	\$3,360	\$25,600
Conventional transmission electron microscopy	6	4	\$ 1,008	\$7,680
Advanced transmission electron microscopy	2	8	\$ 672	\$5,120
Focussed ion beam work	6	4	\$ 1,008	\$7,680
Total Cost (per year)			\$6,048	\$46,080

In this example the total annual *internal* charge to the research project for microscope usage is \$6,048. In addition, the project will require training for two new microscope users adding \$1,000 in the first year.

The total annual amounts that would need to be requested from the ARC for use of MCEM facilities (ARC column) are \$7,048 in the first year, with per hour costs increasing in subsequent years.

In addition, there is a very substantial University contribution to your research project through the University's subsidy of MCEM's operating costs as shown in Table 2, at least \$46,080 in this example.

This is the annual amount contributed by the Administering Organisation (in the Cash column).

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EXAMPLE BUDGET JUSTIFICATION FOR ARC DISCOVERY PROJECT PROPOSAL, SECTION E2

In the ARC Discovery Project application Part E2 - Budget Justifications you must 'Fully justify each budget item requested in terms of need and cost.' This includes the annual microscopy charges entered in Part E1 - Project Costs under 'Other', ARC column and Administering Organisation column.

You must clearly explain why these microscopy techniques are essential for your research project, linking microscopy results to the research program described elsewhere in your application.

You must also justify the microscopy cost in section E2, for example:

'The Monash Centre for Electron Microscopy charges Monash University researchers \$42-46/hr (ex-GST), depending on the year, for microscope use and there is a once-off charge of \$500 for training a new microscope user.

This research project requires examination of samples using facilities provided by the Monash Centre for Electron Microscopy. The estimated number of samples per year, time per sample and cost per sample are given in the table below (*provide table estimating your research requirements*).

In addition, you must justify the Administering Organisation contribution in section E2, for example:

'The Monash Centre for Electron Microscopy provides advanced instrumentation, expertise and training in electron microscopy to enable researchers to solve key problems in science and engineering. Monash University provides on-going funding for the operation of the Centre, including maintenance of multi-million dollar instrumentation and provision of expert staff to train and support researchers using the Centre. This represents a direct contribution to the research project at a cost of at least \$320/hr.'