**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.

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**

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| **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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