



**UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA**

Faculty of Natural and Agricultural Sciences

Department of Physics
Institute of Applied Materials
SARChI Chair in Carbon Technology & Materials
Building: Natural Science 1 (Room 4-19)

Equipment: WITec alpha300R confocal Raman microscopy (high-resolution confocal Raman imaging, AFM and SNOM)

Head of equipment: Prof N Manyala

USER FORM

SURNAME	
INITIALS	
TITLE	
FIRST NAME	
GENDER	
RACE	
NATIONALITY	
ID OR PASSPORT NUMBER	
HIGHEST QUALIFICATION	
DEPARTMENT	
INSTITUTION	
CONTACT NUMBER	
EMAIL	

Current Date (DD/MM/YYYY):.....

PLEASE NOTE: A user need to only complete one user form – regardless of the number of measurements. Additional user forms need to only be completed if there is a change in user details.



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TERMS OF USE

1. There is a charge for the use of operators and equipment. An estimate of the costs will be presented after a booking has been received.
2. All bookings for analytical work must be accompanied by
 - A summarised description of the materials to be analysed and the expected scientific outcomes;
 - The number of specimens (as well as the number of samplings per specimen);
 - Suggestions on sample preparations (not compulsory; typically no sample preparation is required).
 - Any health and hazard risks for the specimen material should be clearly stated, including copies of available MSDS documents.
3. Each booking must be accompanied by a signed copy of the terms of use.
4. All students (MSc and PhD) bookings must be given approval by their supervisor.
5. The full name of the equipment must be acknowledged in the experimental section in all publications emanating from results obtained from this equipment. The relevant format for acknowledging this equipment in any publication/thesis/dissertation containing data that was generated, processed or interpreted can be obtained from the equipment staff before being submitted for publication.
6. Due to the nature of the expertise and time involved in data acquisition and processing for high-resolution Raman, AFM and SNOM imaging, an extra cost is required for using this specialized technique. Users of the equipment for the imaging aspect of data analysis need to either accept the extra cost in addition to the basic operating cost or commit to co-authorship of any publication where equipment staff (operator and head of equipment) assisted in generating, processing and interpreting data. In the case of a student thesis/dissertation, full acknowledgment for the work done must be mentioned.
7. Intellectual property (IP) sensitive research is to be governed by an appropriate confidentiality agreement between relevant parties.
8. Once data has been transferred to users, the equipment staff members reserve the right to remove the data from its operating database after a period of 3 – 6 months without notice.

We the undersigned accept the terms and conditions stated above.

Name of the user (researcher):Signature:.....Date:.....

Name of supervisor:.....Signature:.....Date:.....
(where applicable)

PLEASE NOTE: A user need to only complete this form once – regardless of the number of measurements.



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RATES IN RANDS – February 2018

ANALYSIS	INTERNAL (Departments at UP)	EXTERNAL (Other universities)	INDUSTRY
Raman spectra / sample	250 (no charge for physics dept.)	375	500
Raman imaging / sample (*per imaging)	500	750	1000
AFM imaging / sample (*per imaging)	500	750	1000
Force spectroscopy analysis (AFM imaging in contact mode) / sample (*per imaging)	500	750	1000
Raman + AFM imaging / sample (*per imaging)	1000	1500	2000
SNOM imaging / sample (*per imaging)	1500	2250	3000
N.B: SNOM combine Raman and AFM			
Nanolithography / sample	500	750	1000

PLEASE NOTE: Due to the nature of the expertise and time involved in data acquisition for high-resolution Raman, AFM and SNOM imaging, the total cost is charged per sample. An extra cost is required, i.e. 14% of the total cost above, for data processing. Users of the equipment for the aspect of data processing and analysis need to either accept the extra cost or commit to collaboration.

WITec alpha300 RAS+ system, Confocal Raman Microscope with Integrated Atomic Force Microscopy (AFM), Scanning Near-field Optical Microscopy (SNOM), and nanolithography has some of the following capabilities:

- Raman Spectroscopy Measurements.
- High Resolution and Ultrafast Raman Imaging to reveal the distribution of chemical compounds/composition.
 - Confocal Raman Imaging Depth profile (for transparent samples), 2D Imaging (non-transparent samples) with a lateral resolution of 360 nm and depth resolution of 530 nm (100x/0.9 objective).
- High-Resolution AFM imaging: Contact Mode, Lateral-Force Mode (force-distance curves measurements), and AC (Tapping) Mode.
- Optical imaging beyond the diffraction limit: Scanning Near-Field Optical Microscopy (SNOM) gives an optical resolution in the range of 50-100 nm, higher than normal confocal optical microscopy where resolution is limited by diffraction. SNOM allows the optical detection of minuscule surface structures of transparent as well as opaque samples and typical applications are found in fields of nano-photonics and nano-optics.
- Nanolithography using AFM tip and laser scribing for patterning.
- The design of the WITec alpha300R confocal Raman microscopy (Raman, AFM, and SNOM) allows analysis of the same spot of the sample for a more comprehensive sample analysis. Switching between the different modes is simply done by rotating the microscope turret without moving the sample. Generally, the system has a capability of detecting a few micromolar of molecules and is reported to have unprecedented precision and sensitivity. The Raman imaging can be carried out over a larger area or entire substrate by image-stitching of high-resolution images using a piezo-scanner which is very fast and extremely accurate.