

2021

organized by
LABEX Σ -LIM



TECH DAYS

EXPLORE THE WORLD OF BIOMATERIALS
WITH ADVANCED PHOTONICS
AND ARTIFICIAL INTELLIGENCE

October 05-07 2021

Limoges

www.unilim.fr/sigmatech-days



Σ-TECH DAYS

2021

The third edition of the Σ-Tech Days autumn school will cover the theme “**Explore the world of biomaterials with advanced photonics and artificial intelligence**”. The lecture series will be held from **5th to 7th October 2021** at Limoges, France.

The Σ-Tech Days school is supported by the LABEX Σ-LIM. The event is intended to gather international experts and provide a snapshot of the academic landscape on a targeted research area. It is also expected to be a forum for the confrontation of ideas and the emergence of new ones.

This year, the scientific program of the school is organized around three topics:

→ **Biomaterials, development and biological properties**

This topic includes:

- Development of ceramic devices for applications in bone tissue engineering
- Advanced manufacturing technologies and characterization techniques
- Control of chemical and architectural design
- Study of cell-materials interactions
- Biocompatibility, biofunctionalization, biomimetics, biofabrication

→ **Optical microscopy and spectroscopy**

This topic includes:

- Development of photonic instrumentation for life sciences
- Advanced strategies of microscopy and/or spectroscopy
- Linear and nonlinear processes
- Coherent Raman microscopy, super-resolution microscopy
- Label-free imaging, live cell/tissue imaging

→ **Data analysis and artificial intelligence**

This topic includes:

- Processing and analysis of spectral data
- Chemometrics
- Classification and decision making
- Deep learning
- Real or artificial intelligence

AGENDA

	Tuesday Oct. 5 th	Wednesday Oct. 6 th	Thursday Oct. 7 th
09 - 10 am	09 - 10 am Welcome & opening speech by Thierry Chartier (Director of LABEX Σ -Lim, IRCER, CNRS, University of Limoges, France)	09 - 10 am Engineering of living tissue exploiting innovative biomaterials and processes by Rainer Detsch (University of Erlangen-Nuremberg, Germany)	09 - 10 am Biointerfaces or how living objects interact with materials? by Karine Anselme (IS2M, CNRS, UHA Mulhouse, France)
10 - 10.30 am	10 - 10.30 am Coffee break & networking	10 - 10.30 am Coffee break & networking	10 - 10.30 am Coffee break & networking
10.30 - 11.30 am	10.30 - 11.30 am Calcium phosphates: from biominerals to biomaterials by Christophe Drouet (CIRIMAT, CNRS, University of Toulouse, France)	10.30 - 11.30 am A glimpse of neuronal structures by Philippe Carré and Thierry Urruty (XLIM, CNRS, University of Limoges, France)	10.30 - 11.30 am Chemometrics in the framework of spectroscopic imaging by Ludovic Duponchel (LASIR, CNRS, University of Lille, France)
11.30 am - 12.30 pm	11.30 am - 12.30 pm Visualizing living cells without staining and labeling: nonlinear Raman spectroscopic approach to life sciences by Hideaki Kano (Kyushu University, Japan)	11.30 am - 12.30 pm Nanoscale imaging of (live) biological tissues by super-resolution localization microscopy by Laurent Cognet (LP2N, CNRS, University of Bordeaux, France)	11.30 am - 12.30 pm Applications of biomaterials in surgery by Joël Brie (University Hospital of Limoges, France)
12.30 - 02 pm	12.30 - 1.45 pm Lunch	12.30 - 02 pm Lunch	12.30 - 02 pm Lunch
02 - 03 pm	1.45 - 02 pm Artificial intelligence analysis of multimodal NMR data for binary glioma grade discrimination by Paul Dequidt (XLIM, CNRS, University of Poitiers, France)	02 - 03 pm Linear and nonlinear optical spectroscopy techniques in (bio)materials by Vincent Rodriguez (ISM, CNRS, University of Bordeaux, France)	02 - 03 pm Is the brain a good model for artificial intelligence? by Frédéric Alexandre (Inria Bordeaux, France)
03 - 04 pm	02 - 03 pm Artificial intelligence and medical imaging by Mathieu Naudin (University Hospital of Poitiers, LabCOM I3M, France)	03 - 04 pm Coffee break, networking & poster session	03 - 04 pm Perspectives of the LABEX Σ -Lim & closing speech by Thierry Chartier, Eric Champion & Philippe Leproux (LABEX Σ -Lim, CNRS, University of Limoges, France)
04 - 05 pm	03 - 05 pm Coffee break, networking & poster session	04 - 06 pm Lab tour XLIM Company tour	04 - 06 pm Lab tour IRCER Company tour
05 - 07.30 pm	05 - 07.30 pm Social event: cultural event, city of Limoges		

- Biomaterials, development and biological properties
- Optical microscopy and spectroscopy
- Data analysis and artificial intelligence

LABEX Σ-LIM

AT A GLANCE

The LABEX Σ-LIM “From specific ceramic materials and components to integrated, secured and smart communicating systems” is a joint operational structure between IRCER and XLIM, two mixed research units of the University of Limoges and the CNRS. It is supported by two competitiveness clusters, the European Ceramics Cluster and the ALPHA RLH cluster.

The LABEX Σ-LIM is organized around four flagships:

- Going beyond 5G
- Bringing new light to photonics
- Doing more with less energy
- Advanced diagnosis & therapies for promoting health

The LABEX Σ-LIM aims at strengthening the international position of the University of Limoges as a reference for the **design of advanced ceramics and innovative materials, the development of new electronic and photonic components, and the design of innovative secure communicating systems**. The complementary skills of IRCER and XLIM laboratories, covering the entire chain from **ceramic materials/processes to communication systems and health technologies**, allow the integration of innovative ceramics in new devices that meet the scientific, technological, environmental and societal challenges of today and tomorrow.

ORGANIZING TEAM

- **Éric Champion**, Head of the Health Flagship, Professor - IRCER
- **Philippe Leproux**, co-Head of the Health Flagship, Associate Professor - XLIM
- **Chantal Damia**, Associate Professor - IRCER
- **Amandine Magnaudeix**, Associate Professor - IRCER
- **Arnaud Pothier**, CNRS researcher - XLIM
- **Philippe Carré**, Professor - XLIM
- **Chrystelle Dossou-Yovo**, Valorization and administration coordinator - LABEX Σ-LIM
- **Elise Guyot**, Communication and administration coordinator - LABEX Σ-LIM

YOUR CONTACTS



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