HORIBA Scientific

Raman Microscopy for Beginners

- Reference: RAM1
- Duration: 3 days
- Dates: February 11-13, 2019
  May 13-15, 2019
  June 24-26, 2019
  October 7-9, 2019
  November 18-20, 2019
- Who should attend
  Users of HORIBA Scientific Raman spectrometers
- From Monday 9 am to Wednesday 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on Raman spectrometers
- Learn how to use the software
- Learn methodology for method development and major analytical parameters
- How to set up an analytical strategy with an unknown sample
- How to interpret results
- Learn how to follow the performances of the Raman spectrometer over the time.

Can be followed by DuoScan, Particle Finder, TERS & ULF trainings

Program

Day 1

- The theory of the Raman principle
- Raman Instrumentation
- Practical session – System and software presentation, Acquisition Parameters:
  - LabSpec 6 presentation and environment: user accounts, file handling, display of data, basic functions
  - Set up of acquisition parameters and single spectra measurement
  - Templates & Reports

Day 2

- Analysis of Raman spectra
- Practical session: Raman spectrum measurement and Database Search
  - Optimization of the parameters: how to chose the laser, the grating, the confocal hole, the laser power
  - How to use the polarization options
  - Library Search using KnowItAll software
  - How to create databases

Raman imaging

- How to make a Raman image (1D, 2D and 3D)
- Data evaluation: cursors, CLS fitting, peak fitting
- Image rendering, 3D datasets
- Fast mapping using SWIFT XS

Day 3

Data processing

- Processing on single spectra and datasets
- Baseline correction
- Smoothing
- Normalization
- Spectra subtraction, averaging
- Data reduction
- Methods
- Practical exercises

Customer samples: Bring your own samples!

For further information, contact:
Tel: + 33 (0) 1 69 74 72 00, Fax: + 33 (0) 1 69 09 07 21, training.hfr@horiba.com

Raman Options: DuoScan, Ultra Low Frequency, Particle Finder, TERS

- Duration: 1 day
- Dates: February 14 or 15, 2019
  May 16 or 17, 2019
  October 10 or 11, 2019
- From 9:00 am to 5:30 pm

- Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

Objectives

Acquire technical skills on DuoScan, Ultra Low Frequency (ULF), Particle Finder or TERS.

Program

- Reference: RAM1DS

Introduction to DuoScan
- Principle and hardware

DuoScan Macrospot
- Practical examples

DuoScan MacroMapping
- Practical examples

DuoScan Stepping Mode
- Practical examples

Customer samples: Bring your own samples!

- Reference: RAM1ULF

Presentation of the ULF kit
- Principle and requirements
- Application examples

Installation of the ULF kit

- Reference: RAM1PF

Introduction to Particle Finder
- Principle and requirements

Practical session
- Demo with known sample
- Customer samples: Bring your own samples!

Practical session
- Demo with known samples

Customers samples: Bring your own samples!

- Reference: RAM1TERS

Presentation of the TERS technique
- Principle and requirements
- Application examples

Demo TERS
- Presentation of the different tips and SPM modes
- Laser alignment on the tip
- TERS spectra and TERS imaging on known samples

Practical session
- Hands-on on demo samples (AFM mode)
- Laser alignment on the tip
- TERS spectra and TERS imaging on known samples

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Raman SERS

- Reference: RAM2
- Duration: 1 day
- Dates: February 14, 2019
  June 27, 2019
  November 21, 2019

- Who should attend

  Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and labSpec Software. It is adviced to participate in the basic Raman training first.

- From 9 am to 5:30 pm

Objectives

- Acquire theoretical and practical knowledge on SERS (Surface Enhanced Raman Spectroscopy)
- Know how to select your substrate
- Interpret results

Program

Introduction to SERS

Presentation of the SERS technique

- Introduction: Why SERS?
- What is SERS?
- Surface Enhanced Raman basics
- SERS substrates

Introduction to the SERS applications

- Examples of SERS applications
- Practical advice
- SERS limits

Demo on known samples

Customer samples: Bring your own samples!

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Raman Multivariate Analysis

- Reference: RAM3
- Duration: 1 day
- Dates: February 15, 2019
  June 28, 2019
  November 22, 2019

- Who should attend

  Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

- From 9 am to 5:30 pm

Objectives

- Understand the Multivariate Analysis module
- Learn how to use Multivariate Analysis for data treatment
- Perform real case examples of data analysis on demo and customer data

Program

Introduction to Multivariate Analysis
- Univariate vs. Multivariate analysis
- Introduction to the main algorithms: decomposition (PCA and MCR), classification and quantification (PLS)

Practical work on known datasets (mapping)
- CLS, PCA, MCR

Introduction to classification
- HCA, k-means
- Demo with known datasets

Introduction to Solo+MIA
- Presentation of Solo+MIA
- Demo with known datasets

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AFM-Raman

- Reference: RAM4
- Duration: 3 days
- Dates: February 11-13, 2019
  May 13-15, 2019
  November 18-20, 2019
- Who should attend
  Scientists, engineers, technicians, Ph.D. students who have already acquired good skills in Raman spectroscopy or SPM.
- From 9 am to 5:30 pm

Objectives

- Acquire practical knowledge on Raman spectroscopy and Scanning probe microscopy
- Learn how to use dedicated Raman and AFM software
- Learn the methodology to perform TERS measurements (alignment, macros, procedures)

Program

Day 1

Raman spectroscopy
- Principle and advantages of Raman spectroscopy
- Instrumentation

Practical session
- Optimization of the parameters: How to choose the laser, the grating, the confocal hole, the laser power
- How to make a Raman image (2D)
- Data evaluation: cursors, CLS fitting, peak fitting
- Fast mapping using SWIFT XS

Objective: Being able to select the good parameters for Raman imaging and to perform data process

Scanning Probe Microscopy (SPM)
- Instrumentation
- The different modes (AFM, STM, Tuning Fork) and signals (Topography, Phase, KPFM, C-AFM, MFM, PFM)

Practical session
- Tips and sample installation
- Molecular resolution in AFM tapping mode
- Measurements in AC mode, contact mode, I-top mode, KPFM
- Presentation of the dedicated tips and additional equipment
- Objective: Being able to use the main AFM modes and optimize the parameters

Day 2

Tip Enhanced Raman Spectroscopy
- Principle and requirements
- Presentation of the different TERS tips (STM-TERS Au, AFM-TERS Au and AFM-TERS Ag)
- Excitation laser alignment on the TERS tip (rough and fine alignment)
- TERS demonstration on carbon nanotubes and graphene oxide flakes
- Optimization of the TERS parameters (spectra and imaging)

Practical session
- Hands-on on demo samples (AFM mode)
- Laser alignment on the tip
- TERS spectra and TERS imaging on known sample

Day 3

TERS Hands-on
- TERS measurements, from AFM-TERS tip installation to TERS mapping.
- TERS measurements on end users samples.

- **Bring your own samples!**

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Practical information

Courses range from basic to advanced levels and are taught by application experts. The theoretical sessions aim to provide a thorough background in the basic principles and techniques. The practical sessions are directed at giving you hands-on experience and instructions concerning the use of your instrument, data analysis and software. We encourage users to raise any issues specific to their application. At the end of each course a certificate of participation is awarded.

Standard, customized and on-site training courses are available in France, Germany, USA and also at your location.

Dates mentionned here are only available for HORIBA France training center.

Registration

Fill in the form and:

- Email it to: training.hfr@horiba.com
- Or Fax it to: +33 (0)1 69 09 07 21
- More information: Tel: +33 (0)1 69 74 72 00

General Information

The invoice is sent at the end of the training.
A certificate of participation is also given at the end of the training.
We can help you book hotel accommodations.
Following your registration, you will receive a package including training details and course venue map. We will help with invitation letters for visas, but HORIBA FRANCE is not responsible for any visa refusal.

Pricing

Refreshments, lunches during training and handbook are included.
Hotel transportation, accommodation and evening meals are not included.

Location

Depending on the technique, there are three locations: Longjumeau (France, 20 km from Paris), Palaiseau (France, 26 km from Paris), Villeneuve d'Ascq (France 220 km from Paris) or at your facility for on-site training courses. Training courses can also take place in subsidiaries in Germany or in the USA.

Access to HORIBA FRANCE, Longjumeau

HORIBA FRANCE SAS
16 - 18 rue du canal
91165 Longjumeau - FRANCE

Depending on your means of transport, some useful information:
- if you are arriving by car, we are situated near the highways A6 and A10 and the main road N20
- if you are arriving by plane or train, you can take the train RER B or RER C that will take you not far from our offices. (Around 15 €, 150 € by taxi from Charles de Gaulle airport, 50 € from Orly airport).

We remain at your disposal for any information to access to your training place. You can also have a look at our web site at the following link:

http://www.horiba.com/scientific/contact-us/france/visitors-guide/

Access to HORIBA FRANCE, Palaiseau

HORIBA FRANCE SAS
Passage Jobin Yvon, Avenue de la Vauve,
91120 Palaiseau - FRANCE

From Roissy Charles de Gaulle Airport By Train

- Take the train called RER B (direction Saint Remy Les Chevreuse) and stop at Massy-Palaiseau station
- At Massy-Palaiseau station, take the Bus 91-06 C or 91-10 and stop at Fresnel
- The company is a 5 minute walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building

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Around 150 € by taxi from Charles de Gaulle airport.

From Orly Airport By Train

- At Orly airport, take the ORLYVAL, which is a metro line that links the Orly airport to the Antony RER station
- At Antony station, take the RER B (direction St Remy Les Chevreuse) and stops at Massy-Palaiseau station
- At Massy-Palaiseau station, take the Bus 91-06 C, 91-06 B or 91-10 stop at Fresnel
- The company is 5 minutes walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building
- Or at Orly take the Bus 91-10 stop at Fresnel. The company is 5 minutes walk from the station, on your left, turn around the traffic circle and you will see the HORIBA building. We remain at your disposal for any information to access to your training place. You can also have a look at our web site at the following link:

http://www.horiba.com/scientific/contact-us/france/visitors-guide/

Around 50 € by taxi from Orly airport.

Access to HORIBA FRANCE, Villeneuve d'Ascq

HORIBA Jobin Yvon SAS
231 rue de Lille,
59650 Villeneuve d'Ascq - FRANCE

By Road from Paris

When entering Lille, after the exit «Aéroport de Lequin», take the direction «Bruxelles, Gand, Roubaix». Immmediatly take the direction «Gand / Roubaix» (N227) and No «Bruxelles» (A27) Nor «Valenciennes» (A23).

You will then arrive on the ringroad around Villeneuve d'Ascq. Take the third exit «Pont de Bois».

At the traffic light turn right and follow the road around, (the road will bend left then right). About 20m further on you will see the company on the right hand side where you can enter the car park.

By Road from Belgium (GAND - GENT)

Once in France, follow the motorway towards Lille. After «Tourcoing / Marcq-en-Baroeul», follow on the right hand side for Villeneuve d'Ascq. Take the exit «Flers Chateau» (This is marked exit 6 and later exit 5 - but it is the same exit). (You will now be following a road parallel to the motorway) Stay in the middle lane and go past two sets of traffic lights; at the third set of lighte, move into the left hand lane to turn under the motorway.

At the traffic lights under the motorway go straight, (the road shall bend left then right). About 20 m further you shall see the company on the right hand side where you can enter the car park.

Aeroplane

From the airport Charles de Gaulle take the direction 'Terminal 2' which is also marked TGV (high speed train); where you can take the train to 'Lille Europe'.

Train - SNCF

There are two train stations in Lille - Lille Europe or Lille Flandres. Once you have arrived at the station in Lille you can take a taxi for HORIBA Jobin Yvon S.A.S., or you can take the underground. Please note both train stations have stations for the underground.

Follow the signs:
1. From the station «Lille Flandres», take line 1, direction «4 Cantons» and get off at the station «Pont de bois».
2. From the station «Lille Europe», take line 2, direction «St Philibert» and get off at the following station «Gare Lille Flandres» then take line 1, direction «4 Cantons» and get off at the station «Pont de Bois».

Bus

Bus n°43, direction «Hôtel de Ville de Villeneuve d'Ascq», arrêt «Baudoin IX».

HORIBA Scientific

Registration form

Training course:..... Date: .....

Family Name:..... First Name:.....

Company/Organisation:.....

Address:.....

Telephone Number:..... Fax:

Email:.....

Purchase order number:.....

Invitation letter requested: Yes No

If yes: Hotel accommodation:.....

Passport number:..... Date of arrival:.....

Date of passport validity:..... Date of departure:.....

Date of birth:..... Additional hotel dates (if requested in Paris):

Place of issue (as mentioned on the passport):..... .....

Date & signature

Stamp of the company

Information

Registration: Fill inthe form and send it back by FAX or Email four weeks before beginning of the training.

Registration fees: the registration fees include the training courses and documentation. Hotel, transportation and living expenses are not included except lunches which are taken in the HORIBA Scientific Restaurant during the training.

Your contact: HORIBA FRANCE SAS, 16-18 rue du Canal, 91165 Longjumeau, FRANCE Tel: + 33 1 64 74 72 00

Fax: + 33 1 69 09 07 21

E-Mail: training.hfr@horiba.com

Siret Number: 837 150 366 00024

HORIBA Scientific continues contributing to the preservation of the global environment through analysis and measuring technology

Certified ISO 14001 in 2009, HORIBA Scientific is engaged in the monitoring of the environmental impact of its activities during the development, manufacture, sales, installation and service of scientific instruments and optical components. Training courses include safety and environmental precautions for the use of the instruments

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