

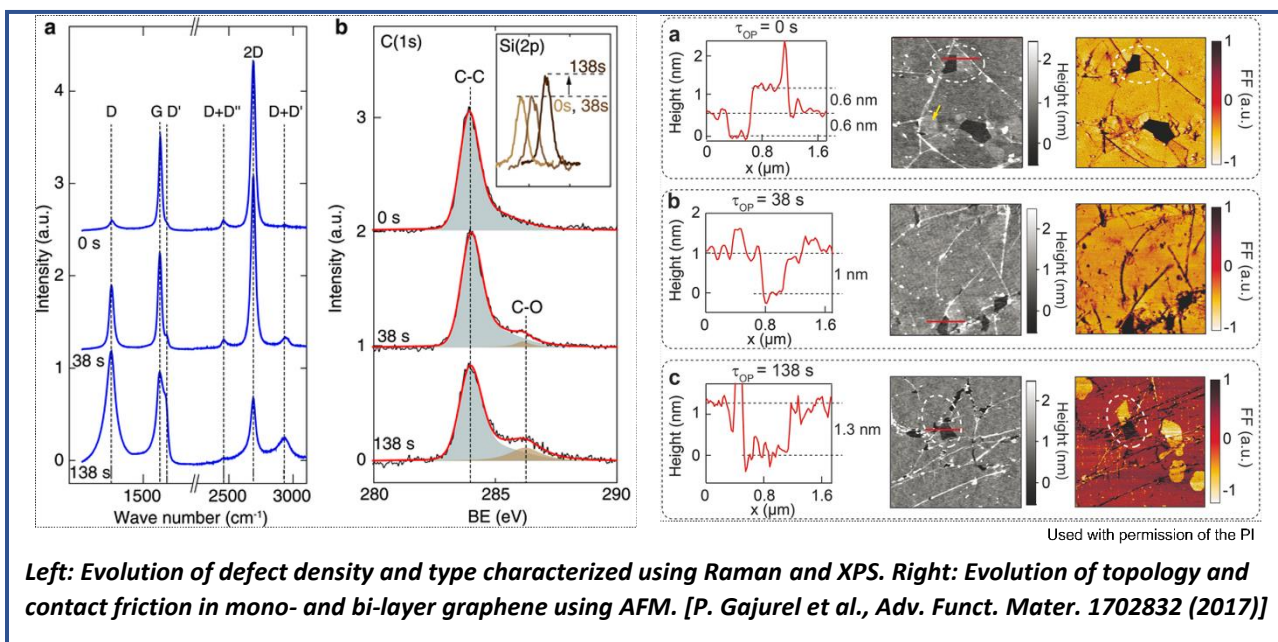
# MATERIAL CHARACTERIZATION FACILITIES (MCF)

<https://sharedresearchfacilities.wvu.edu/facilities/materials-characterization>



## OVERVIEW

The Materials Characterization Facilities (MCF) offers instruments to investigate the structural, chemical, electrical, and optical properties of materials. Our facilities include a PANalytical X'Pert Pro XRD and a Bruker D8 Discovery XRD for Crystal structure determination and quantitative phase-mixture analysis, a Physical Electronics PHI 5000 VersaProbe X-ray photoemission spectrometer (XPS) for surface chemistry analysis. Moreover, our Digilab FTS 7000 FTIR spectrometer and Renishaw InVia Raman microscope aid in phase/functional group identification and chemical compositions analysis. We also house a J.A. Woollam M-2000U Ellipsometer for precise measurements of film thickness and optical constants, and a pair of atomic force microscopes to provide 3D surface topography with sub-nanometer resolution.



**Left: Evolution of defect density and type characterized using Raman and XPS. Right: Evolution of topology and contact friction in mono- and bi-layer graphene using AFM. [P. Gajurel et al., Adv. Funct. Mater. 1702832 (2017)]**

## REPRESENTATIVE EQUIPMENT

- PANalytical X'Pert Pro X-ray diffractometer
- PHI 5000 VersaProbe XPS
- Renishaw InVia Raman Microscope
- Asylum MFP-3D AFM
- Bruker D8 Discovery X-ray diffractometer
- Digilab FTS 7000 FTIR System
- J.A. Woollam M-2000U Ellipsometer
- Nanoscope MultiMode AFM

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