



SPPIN - Saints Pères Paris Institute for the Neurosciences, CNRS UMR 8003

Université Paris Cité, Faculté de Sciences

Campus Saint Germain, 45 Rue des Saints Pères, Paris 75006.

 *Metro 4 Saint Germain*

# NANOSCALE 2022

Organisers -

Martin OHEIM, SPPIN, CNRS, Université de Paris, Paris, France

Adi SALOMON, Dept. of Chemistry & BINA Nanocenter, Bar-Ilan University, Ramat-Gan, Israel

April 6-8, 2022 Université de Paris, 6th arrondissement de Paris, France



## NANOSCALE2022

THE CONTEXT. After more than 20 years of nano-sciences and -technology and nano-devices being present in almost every part of science, and even our day-life, **a reliable measurement of nanometric distances along the optical axis of a microscope, a spectrometer or other optical devices is still missing.**

The EU-funded NANOSCALE project (<https://nanoscale.sppin.fr>), a French-Israeli collaboration between SPPIN and BINA aims at filling this gap. Based on a patented nanometric sandwich, NANOSCALE has provided a unique multi-layered calibration slide for surface fluorescence, together with a dedicated software analysis tool. The nano-patterned slide features thin layers of non-fluorescent spacer, fluorescent and a non-fluorescent capping layer, all with the refractive index close to that of a living cell. It permits, for non-professional user, a calibration of fluorescence in terms of axial distance, a key requirement for quantitative near-surface optical imaging, spectroscopy and sensing.

OBJECTIVES. The NANOSCALE2022 symposium will provide an update on the current state of research, **bring together a vibrant community of academics and industry and trigger future collaborations and innovations. It also aims at opening the community and inciting follow-up grant applications, potentially in new geometries.**

Through multiple thematic sessions, we will explore the bases, current state and applications of surface fluorescence and related techniques and we will outreach to communities not yet targeted, including pharmacology/toxicology, environmental science, as well as the national and European instituts of standards.

THE VENUE. The workshop will take place on the premises of **Université Paris Cité (UP)** in the 6th arrondissement of Paris. UP is the second-biggest French research university founded in 2020 through the fusion of Paris Descartes University, Paris Diderot University and the Institut du Globe.

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*Wednesday and Friday : ILLUMENS Salle Ambroise Paré (ex-école de chirurgie), 6<sup>th</sup> floor*

*Thursday : Salle des Theses 3<sup>rd</sup> floor*

<https://www.sppin.fr/contacts/>

<https://nanoscale2022.sciencesconf.org/resource/page/id/3>

CONTACT. [nanoscale@sppin.fr](mailto:nanoscale@sppin.fr)

Tel: +33 1 76 53 43 41 (Aude Bombay)

**Wednesday 6 April 2022**

*ILLUMENS, ex-école de médecine, 6<sup>th</sup> floor*

18h00 - 18h45

Buffet

18:45- 20:30

**Session I**

Introduction to NANOSCALE

**Eitan Reuveny**

Novel ion-channel interaction revealed by proximity-ligation assay and fluorescence-resonance energy transfer

**Christopher Yip**

Probing the solid-liquid interface by SAF microscopy:  
Applications to the study of surface adsorption dynamics

**Marc Guillon**

Digital optical phase conjugation through thick scattering tissues with a wavefront sensor

**Kaitlin Szederkenyi**

Developing a confocal total internal reflection-supercritical angle fluorescence geometry with sample scanning

**Thursday 7 April 2022**

Salle des Theses 3<sup>rd</sup> floor

9h00 -

Gathering at Café "Le Comptoir des Saints Pères"

29 rue des Saints Pères, (Junction with rue Jacob, 50m from the university)

9 :30 - 11 :15

**Session 2**

**Keynote: Frédérique de Fornel**

Evanescent waves and near-field microscopies

**Carine Julien**

Quantitative surface fluorescence microscopy: a flexible TIRF-SAF microscope for combined sample- and Fourier-plane imaging

**Christophe Zimmer**

TBA

**Mohamad Hamode**

Metallic nanostructure for pharmaceutical optical sensing and for calibration of optical microscopies

**11 :15 - 13 :15**

**Poster sessions + lunch**

13 :00- 14h30

**Session 3**

**Ariel Levenson**

Gathering multiple disciplinary skills to tackle nano-characterization and nano-metrology challenges: the C'Nano and Club NanoMetrology initiatives

**Rodolphe Jaffiol**

Quantification of single-cell adhesion by variable-angle TIRF imaging

**Dror Fixler**

Biological logic-gates actualization by examining the effects of gold nanoparticle-fluorophore conjugates on the fluorescence lifetime.

**Hodaya Klimovsky**

Characterising thin-film polymer layers with far-field light

14h30 - 14h45

**Coffee**

14h45 - 16h00

#### **Session 4**

**Yitzhak Mastai**

Chiral nanofilms of metal oxides by molecular-layer deposition

**Adi Salomon** 3D Metallic networks - optical properties and applications

**Ilya Olevsko**

Color coding of axial fluorophore distance

**Gerardo Byk**

New Biocompatible Nanoparticles: multistep chemical modifications and biological applications

16h00-16h30

**Coffee** + white boards

16h30 - 17h30

#### **Session 5**

**Brieuc Chauvin**

*In vitro* study of the diffusion barriers established by septins with single particle tracking

**Martin Oheim**

Combined TIR-excitation and SAF detection: why and what for

**Gerhard Schütz**

Following T cell antigen recognition molecule by molecule

17h30-19h00

INTERNAL NANOSCALE team meeting

**Friday 8 April 2022**

*ILLUMENS, ex-école de médecine, 6<sup>th</sup> floor*

9h30

Coffee + croissants on the terrasse

10h00-12h00

**Session 5- surface biology**

Nicolas Demaurex

Molecular and structural determinants of calcium signalling at endoplasmic reticulum-plasma membrane contact sites

Thierry Galli

Molecular and cellular mechanisms of unconventional secretion

Andreas H. Guse

Calcium microdomains in T cells

Student prize awards

12h00-12h30

Coffee + white boards, farewell

12h30-14h30

for PIs: in small committee (grants, applications,

collaborations with people who want to stay): drinks + food



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Physik Instrumente, Karlsruhe, Germany

your coffee breaks come from:



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