

# NANOinBIO 2022 Spring School

May 30	
08.15 am	Welcome Reception & Registration
Spring School : Machine learning approaches for data analyses	
9.30 am – 12.30 pm	<p><b>Lead: Prof Adam Foster, Aalto University</b></p> <p><b>Aim:</b> Theoretical introduction to machine learning for data analysis. Basic keys for getting started as a non-specialist. Worked examples.</p> <p><b>Program:</b></p> <ul style="list-style-type: none"><li>• Introduction<ul style="list-style-type: none"><li>○ Python, Jupyter notebooks, GitHub</li></ul></li><li>• Tutorials<ul style="list-style-type: none"><li>○ Reading data - parsing files</li><li>○ Image processing in Jupyter e.g. FFT</li><li>○ <i>Advanced</i> - "OpenCV tutorial" - images and movies</li></ul></li></ul>
12.30 pm	Lunch Break
2.00 pm – 5.30 pm	<p><b>Lead: Prof Adam Foster, Aalto University</b></p> <p><b>Aim:</b> Choice of a suitable strategy for a given question, and main steps to enact a given strategy. Guided 'hands on' approach to extracting a given feature from a real data set. Hints from experience and discussion of possible variations</p> <p><b>Program:</b></p> <ul style="list-style-type: none"><li>• Introduction<ul style="list-style-type: none"><li>○ Machine learning (CNN), reinforcement learning, when and why?</li></ul></li><li>• Tutorials<ul style="list-style-type: none"><li>○ Sci-kit learning classification on images</li><li>○ CNN Good tip vs. bad AFM tip</li><li>○ <i>Advanced</i> - Deep reinforcement learning toy model (linked to AFM autonomous operation)</li></ul></li></ul>

## NANOinBIO 2022 Spring School

May 31	
09.00 am - 09.15 am	Welcome & Registration
Spring School : Machine learning approaches for data analyses	
9.30 am - 12.30 am	<p><b>Lead: Prof Nuria Gavara, University of Barcelona</b></p> <p><b>Aim:</b> Focus on Atomic Force Microscopy: extracting quantitative information from datasets. Worked example from topographic images to mechanical data.</p> <p><b>Program:</b></p> <ul style="list-style-type: none"> <li>• Calibrations</li> <li>• Mechanical models</li> <li>• Data fitting and feature extraction</li> <li>• Looking at data distribution and outliers</li> </ul>
12.30 pm	Lunch Break
2.00 pm - 4.00 pm	<p><b>Lead: Prof Nuria Gavara, University of Barcelona</b></p> <p><b>Aim:</b> Worked example highlighting the 'dos' and 'don't' when implementing and a machine learning approach. Machine learning for disease diagnostic</p> <p><b>Program:</b></p> <ul style="list-style-type: none"> <li>• Classification versus regression, supervised vs unsupervised learning, training vs test datasets</li> <li>• Assessing "success", ROC, statistical descriptors and the issue of generalization</li> <li>• Supervised machine learning algorithms (kNN, SVM, Random Forest, Decision Trees)</li> <li>• Feature selection vs dimensionality reduction</li> </ul>
4.15 pm	Group photos at the University "Campus of Fouillole"

Major Public Conference at  
University of the French West Indies

04.30 pm

Opening Ceremony

Keynote Lecturer : Dr. Philippe Lavalle (INSERM, Strasbourg)

Moderator : Dr. Etienne Dague (LAAS, Toulouse)

5.00 pm

The poster features a dark background with glowing blue wireframe models of various bacteria. On the left, an orange box contains the text 'Conférence Grand public'. On the right, a blue box contains the date and time: 'Mardi 31 mai 2022 16h30 à 19h Université des Antilles'. Below these boxes, the main title is written in white: 'Infections à l'hôpital : les biomatériaux innovants pour limiter les maladies nosocomiales ?'.

Topic : Smart materials for preventing nosocomial infections

07.30 pm

Conference Dinner

# NANOinBIO 2022 Conference

<b>June 01</b>	
08.15 am – 08.45 am	<b>Welcome Reception &amp; Registration</b>
<b>Conference Session I Scanning probe microscopy &amp; force spectroscopy</b>	
09.00 am – 09.30 am	<b>Loredana Casalis, Synchrotron of Trieste, Italia (Keynote lecture)</b>
09.30 am – 9.45 am	<b>Pedro de Pablo, Universidad Autonoma de Madrid, Madrid, Spain</b>
9.45 am – 10.00 am	<b>Sébastien Lyonnais, CEMIPAI, Montpellier University, France</b>
10.00 am – 10.20 am	<b>Massimiliano Berardi, Optics11 life, Amsterdam, NL</b>
10.20 am – 10.50 am	<b>Coffee Break (30 min)</b>
10.50 am – 11.15 am	<b>Yoo Jin Oh, Johannes Kepler University, Linz, Austria (Invited)</b>
11.15 am – 11.30 am	<b>Maria Ines Villalba, EPFL, Lausanne, Switzerland</b>
11.30 am – 11.45 am	<b>Sofiane El-Kirat-Chatel, Université de Lorraine, Villers les Nancy, France</b>
11.45 am – 12.00 pm	<b>Cécile Formosa-Dague, Université de Toulouse, France</b>
12.00 pm – 12.20 pm	<b>Christian Bippes, Nanosurf AG, Liestal, Switzerland</b>
12.30 pm – 02.00 pm	<b>Conference Lunch</b>
<b>Conference Session II Optical microscopies &amp; spectroscopies</b>	
02.00 pm – 02.30 pm	<b>Jörg Enderlein, University of Göttingen, Germany (Keynote lecture)</b>
02.30 pm – 02.45 pm	<b>Luca Piantanida, Boise State University, USA</b>
02.45 pm – 03.00 pm	<b>Axel Gansmüller, Université de Lorraine, Vandoeuvre-les-Nancy, France</b>
03.00 pm – 03.15 pm	<b>Lucie Haye, Université de Strasbourg, France</b>
03.15 pm – 03.30 pm	<b>Sophie Lecomte, University of Bordeaux, France</b>
03.30 pm – 04.00 pm	<b>Coffee Break (30 min)</b>
04.00 pm – 04.15 pm	<b>Hendrik Vondracek, Elettra Sincrotrone Trieste, Italy</b>
04.15 pm – 04.30 pm	<b>Kamila Lepicka, Polish Academy of Sciences, Warsaw, Poland</b>
04.30 pm – 04.45 pm	<b>Jérémie Mathurin, Université Paris-Saclay, Orsay, France</b>
04.45 pm – 05.00 pm	<b>Aurélie Delumeau, Université des Antilles, France</b>
07.30 pm	<b>Conference Dinner</b>

<b>June 02</b>	
<b>Conference Session III</b> <b>Latest advances in materials application &amp; life sciences</b>	
08.40 am – 09.10 am	<b>Catherine Picart, University of Grenoble, France (Keynote lecture)</b>
09.10 am – 9.25 am	<b>Eloise Lebaudy, Centre de Recherche en Biomédecine de Strasbourg, France</b>
9.25 am – 9.40 am	<b>Jenny Harnett, University of Edinburgh, UK</b>
9.40 am – 9.55 am	<b>Yulia Sergeeva, Faculty of Health and Society, Malmö, Sweden</b>
9.55 am – 10.10 am	<b>Giovanna Fragneto, Institut Laue-Langevin, Grenoble, France</b>
10.10 am – 10.40 am	<b>Coffee Break (30 min)</b>
10.40 am – 11.10 am	<b>Patrick Couvreur, Insitut Galien – Université Paris-Saclay, France (Keynote lecture)</b>
11.10 am – 11.25 am	<b>Miriam Colombo, University of Milano, Italy</b>
11.25 am – 11.40 am	<b>Antoine Combes, Université de Strasbourg, France</b>
11.40 am – 11.55 am	<b>Christelle Yacou, Université des Antilles, Pointe-à-Pitre, France</b>
11.55 am – 12.20 pm	<b>Paolo Scrimin, University of Padova, Italy (Invited)</b>
12.30 pm – 02.00 pm	<b>Conference Lunch</b>
<b>Conference Session IV</b> <b>Simulations and machine learning</b>	
02.00 pm – 02.30 pm	<b>Adam Foster, Aalto University, Finland (Keynote lecture)</b>
02.30 pm – 02.45 pm	<b>Magdalena Giergiel, Jagiellonian University, Krakow, Poland</b>
02.45 pm – 03.00 pm	<b>Saeid Ekrami, Université de Lorraine, Nancy, France</b>
03.00 pm – 03.25 pm	<b>Sergei Kalinin, Oak Ridge National Laboratory, United States (Invited)</b>
03.25 pm – 04.00 pm	<b>Coffee Break</b>
04.00 pm – 04.30 pm	<b>Teuta Pilizota, University of Edinburgh, United Kingdom (Keynote lecture)</b>
04.30 pm – 04.45 pm	<b>Adrian Martinez-Rivas, Instituto Politécnico National, Mexico City, Mexico</b>
04.45 pm – 05.00 pm	<b>Yashasvi Ranawat, Aalto University, Finland</b>
05.00 pm – 06.00 pm	<b>Poster Session I – Networking Time</b>
07.30 pm	<b>Conference Dinner</b>

<b>June 03</b>		
<b>Conference Session V</b>		
<b>Scanning probe microscopy &amp; force spectroscopy</b>		
08.40 am – 09.10 am	<b>Georg Fantner, EPFL, Lausanne, Switzerland (Keynote lecture)</b>	
09.10 am – 9.25 am	Xinyu Zhang, ETH Zurich, Switzerland	
9.25 am – 9.40 am	William Trewby, Durham University, UK	
9.40 am – 9.55 am	Samuel Leitao, EPFL, Lausanne, Switzerland	
9.55 am – 10.10 am	Bastian Hartmann, Munich University of Applied Sciences, Munich, Germany	
10.10 am – 10.25 am	Peter Hinterdorfer, Johannes Kepler University Linz, Austria	
10.30 am – 11.00 am	<b>Coffee Break (30 min)</b>	
11.00 am – 11.30 am	<b>Nuria Gavara, Institute for Bioengineering of Catalonia, Spain (Keynote lecture)</b>	
11.30 am – 11.45 am	Javier Lopez, Institut Pasteur de Lille, France	
11.45 am – 12.00 pm	Ophélie Thomas-Chemin, LAAS-CNRS, Toulouse, France	
12.00 pm – 12.20 pm	Alexander Dulebo, JPK BioAFM, Bruker Nano Surfaces, Berlin, Germany	
12.20 am – 12.35 pm	Andreas Rohtaschek, TU Wien, Austria	
12.40 pm – 02.00 pm	<b>Conference Lunch</b>	
<b>Conference Session VI</b>		
<b>Latest advances in materials application &amp; life sciences</b>		
02.00 pm – 02.30 pm	<b>Nicholas Kotov, University of Michigan, United States (Keynote lecture)</b>	
02.30 pm – 02.45 pm	Ronald Zirbs, University of Natural Resources and Life Sciences, Vienna, Austria	
02.45 pm – 03.00 pm	Cédric Vranckx, Université catholique de Louvain, Belgium	
03.00 pm – 03.15 pm	Laura Martinez-Vidal, Università Vita-Salute San Raffaele, Milan, Italy	
03.15 pm – 03.40 pm	<b>Michel Gingras, University of Waterloo, Canada (Invited)</b>	
03.40 pm – 04.00 pm	<b>Coffee Break</b>	
04.00 pm – 06.00 pm	<b>Poster Session II – Networking Time</b>	<b>International Cooperation workshop</b>

**June 03**

**Gala Diner**

**Caribbean Music & Dance Show**

07.30 pm



Traditional musics and dances with the famous Guadeloupe Carnival atmosphere by Double Face

**NANOinBio Awards**

**Conference & Group photos**

**June 04**

**Social Event**

**Mangrove tour by glass bottom boat**

**07.30 am – 05.00 pm**



One-day mini ecological cruise type excursion (with meal) in a glass bottom boat, with flippers, mask and snorkel. Supervised by a diving instructor and a biologist guide. Discovery of the mangrove, lagoon and coral reef. The excursion includes the visit of mangroves, Birds Island and Rousseau islet, exploration of the coral reef (diving equipment provided) or swimming. Meals on the beach at Pointe Sables.

**07.30 pm**

**Conference Dinner**



**June 05****Conference Session VII  
Special NanoInBio session**

<b>08.40 am – 09.10 am</b>	<b>Hermann Schillers, University of Münster, Germany (Keynote lecture)</b>
<b>09.10 am – 09.25 am</b>	<b>Guillaume Berthout, Anton Paar France, Les Ulis, France</b>
<b>09.25 am – 09.40 am</b>	<b>Davide Prospero, University of Milano-Bicocca, Milano, Italy</b>
<b>09.40 am – 09.55 am</b>	<b>Halima Alem, Université de Lorraine, France</b>
<b>09.55 am – 10.10 am</b>	<b>Luisa Fiandra, University of Milano-Bicocca, Milano, Italy</b>
<b>10.10 am – 10.25 am</b>	<b>Marie Dubus, Université de Reims Champagne Ardenne, France</b>
<b>10.30 am – 11.00 am</b>	<b>Coffee Break (30 min)</b>
<b>11.00 am – 11.30 am</b>	<b>Laïla Pasquina-Lemonche, University of Sheffield, UK (Keynote lecture)</b>
<b>11.30 am – 11.45 am</b>	<b>Kislon Voitchovsky, Durham University, UK</b>
<b>11.45 am – 12.00 pm</b>	<b>Fabienne Quiles, Lorraine University, Villers-les-Nancy (France)</b>
<b>12.00 pm – 12.15 pm</b>	<b>Marc Ropitiaux, Normandie Université, Rouen, France</b>
<b>12.15 pm – 12.30 pm</b>	<b>Hélène Martin-Yken, Toulouse Biotechnology Institute, Toulouse, France</b>
<b>12.30 pm – 02.00 pm</b>	<b>Concluding remarks &amp; Conference Lunch</b>