ELECTRON MICROSCOPE UNIT
ANNUAL REPORT
2012

Permanent Staff

Director	**Prof B.T. Sewell**
Principal Technical Officer (Part Time)	**J. Duncan**
Principal Technical Officer	**M. A. Jaffer**
Principal Scientific Officer	**B.W. Weber**
Chief Scientific Officer	**F. Cummings**
Principal Scientific Officer	**M.E. Waldron**
Technical Assistant	**S. Karriem**

Formal Terms of Reference

The Electron Microscope Unit is an Inter-faculty facility. The following terms of reference were approved by Senate (PC 11/87) and confirmed by GPC (1/2/88).

- The prime objective of the EM Unit is the provision of a dedicated service to the University's research and teaching community.

- The Unit should aim at a high level of maintenance of the instruments, with a minimum of down-time.

- The Unit should ensure the provision of an adequate basic teaching in electron microscopy for users.

The Senate (PC 11/87) also approved the establishment of an EM Unit Steering Committee.

1. General

The Electron Microscope Unit is a resource centre which enables researchers and their students to visualise and analyse microscopic entities arising from diverse fields. The resources it provides are microscopes, preparative equipment, analytical equipment, an infrastructure for image data visualisation, analysis, management and presentation as well as knowledge and experience in a variety of areas of microscopy. The Unit also exists for the promotion of electron microscopy and other forms of microscopic visualisation in research and for the education of users in various aspects of the technology.

A key resource of the Unit are the staff who act as research partners advising on possible microscopy strategies for achieving the required insights and guiding students and researchers in the use of the technology.

The primary areas served are research and postgraduate teaching in Engineering, Health Sciences and Science. The Unit is not structured as a routine diagnostic or quality control facility.

The primary users served by the Unit are from UCT, the neighbouring academic institutions and local industry. Occasional use of the Unit is made by academics from African states and from further afield. Recently the Unit has acquired the status of the National Centre for cryo-Electron Microscopy.

Governance and Management

The operational model for the Electron Microscope Unit

The unit is supported by an annual grant by the University (approx R2.5m) which covers the cost of:

1. A 50% time Director
2. Two full-time principal scientific officers and a principle technical officer (responsible for SEM, TEM and biological sample preparation respectively)
3. A full-time chief scientific officer (responsible TEM/SEM for material science applications)
4. A full time departmental assistant at the highest payclass (responsible for maintenance of the public working areas and to assist technical officers with technical duties as required)
5. A 66% time principal technical officer (responsible for servicing the instruments)

The EMU is located within the Health Sciences for administrative purposes. The budget for the EMU resides within the Health Sciences, but decisions on replacement of equipment, etc. would fall within the ambit of the Steering Committee and CEF.

Income for capital equipment must be raised on the basis of “ad hoc” grants supported by funds raised through services to clients of the EMU.

Income for maintenance, consumables and other running costs, courses, conferences and salary increases must be raised through services to clients.

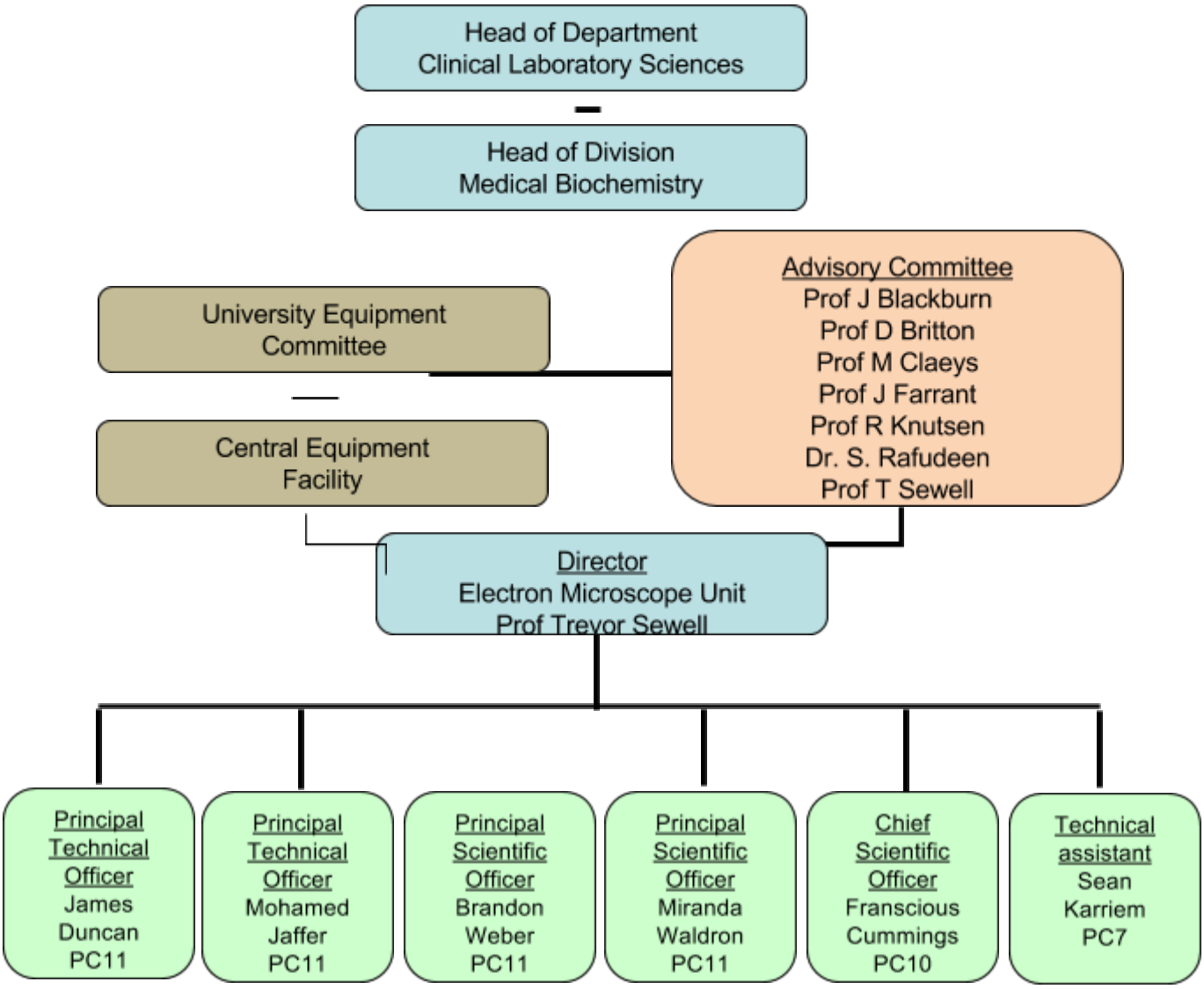
The rates for the use of the instruments assume 500 hours use per instrument per annum. Certain clients receive preferential pricing. Usage is logged by the clients themselves and is billed on a monthly basis. The charge structure should be approved annually through the CEF and UEC

Most clients are students whose usage is funded by their supervisors. The money comes largely from research grants.

Weaknesses in the system

Money is granted to users who then have free choice in how to deploy it. If they choose not to do EM at UCT then no revenue is generated for the maintenance of the instruments. If the Unit does not generate sufficient revenue to maintain an instrument and it fails then no further revenue can be generated and funds must be raised from non-service related income streams in order to restore the instrument. Should the minimum cash required to maintain the instruments not be raised then a catastrophic situation will be unavoidable

Organogram


Head of Department
Clinical Laboratory Sciences
Head of Division
Medical Biochemistry
University Equipment
Committee
Central Equipment
Facility
Advisory Committee
Prof J Blackburn
Prof D Britton
Prof M Claeys
Prof J Farrant
Prof R Knutsen
Dr. S. Rafudeen
Prof T Sewell
Director
Electron Microscope Unit
Prof Trevor Sewell
Principal Technical Officer James Duncan PC11
Principal Technical Officer Mohamed Jaffer PC11
Principal Scientific Officer Brandon Weber PC11
Principal Scientific Officer Miranda Waldron PC11
Chief Scientific Officer Franscious Cummings PC10
Technical assistant Sean Karriem PC7

2. Users

Actual use by hour/ Students name, University or Company, department.

The table below gives a list of people who used the various instruments in the Electron Microscope Unit in 2012. The users are listed by name, University or Company and department and the hours logged by each individual on each electron microscope are noted.

Name	Department or Company	S440 SEM	912 TEM	F20 TEM	T20 TEM	Nova NanoSEM
Cotton, J	180	1				30
Higgins, S	180					18
Dawborn, T	Antofagasta					4.5
Armstrong, A	Archaeology	3				
Bandama, F	Archaeology	6				4
Swan, P	Aswan consult					3
Hedderson, T	Botany					0.5
Welsford, M	Botany	6				
David, J	Cardiovascular	2				
Beja, B	CGI					2
Benton, K	Chem Eng			1		1
Brent	Chem Eng				1	
Chimbganda, T	Chem Eng					3
Egan, T	Chem Eng			2	0.5	
Faiz, O	Chem Eng					1
Feltes, T	Chem Eng			4.5		
Froneman, S	Chem Eng			1	6.5	
Ghorbani, Y	Chem Eng					0.5
Henkel, R	Chem Eng			1.5		
Kekana, L	Chem Eng			4	3.5	
Khan, L	Chem Eng				0.5	
Kubefu M	Chem Eng				1	4.5
Lebohang M	Chem Eng			4	6.5	3
Levecque, P	Chem Eng		1	1	6	2
Lubhelwana, S	Chem Eng				4	
Malatji, P	Chem Eng				5.5	1.5
Mohammed, R	Chem Eng			1.5		1
Moruth, N	Chem Eng					18.5
Moskovitz, K	Chem Eng					3.5
Mwase, J	Chem Eng					0.5
Naidoo, Q	Chem Eng			3	10.5	2.5
Sewsunker, S	Chem Eng				4	
Siyanda L	Chem Eng			1	6.5	
Stracey, R	Chem Eng			1	6.5	1
Susan Tyler	Chem Eng				0.5	
Tereshan G	Chem Eng			1		
Zhou, Y	Chem Eng					2.5
Zonke	Chem Eng				3.5	
Julies, M	Chem Eng			2		1.5
Khasu, L	Chem Eng				0.5	
Gangen, T	Chem Eng				2.5	
Chonco, Z	Chem Eng					1
Norton, S	Chem Invest					4

Ambele, M	Chemistry			9.5	50	
Combrink, J	Chemistry		27	1		
Nassimbeni, L	Chemistry					1
Sagel, S	Chemistry		3.5			
Weber, D	Chemistry					2
Allies, S	CME			57	14.5	18
Bridget	CME	3				2
Clinning, N	CME					6.5
Dineo	CME					0.5
Finkelstien, L	CME			8.5	31	16
George, S	CME				2	1
Hanief, N	CME					37
Irenee	CME			1	2.5	2.5
Khumalo, Z	CME					22
Letaba, G	CME			11.5	68.5	1.5
Livhuani	CME					1.5
Mabunda, Khanyisa	CME			92.5	1	2
Makheta, W	CME					1
Molokwane, Teboho	CME					5
Morrison, G	CME				18.5	
Msumi, C	CME			30	25	
Tapiwa T	CME					8.5
Teboho	CME					20
Thuli	CME					8
Tlangelani	CME					1.5
Tsieane S	CME				3	
van der Meer, P	CME	6.5				22
Fahaad	CPUT				23.5	
Sunday, A	CPUT					1
Durrell	CPUT	3.5				
Mainganye, D	CPUT Chem					3.5
Napan, S	CPUT Chem					2
Ayanda, O.S.	CPUT Civ Eng					3
Greyling, C	CPUT textiles					9
Mufata,	CPUT textiles				4.5	11
Mbanjwa, M	CSIR	6.5				
Mansfield, L	DAFF	8.5				
Jansen, L	DEA					24.5
Eze, P	EBE					1.5
Leiman, A	Economics					1
Varsani, A	EMU		13			
EMU	EMU		2	48	82.5	
Buffler, F	Fine Art					0.5
Muller, B	Frika					1.5
Compton, J	Geol Sci					4
Greyling, L	Geol Sci					1.5
Melosh, B	Geol Sci					18.5
Sherry, T	Geol Sci	19.5				
Makgekgenene, B	Hellenic Geochem					0.5
Aliwaini, S	Human Biol			2		
Wumi	Human Biol					1
Mkentene, K	IIDMM		7.5			
Sriram	IIDMM					4.5
Abbas, Z	IIDMM			3		

Van Zyl, L	IMBM		8.5	2.5	3.5	
Aline	Ithemba					1.5
Balla	Ithemba			2		
Kotsedi, L	Ithemba					1
Mathevula L	Ithemba					3
Topic, M	Ithemba	3.5				
Zebib	Ithemba					12.5
Zeldah	Ithemba					1
Zongo, S	Ithemba					1.5
Rossiter, R	Johnson & johnson					6
Treblanche, T	Johnson & johnson					1.5
Sewell, R	Klawer wines					1
Alrid, L	MCB					2
Alta	MCB		5.5		4	
Brock, T	MCB	1.5	1.5			
Cooper, K	MCB		38.5	11.5		
Everest, G	MCB					3
Glass, J	MCB		2			
Hattingh, A	MCB				3.5	
Marthelize	MCB			3		
Meyers, A	MCB		1.5			
Natherson, A	MCB		28.5			
Pineo, C	MCB		4	4		
Reghard, G	MCB		0.5			
Rybicki, E	MCB		6.5		1	
Kennedy, P	MCB			1		
Du Toit, M	MCB			4.5	2	
Aleyo	MCB		1.5			
Choenyana, G	Mech Eng	4				
Herboth, J-P	Mech Eng	3				
Jacobs, I	Mech Eng	3.5				
Kupswammy, R	Mech Eng					4
Shaba, V	Mech Eng	6.5				
Taifiq T.	Mech Eng	8.5				
S-Grounden, N	Med Biochem			10		
Driver, C	Med Biochem			3.5	5.5	
Offerman, K	Med Virol		1.5			
Phiri, Z	MWU					3
Hattingh, B	NWU				9.5	
Odeh, A	NWU				24	
Okolo, G	NWU				7	
Onwudiwe, D	NWU			3	5.5	
van Rensburg, B	OHE	1				1
Koos, G	OHE Monitoring					1
du Plessis L	Ondesterpoort		7	10.5	38	
Rowan	Origen					1
Petrov, S	Origen	4				0.5
Tshala, O	P&C					1
v.d Walt, M	P&C					1
Wickens, J	P&C					6.5
Zengeni, B	P&C	2				6.5
Brittom, D	Physics				2	
Dejere	Physics					0.5
Jonah, E	Physics					7

Jones, S	Physics			2.5	13.5	3.5
Minani E	Physics				2.5	
Uli	Physics	1				12
Unugibe, D	Physics	1			3	5
van den Berg, C	Physics			1.5	11.5	14
Zambuu, S	Physics					4
Abraham	Poly Sci					0.5
Botha, L	Poly Sci					2.5
Du Toit, M	Poly Sci				18	5
Hadasha, W	Poly Sci			3	4.5	17
Meltz, F	Poly Sci		1	3	10.5	15.5
Neppali, R	Poly Sci			9	7.5	7
Willemse, A	Poly Sci					1.5
Zengeni, E	Poly Sci			2.5	12.5	
Ahmed	Poly Sci				3.5	
Pfukwa, R	Poly Sci				4.5	
Ranesh	Poly Sci				5	
Uys, A	Real world diag			1.5	4	
Bergh, I	Roediger					10.5
Roediger, A	Roediger					4
Mthembu, X	SAB					5.5
Roux, K	SANBI					7
Snjyman, D	SANBI	1				
Mulelu, A	SBIO		60	2		
Patel S	SBIO		1.5			
Hays, M	Sports Sci		28		1	
Kreil, H	Stell Nanofibers					0.5
Halimer. G	TF Design					4
Kotze, K	TF Design					1
Sheku, K	TUT			4	1	
Geesh, N	UFS				2.5	
Luyt, A	UFS			0.5	29	
Remy	Univ Fort Hare					3
Pretorius, C	US Biochem					0.5
Elis, A	US Bot & Zoo	2				2
Lakay, E	US Chemistry				8.5	4
Mphitso, K	US Chemistry			1	11.5	6.5
Neveling, D	US MCB			8		2.5
Steyn, N	US MRC			2		
Erasmus, N	US Physics					
Haupt, K	US Physics			2		
Emjedi, Z	UWC				2	
Tuffin, M	UWC Bio			2.5		
Alegbe, J	UWC Chem			7	0.5	13.5
Banyani, S	UWC Chem					6
Boke, N	UWC Chem					1
Du Plessis, W	UWC Chem					4.5
Gcilitshana, O	UWC Chem					2
Missengue, R	UWC Chem			0.5	7	
Modibane, D	UWC Chem					2
Mukaba, J-L	UWC Chem			0.5	1.5	
Muriithii, G	UWC Chem					3
Muyasa, N	UWC Chem					4
Olivia	UWC Chem					1

Philander, G	UWC Chem					3.5
Su, H	UWC Chem					1.5
Tapiwa H	UWC Chem					12
Ealand, C	WITS			8	6	55.5
Freemantle, C	WITS Mat Eng					5
Amaka	Zoology					1
Lester, N	Zoology	6				

The table below gives a list of UCT users projects,

Students	PI	Project	Technique
Archaeology			
	Armstrong, A	Cut marks on bones from De Kelders Cave dig	SEM
Botany			
	Hedderson, T	*Picobryum*, a new genus of Pottiaceae (Bryophyta) from South Africa, and an erratum for *Acaulonopsis*	SEM
Cardiovascular Research			
Bezuidenhout, D	Bezuidenhout, D	Electro spun vascular grafts	SEM
Chemical Engineering			
Egan, T	Prof A. Lewis	Factors affecting salt purity in eutectic freezer crystallization applied to metallurgical brines	TEM/SEM
Faiz, O	Dr Randall	Sulphate recovery from acid mine & drainage	SEM
Gangen, T, Tyler, S	Prof O Conrad	Preparation of Pt/Pd core shell catalyst	TEM SEM
Ghorbani, Y	Dr Petersen	Characterization of bioleaching in large particle in the heap leach process	SEM
Kekana, L	Prof M Claeys	Synthesis of cobalt nanoparticles from organometallic precursors as model catalyst for Fischer Tropsch	TEM/SEM
Khasu, M	Prof Conrad	Synthesis of water gas shift reaction catalysts	SEM TEM
Kusheel, B	Prof van Steen	Mn-O-Fe interacting for Fe-based Fischer Tropsch	TEM, SEM
Lubhelwana, S	Prof M Claeys	Controlled size synthesis of Co allotropes	TEM
Macheli, L	Prof van Steen	Surface modification of Co with tetraethyl orthosilicate	TEM
Malatse, P	Prof Conrad	Catalysts for steam reforming	TEM
Mungwe, N	Prof. M Claeys	Fischer-Tropsch Synthesis based on Rhodium crystallites and clusters of different sizes.	TEM
Mwase, J		Microbial sulphur Oxidation in Platrest concrete	SEM
Naidoo, S	Prof. A Lewis	Control, of particle characteristics in precipitation process	SEM TEM
Sewsunker, C	Prof Claeys	Synthesis of Rh and Fe model catalysts	SEM TEM
Chemistry			
Ambele, M	Prof T Egan		TEM
Combrink, J			TEM
CME			

Allies, S, Mshumi, C Finkelstein, L,	Prof C Lang	Novel ordering of alloys	TEM/SEM
Clinning, N	Prof Knutsen	The densification of sintered Ti-6Al-4V by hot compression	TEM/SEM
George, S Vilane, V, Morrison, G	Prof Knutsen	EBSD	SEM
Hanief, N	Dr Topic	Phase transformations in the Pt/Cr coated system	SEM
Leteba, G	Prof C Lang	Catalytic properties of pt-based bimetallic catalysts	TEM
Mabunda, K	Dr Lang	Discovering novel Pt structures	TEM/SEM
Makheta, W	Dr Topic	Phase transformations in Pt-based coatings	SEM
Molokwane, T	Prof Knutsen	Quantification of creep damage on aged 12CrMoV121	SEM
Tevera, T	Prof Knutsen	Evaluation of corrosion behaviour on Zinc and Zinc-aluminium coatings	SEM
Tsieane, S	Prof Lang	Synthesis and characterization of Pd nanoparticles	TEM/SEM
Geological Sciences			
Greyling L	Prof Harris	Fluid evolution & characterization of the greenstone belt, cote d'Ivoire	SEM
Melosh, B	Dr Fagereng	Inclusions from the Pofadder shear zone	SEM
Sherry, T	Dr Fagereng	Sole dolomite of the Naukluft Nappe Complex	SEM
Human Biology			
Aliwaini, S	Prof Prince	Identification and characterization of novel chemotherapeutic drugs for breast cancer	TEM
Hay, M	Dr M Collins	The effect of selected genetic polymorphisms on mucoskeletal injury risk and connective tissue ultrastructure	TEM
Molecular and Cell Biology			
Brock, T	Prof Abratt	Clostridium difficile: The epidemiological analysis of South African strains	TEM
K Cooper,	Prof Farrant	Biochemical, genetic, physiological and cellular research in desiccation plants.	SEM, TEM
Glass, J	Dr Hitzeroth	Expression of Rotavirus proteins in plants	TEM
Hattingh, A	Dr Meyer	Creation of plant expressed bluetongue virus	TEM
Natherson, A	Dr Weber	Bioformatic and molecular identification of fimbrial proteins	TEM
Microbiology, US			
Neveling, D	Prof Dicks	Fabrication of a novel bio-electronic sensor	TEM
Mechanical Engineering			
Taifiq, T.	Prof Kuppuswamy	Micro-grinding of PCD insert chamfers with precision depth setting device.	SEM
Choenyana, G	Prof Kuppuswamy	Optimisation of high productivity machining of Ti6Al4V using PCD bull nose end mills	SEM
Herboth, J-P	Prof Kuppuswamy	Machining characterization of nano-amorphous coated micro-engraving tool	SEM
Jacobs, M	Prof Kuppuswamy	Characterization of high productivity machining on Inconel 718 using PCBN bull nose end mills	SEM
Peterov, S	Prof Tait	Fatigue and fracture of PCD	SEM

Shaba, V	Prof Kuppuswamy	Refurbishment of a fire axis tool into a force controlled microgrinder	SEM
Medical Biochemistry			
Driver, C	Prof Parker	Development of a radiolabeled bioconjugate for the treatment of cancer	TEM
Shunmoogam-Gounden, N	Prof D Hendricks	Derivatives of natural products in the treatment of oesophageal cancer	TEM
Medical Virology			
Offerman, K	N Douglass	Characterization of novel avipoxviruses	TEM
Physics			
V.d. Berg, C, Jonah, E, Minani, E, S Jones	Prof D. Britton, Prof M. Harting	Application of Ni-Si semiconductor material.	SEM, TEM,
Unigibe, D	Prof D. Britton, Prof M. Harting	TEM of titanium dioxide nanoparticles produced by flame spray pyrolysis	TEM
Structural Biology			
Broadley, S	Prof B.T.Sewell	Purification and co-crystallisation of Plasmodium falciparum HGXPRT with a chalcone inhibitor	TEM
Thuku, N	Prof B.T.Sewell	Structure of the nitrilase *Rhodococcus rhodochrous* J1: Homology modelling and three-dimensional reconstruction.	TEM
Zoology			
	Cunningham, S	A comparison of billtip organ morphology in kiwi and ibises	SEM
Lester, N	Dr Lucas	Impacts of ocean acidity on South African abalone	SEM

The table below give the top ten users of the Electron Microscope Unit in 2012

Department	Total hrs
Centre for Materials Engineering	552.5
EMU/Structural Biology	196.0
Chemical Engineering	149.0
Polymer Science Stellenbosch	100.5
Molecular and Cell Biology	131.0
Chemistry	124.0
Physics	84.5
UWC-various Departments	122.5
WITS-various Departments	74.5
CPUT-various Departments	61.0

Outputs:
Publications by users of the Unit

Ahmad, E.E.M. Luyt, A.S. 2012. Morphology, Thermal, and Dynamic Mechanical Properties of Poly(lactic acid)/Sisal Whisker Nanocomposites. Polymer Composites 33:1025-1032

Ambele M. A. and Egan T. J. 2012 Neutral lipids associated with haemozoin mediate efficient and rapid beta-haematin formation at physiological pH, temperature and ionic composition. *Malaria Journal* 11:337.

Ayanda, O.S., Fatoki, O, S. Adekola, F.A and Ximba, B.J. 2012 Charaterization of fly ash generated from malts power station in Mpumalanga, South Africa. E-Journal of Chemistry, **9(4):** 1788-1795

Ayanda, O.S., Fatoki, O.S., Adekola, F.A. and Ximba, B.J. 2012. Preparation and characterization of nZnO/fly ash composite. NSTI-Nanotech **1**:95-98

Broadley, S.G., Weber, B.W., Marakalala, M.J., Steenkamp, D.J. and Sewell, B.T. 1012. A new crystal form of MshB from *Mycobacerium tuberculosis* with glycerol and acetate in the active site suggests the catalytic mechanism. Acta Cryst **68**: 1450-1459

Fatoki, O.S., Ayanda, O.S., Adekola, F.A., Ximba, B.J. and Opeolu, B.O. 2012. Preparation and characterization of activated carbon – nFe_3O_4, activated carbon – $nSiO_2$ and activated carbon – nZnO hybrid materials. Part. Part. Syst. Charact. **29:**178-191

George S.L. and Knutsen R.D. 2012 Composition segregation in semi-solid metal cast AA7075 aluminium alloy, Journal of Materials Science **11**:4716–4725

Ghorbani, Y.,Petersen J., Harrison S.T.L.,Tupikina O.V.,Becker,M., Mainza,A.N. and Franzidis J-P. 2012. An experimental study of the long-term

bioleaching of large sphalerite ore particles in a circulating fluid fixed-bed reactor. Minerals Engineering, **35**: 46-48.

Jones, G. C.; van Hille R. P. and Harrison S. T. L. 2012. Reactive oxygen species generated in the presence of fine pyrite particles and its implication in thermophilic mineral bioleaching. http://dx.doi.org/10.1007/s00253-012-4116-y

Manole, V. Laurinmaki, P, Van Wyngaart, W, Potgieter, C.A., Wright, I.M., Venter, G.J., van Dijk, A.A., Sewell, B.T. and Butcher, S.J. 2012. Structural insight in African Horsesickness virus infection. J Virol **15**:7858-7866

Mokone T.P., Lewis A.E., and van Hille, R.P. 2012. Effect of post-precipitation conditions on surface properties of colloidal metal sulphide precipitates. Hydrometallurgy **111-120**: 55-66

Mwase J. M; Petersen J; and Eksteen J. J. 2012. Assessing a two-stage heap leaching process for Platreef flotation concentrate. Hydrometallurgy Volumes **129–130**:74–8.

Neveling; D.P.Endo; A Dicks L.M. 2012. Fructophilic Lactobacillus kunkeei and Lactobacillus brevis isolated from fresh flowers, bees and bee-hives Current Microbiology;65(5):507-515.

Oluwaseun O.O.; Harrison S T. L.; van Hille R P.2012. Effect of culture conditions on the competition between lactate oxidisers and fermenters in a biological sulfate reduction system. Bioresource Technology, **104**:616-621

Ramoshibidu P. M, Fischer, N., Claeys, M. and van Steen, E. 2012. Strong-metal–support interaction by molecular design: Fe–silicate interactions in Fischer–Tropsch catalysts. Journal of Catalysis. **289**:140–150

Su, H. Bladergroen, B.J. Pasupathi, S, Linkov, V and Ji, S. 2012. Performance Investigation on Membrane electrode assemblies for hydrogen production by solid polymer electrolyte water electrolysis. Int J Electrochem **7:** 4223-4234

Sone, B.T., Benoit, R., Zongo, S., Bucher R. and Maaza, M. 2012. Time based investigation of the growth of VO_2 (*B*) micro- and nanostructures on vanadium by hydrothermal synthesis. Materials Chemistry and Physics 1-13

Twalaa B. V., Sewell B. T., Jordaan,J. 2012. Immobilisation and characterisation of biocatalytic co-factor recycling enzymes, glucose dehydrogenase and NADH oxidase, on aldehyde functional ReSyn™ polymer microspheres. Enzyme and Microbial Technology, **50**, Issues 6–7:331–336

Students graduating in 2012 who have used the Unit in the course of their studies:

Name	Degree	University	Department	Race	Gender
Amod, Mohammed	MSc	UCT	Chemical Engineering	C	M
Chimbganda, Tapiwa	MSc	UCT	Chemical Engineering	B	M
Faber, Carly	MSc	UCT	Geology	W	F
Ghorbani, Yusuf	PhD	UCT	Chemical Engineering	C	M
Godogwana, Zimboneni	PhD	UWC	Chemistry	M	B
Johnstone-Robertson, Madelyn	PhD	UCT	Chemical Engineering	W	F
Khumalo, Zakhelumuxi	MSc	UCT	Physics	B	M
Makhubela, Banothile	PhD	UCT	Chemical Engineering	B	F
Malatji, Peter	PhD	UCT	Chemistry	B	M
McKormick, Darryn	MSc	UCT	Mechanical Engineering	W	M
Monjane, Aderito	PhD	UCT	Microbiology	B	M
Musil, Emily	MSc	UCT	Chemical Engineering	W	F
Musyoka, Muleli	MSc	UWC	Chemistry	B	M
Nagooroo, Sancha	MSc	UCT	Chemical Engineering	C	F
Reddy, Amelia	PhD	UCT	Microbiology	C	F
Royker, Mariam	MSc	UCT	Chemical Engineering	W	F
van Heerden ,Tracey	MSc	UCT	Chemical Engineering	W	F
Viglietti, Pia	MSc	UCT	Geology	W	F
Wright, Claire	MSc	UCT	Chemical Engineering	W	F

Finances:

2012	Operating 000516	Services 001258	Equipment 170025	Consumables 000933	Maintenance 000995
Opening Balance	-11,066	3,326,069	5,798	48,951	802,035
Income	58,991	961,762		43,959	427,431
Expenditure	-47,923	-3,302,985	-4,665	-50,799	-831,978
Closing balance	2	984,846	1,133	42,111	397,488
Income					
Grant Transfers					
Operating Grant	58,991				
Budget allocation					
Internal recoveries				24,297	422,181
External recoveries		437,392			
Refund Insurance claim		524,400			
Sales revenue				19,662	5,250
Total	**58,991**	**961,792**		**43,959**	**427,431**
Expenditure					
Tel, Postage, Fax	45,615	10,896		6,663	5,495
PC Consumables		6,442			1231
PC components					862
Fund Transfer					
Stationery		929			466
Travel		25,411		3,440	16,259
Conferences		1,140			
Building repairs and maintenance		178			
Utilities		3,392		33,222	15,084
General Operating	4,208	57,320	3,166	7,633	55,002
Repair and Maintenance	208	13,120			330,187
Equipment	2,100				
Assets		3,128,599	1,499		200,887
Entertainment & Functions		3,058			423
Utilities rental					56,920
Staffing costs and bursaries		52,500			148,875
Petty Cash	-4,208			-159	
books					287
Total	**47,923**	**3,302,985**	**4,665**	**50,799**	**831,978**