# PeakForce Tapping

10 YEARS

How AFM Should Be

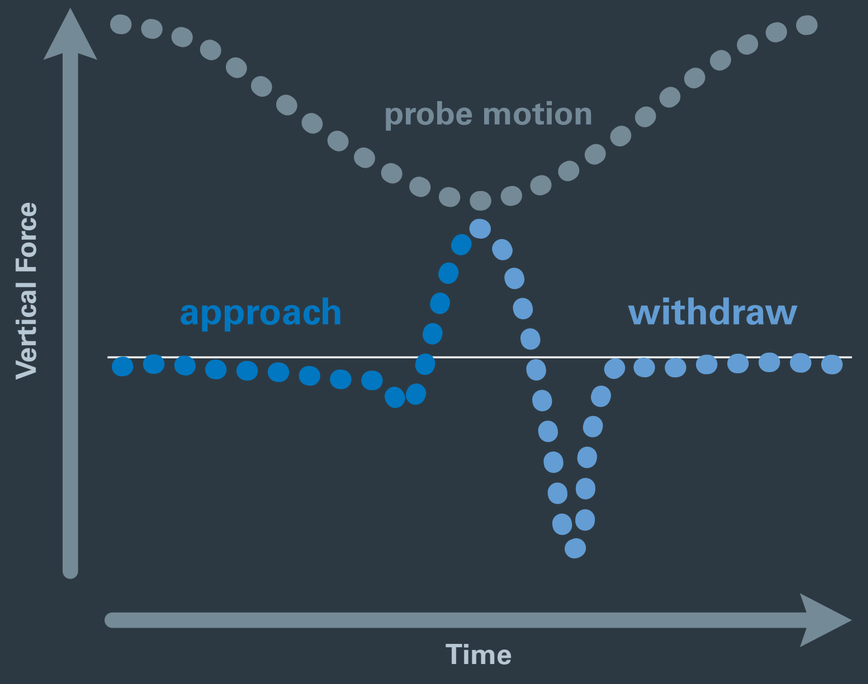
BRUKER

## History

- **2009** — PeakForce QNM ScanAsyst
- **2010** — PeakForce TUNA; U.S. Patent 7,658,097
- **2011** — U.S. Patent 8,650,660
- **2012** — PeakForce KPFM
- **2013** — PeakForce Capture
- **2014** — U.S. Patent 8,739,309; U.S. Patent 8,646,109
- **2015** — PeakForce QNM-LC
- **2016** — PeakForce sMIM; PeakForce SECM
- **2017** — PeakForce QNM-HA
- **2018**
- **2019**

PeakForce Tapping has been the most significant scientific breakthrough in atomic force microscope (AFM) technology since the introduction of TappingMode.

## Innovation




In PeakForce Tapping, the probe periodically taps the sample and the pN-level interaction force is measured directly by the deflection of the cantilever. A real feedback loop (not force trigger) keeps the peak force down to 10 pN at actuation rates up to 8 kHz, in air and fluid.

PeakForce Tapping is ideal for both materials research and biological samples due to its unprecedented low imaging forces and ease of use. No cantilever tuning is necessary. The superior force control maintains tip and sample integrity, leading to consistently accurate and high-resolution measurements of even the smallest structures, from atomic defects to double helix DNA.

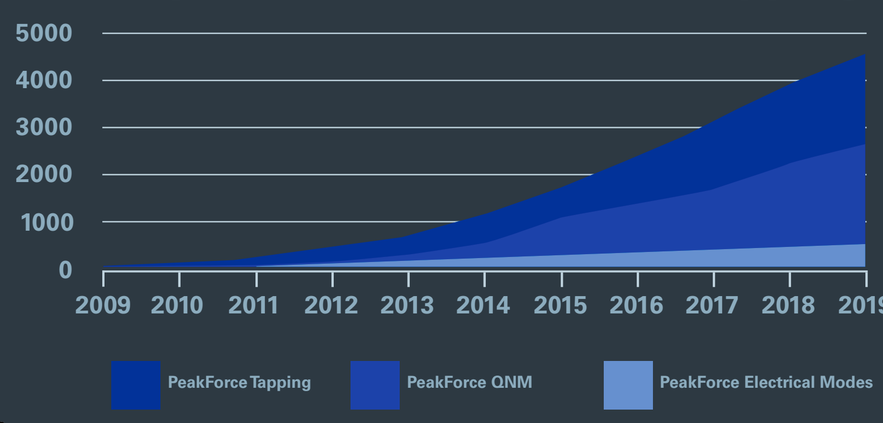
## Capabilities

| APPLICATIONS | ScanAsyst | PeakForce QNM | PeakForce Capture | PeakForce TUNA | PeakForce KPFM | PeakForce SECM | Invent Your Own |
|---|---|---|---|---|---|---|---|
| 2D materials/perovskites characterization | ■ | ■ | | ■ | ■ | | PeakForce PFM |
| Composite materials nanomechanics | ■ | ■ | ■ | ■ | ■ | | PeakForce Contact Res |
| Energy/devices materials research | ■ | ■ | | ■ | | ■ | |
| In situ lithium ion battery studies | ■ | | | | ■ | ■ | |
| Other energy research | ■ | | | ■ | | ■ | |
| Local electrochemistry/ conductivity in liquid | ■ | ■ | | | | | |
| Molecular bio-imaging | ■ | ■ | ■ | | | | |
| In situ live- and fixed-cell imaging | ■ | ■ | ■ | ■ | ■ | | |
| Semiconductor device characterization/FA | ■ | ■ | | | ■ | | PeakForce SCM; PeakForce SSRM |
| Industrial defect analysis | ■ | ■ | | | | | |
| Roughness/deep trench measurements | ■ | | | | | | |

PeakForce Tapping technology enables and enhances other correlative and quantitative mapping techniques, providing new mechanical, electrical, and chemical information on previously inaccessible samples.

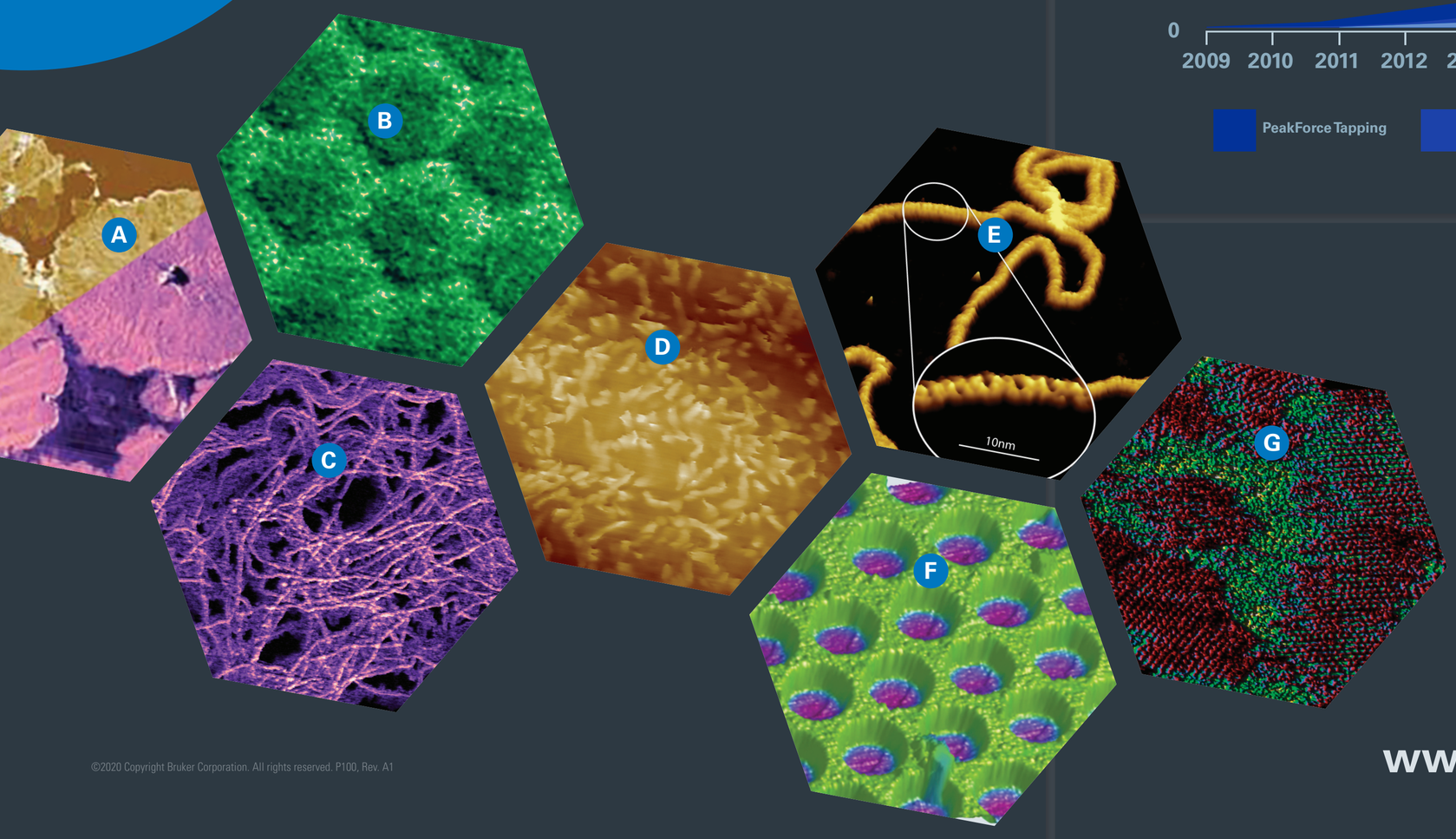
## Success

### Adoption Rate of PeakForce Tapping




The adoption rate of PeakForce Tapping has surpassed even that of TappingMode, resulting in more than one article every day for over 10 years!

## What Will You Discover?




A Correlated electrical and mechanical mapping in battery cathode
(P. De Wolf, Bruker Nano Surfaces)

B Nanoscale strain distribution in graphene on boron nitride
(C. Woods, Univ. of Manchester, doi.org/10.1038/nphys2954)

C Measuring conductivity of individual P3HT nanowires
(P. Leclère et. al., Univ. of Mons, Belgium)

D Individual microvilli on living MDCK cells
(H. Schillers, Univ. of Münster, Germany, doi.org/10.1002/jmr.2510)

E DNA double helix structure major and minor grooves
(B. Hoogenboom/A. Pyne, Univ. College London, doi.org/10.1002/smll.201400265)

F 3D topography of a nanomesh electrode (Au-SiO2) covered by EC current skin
(C. Stelling/M. Retsch, Univ. of Bayreuth)

G Sub-molecular adhesion on iPMMA
(T. Thurn-Albrecht, Martin-Luther-Univ. Halle-Wittenberg)

**www.Bruker.com/PeakForce-Tapping**

# Poster Guide for Printing at FEDEX Office

## STEPS

**FEDEX provides both in-store and on-line services for Poster printing.**
(Note: Online printing is usually a better value and the following steps will be a condensed guide).

- FEDEX Office Printing Services
- https://www.fedex.com/apps/ondemand/print-online
- Upload a Print-Ready File
- Select **Posters/ Poster Prints** category
- Drag and Drop files onto this page; or click on BROWSE FILES to navigate to the saved poster pdf file on your device/computer.
- **My Projects**
- Select Print file from list; click on **SET UP PROJECT**
- Select **Print Properties menu** (Figure 1)

1. PRODUCT TYPE: Poster Print
2. SIZE: 24 inches (60.96 cm) x 36 inches (91.44 cm)

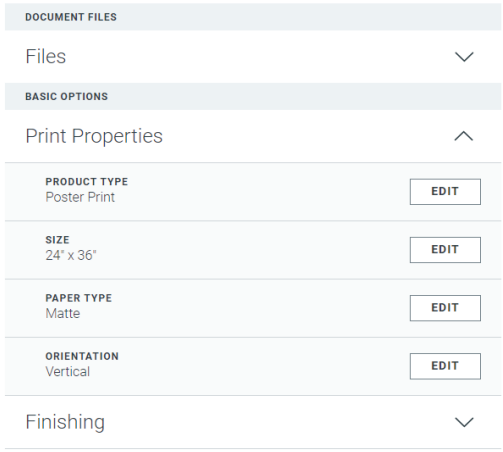
- Select **Finishing** (Optional) (Figure 2)

GROMMETS: None

1. MOUNTING: Gatorboard
2. LAMINATION: Matte

Allow for shipping time and/or location for delivery or pickup with FEDEX for your particular needs.

### Figure 1




### Figure 2