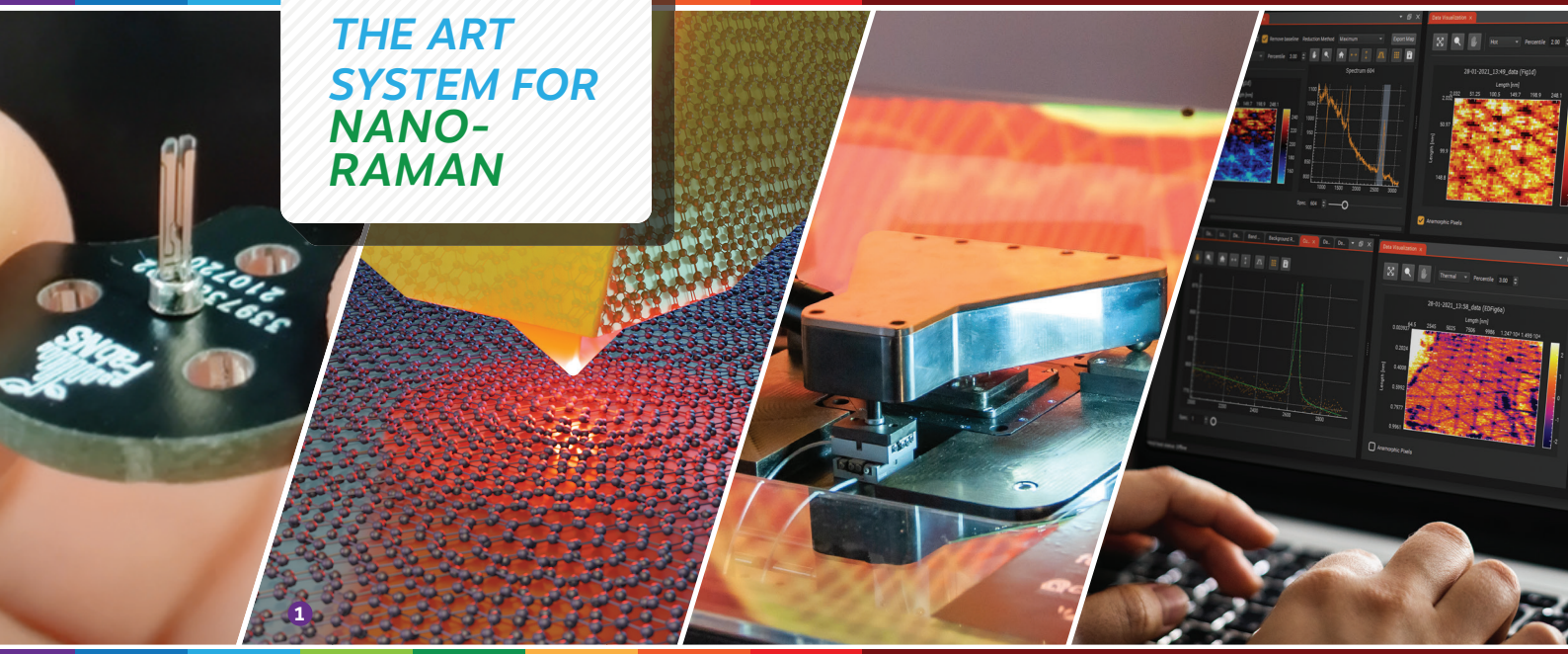
FabNS

www.fabns.com.br

# PORTO®
## STATE OF THE ART SYSTEM FOR NANO-RAMAN



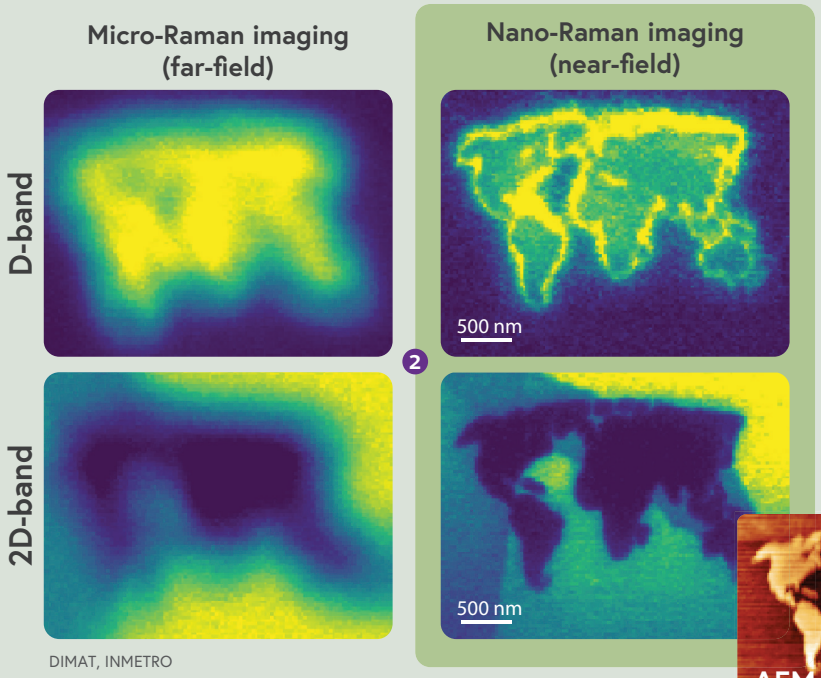
## PORTO TERS SYSTEM

Combining optical spectroscopy, which provides physical & chemical information, with a scanning probe microscope, which provides topographical information plus sample manipulation, the **PORTO TERS** system is able to characterize materials in the micro and nano regimes, all in situ.

## PROVIDED TECHNIQUES

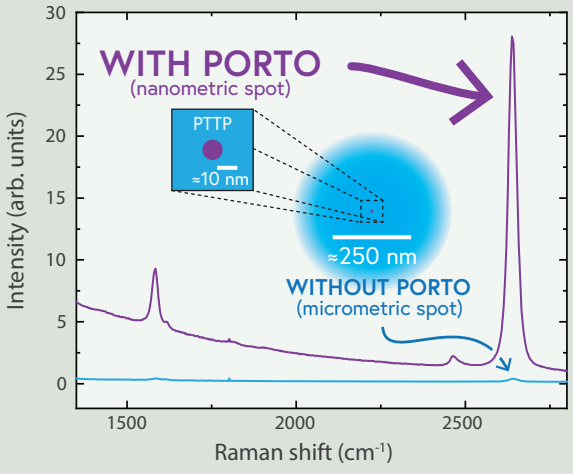
- TERS
  *Tip-Enhanced Raman Spectroscopy*
- Confocal Raman Spectroscopy
- AFM (Atomic Force Microscope)
- STM (Scanning Tunneling Microscope)
  *(soon)*

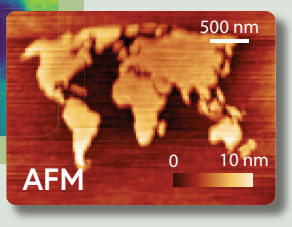
## **HYPERSPECTRAL IMAGING** FROM A GRAPHENE SAMPLE WITH DEFECTS PATTERNED BY HELIUM ION MICROSCOPY




DIMAT, INMETRO

## **WITH** vs. **WITHOUT** THE PRESENCE OF OUR NANO-ANTENNA[3]





1. Nature 590, 405–409 (2021)
2. Details: IEEE J. Sel. Top. Quantum Electron. 1–1 (2021)
3. Phys. Stat. Sol. – Rapid Res. Lett. 2000212 (2020)

FabNS

www.fabns.com.br

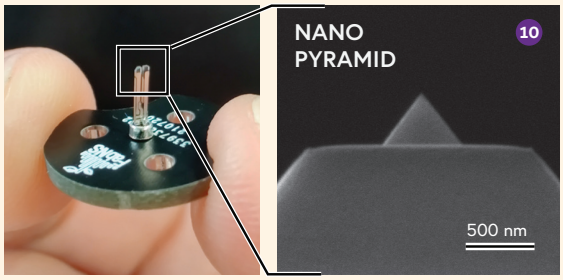
# PORTO APPLICATIONS

Experimental exploration of Moiré patterns in twisted bilayer graphene[1]; inflammatory processes in brain tissues induced by amyloid plaques[2]; PN junctions in graphene and $MoS_2$[3]; doping characterization, mechanical deformations[4] and the impact of the substrate in bidimensional materials[5]; plasmonic properties of nanostructures[6]; nanometrology[7]; phonon coherence length in GaS[8].


1. Nature 590, 405–409 (2021)
2. Analyst 146, 6014–6025 (2021)
3. J. Phys. Chem. Lett. 12, 7625–7631 (2021)
4. ACS Appl. Nano Mater. 4, 1858–1866 (2021)
5. Phys. Rev. Research, 2, 023408 (2020)
6. Phys. Status Solidi RRL, 14, 2000212 (2020)
7. Phys. Rev. Applied, 14, 024056 (2020)
8. Nano Lett. 2019, 19, 10, 7357–7364 (2019)

## HARDWARE

- System based on an inverted microscope to achieve **ideal stability and efficiency**;
- **AFM:** non-contact shear-force operation;
- Both **probe and sample scanning** options;
- **Fully motorized** system with full remote operation;
- **Exclusive PTTP probes for TERS**[9]: unprecedented optical signal enhancement and spatial resolution (10nm in ambient conditions);
- Signal acquisition in **free space** for better performance; optical **fiber coupling** option, for increased flexibility;
- **Ultra-fast** hyperspectral detection (EMCCD technology);
- **Simultaneous** acquisition of optical and AFM data;
- **Open-optics concept**: user-accessible excitation and collection paths for maximum customization;
- Easy, fast, and efficient **probe replacement system** with magnetic coupling.




9. J. Chem. Phys. 153, 114201 (2020)
10. Adv. Opt. Mater. 6, 1800528 (2018)

## DATA ANALYSIS SOFTWARE

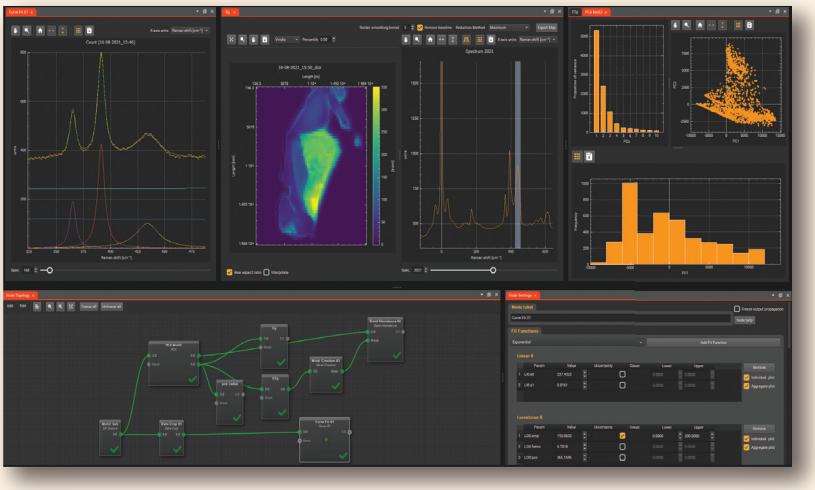
### PortoPilot

- **Innovative** and **friendly** control software;
- **Realtime hyperspectral image** processing on the fly;
- **Acquisition history:** automatically stores all measurements and associated parameters;

### PortoFlow

#### Data analysis software

- **Novel node-based paradigm**, enabling fully customizable, interactive, and non-destructive analysis, including **PCA** and ***spectral unmixing***;
- **Efficient curve fitting system:** developed for performance, it is capable of fitting complex data through thousands of spectra simultaneously.



ABOUT FabNS

*FabNS is a startup company that develops and manufactures scientific-grade instruments and provides specialized software and services.*

**FabNS Instruments**
Rua Professor José Vieira de Mendonça, 770
Bairro Engenho Nogueira, Belo Horizonte, MG, Brazil - CEP 31.310-260
**www.fabns.com.br • nano@fabns.com.br**