



# NMR relaxometry for biomedicine and advanced materials

HORIZON-MSCA-DN-2021 — FC-RELAX 101072758



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## FC-RELAX Joint Training Course 1 Methodologies and instrumentation

15-17 April 2024

*Instituto Superior Técnico, Av. Rovisco Pais 1, Lisbon*

*<https://maps.app.goo.gl/Gk71r6tMVEkvdWNh6>*

*Physics Department, Seminars room (Sala de Seminários: 2-8.3)*

### Monday 15

- 9:00-9:05 Welcome
- 9:05-10:30 Danuta Kruk (UWM)  
Quantum-mechanical framework of spin relaxation theory
- 10:30-11:00 Coffee break*
- 11:00-12:30 Gianni Ferrante (Stelar)  
The field-cycling relaxometer
- 12:30-14:00 Lunch break (lunch @ [Pingo Doce Restaurant](#))*
- 14:00-15:30 Pedro Sebastiao (IST) and Gianni Ferrante (Stelar)  
Practical on NMRD measurements
- 15:30-16:00 Coffee break*
- 16:00-17:30 Danuta Kruk (UWM)  
NMRD profiles as a source of information about the mechanism of  
molecular motion
- 20:00 Dinner ([@ Hotel Holyday Inn Lisbon](#))*



**Tuesday 16**

- 9:00-10:30 Pedro Sebastiao (IST)  
Analysis of the NMRD profiles
- 10:30-11:00 Coffee break*
- 11:00-12:30 Lionel Broche (UNIABDN)  
Basics of MRI
- 12:30-14:00 Lunch break (lunch @ [Pingo Doce Restaurant](#))*
- 14:00-15:30 Pedro Sebastiao (IST)  
Data analysis of NMRD profiles using *fitteia*
- 15:30-16:00 Coffee break*
- 16:00-17:30 Lionel Broche (UNIABDN)  
Data analysis of NMRD profiles using Fitlike
- 20:00 *Dinner ([@ Hotel Holyday Inn Lisbon](#))*

**Wednesday 17**

- 9:00-10:30 Fabien Ferrage (ENS)  
How to measure relaxation rates in high-resolution NMR?
- 10:30-11:00 Coffee break*
- 11:00-12:30 Leonid Grunin (RS)  
Basics and Horizons of the TD-NMR Analysis
- 12:30-14:00 Lunch break (lunch @ [Pingo Doce Restaurant](#))*
- 14:00-15:30 Pedro Sebastião, João Figueirinhas (IST) and Fabien Ferrage (ENS)  
Practical on HR NMR measurements
- 15:30-16:00 Coffee break*

**FC-RELAX Complementary Training Course 1  
Scientific communication and research planning**

- 16:00-18:00 Joana Lobo Antunes (IST)  
Science Communication - what's in it for you?
- 18:00-18:30 **Election of the DC representatives**
- 20:00 *Dinner ([@ Hotel Holyday Inn Lisbon](#))*



## **FC-RELAX Mid-term Meeting**

18th April 2024

*Instituto Superior Técnico, Av. Rovisco Pais 1, Lisbon*

<https://maps.app.goo.gl/Gk71r6tMVEkvdWNh6>

*Physics Department, Seminars room (Sala de Seminários: 2-8.3)*

9:00-9:10 Welcome by Coordinator and Project Officer

9:10-9:30 Tour de table of the participants

9:30- 9:50 REA Project Officer presentation

9:50 -10:30 Coordinator's report

*10:30-11:00 Coffee break*

11:00-13:15 Doctoral Candidate individual reports

*13:15-14:30 Lunch break (lunch @ [Pingo Doce Restaurant](#))*

*Physics Department, Advance Training Room (Sala de Formação Avançada: 2-8.11)*

14:30-16:00 Project Officer meetings with Doctoral Candidates

16:00-16:45 Project Officer meeting with the Coordinator and beneficiaries

16:45-17:15 Feedback and open discussion

*17:15-17:30 Coffee break*

17:15-18:30 **FC-RELAX Supervisory Board meeting**

18:30-19:30 **FC-RELAX Steering Board meeting**

20:00 *Dinner ([@ Hotel Holyday Inn Lisbon](#))*



## **FC-RELAX Multidisciplinary Research Workshop**

19-20 April 2024

*Instituto Superior Técnico, Av. Rovisco Pais 1, Lisbon*

*<https://maps.app.goo.gl/Gk71r6tMVEkvdWNh6>*

*Physics Department, Seminars room (Sala de Seminários: 2-8.3)*

### **Friday 19**

Chair: Danuta Kruk

9:00-9:25 Pedro Sebastiao (IST)

Paramagnetic Relaxation Enhancement in systems with local order

9:25-9:55 Siegfried Stapf (Technische Universität Ilmenau)

Selectivity without spectral resolution - Field Cycling relaxometry applied to binary liquids in porous media

9:55-10:25 Lucia Calucci (CNR Pisa)

Exploring dynamics in disordered materials by FFC NMR relaxometry

10:25-10:50 Giacomo Parigi (UNIFI)

Field-cycling NMR relaxometry of MRI contrast agents

*10:50-11:20 [Coffee break](#)*

Chair: Giacomo Parigi

11:20-11:45 Céline Henoumont (UMONS)

Relaxometric characterization of Mn-complexes based on PycLen structure as MRI contrast agents

11:45-12:10 Zsolt Baranyai (BRACCO)

Proton exchange as an additional route to enhance the relaxivity of paramagnetic MRI contrast agents

12:10-12:40 Simonetta Geninatti Crich (University of Turin)

Exploring the Role of Water Dynamics as an Indicator of Tumor Status and Tissue Composition by Low Field Relaxometry

*12:30-14:00 [Lunch break \(lunch @ Pingo Doce Restaurant\)](#)*



## NMR relaxometry for biomedicine and advanced materials

Chair: Eurico Cabrita

14:00-14:25 Angelo Galante (UNIVAQ)

Intrinsic relaxivities of highly purified graphene oxide

14:25-14:50 Lionel Broche (UNIABDN)

Clinical applications of field-cycling imaging

14:50-15:15 Fabien Ferrage (ENS)

How dynamic is DNA?

15:15-15:45 Pavel Kadeřávek (CEITEC)

Measurement, analysis, and validation of the high-resolution relaxometry data of IDPs

16:30 *Excursion to Cabo da Roca and Sintra, dinner @ Taverna dos Trovadores in Sintra*

### Saturday 20

Chair: Fabien Ferrage

9:00-9:25 Danuta Kruk (UWM)

How to obtain translation diffusion coefficient of NMRD profiles

9:25-9:55 Carlos Geraldes (University of Coimbra)

MRI contrast agents: T1 *versus* paraCEST

9:55-10:25 Eurico Cabrita (Universidade NOVA de Lisboa)

NMR relaxation in structural biology

10:25-10:50 Leonid Grunin (RS)

The Most Used Pulse sequence in TD-NMR relaxometry

10:50-11:20 *Coffee break*

Chair: Pedro Sebastiao

11:20-11:45 Ralf Ludwig (UROS)

Computing the frequency dependent NMR relaxation of  $^1\text{H}$  nuclei in liquid water and ionic liquids

11:45-12:10 Erkki Lähderanta (LUT)

Molecular dynamics simulations of NMR relaxation of dendrimers



**NMR relaxometry for  
biomedicine and advanced materials**

12:10-12:40 Eduardo Filipe (University of Lisbon)

Towards triphasic fluids: measuring local composition with  $^{129}\text{Xe}$  NMR spectroscopy

*12:30-14:00 Lunch break*

**FC-RELAX Complementary Training Course 1  
Scientific communication and research planning**

14:00-16:00 Bruno Soares Gonçalves (IST)

Mastering Project Proposal Preparation and Planning

*16:00-16:30 Coffee break*

16:30-18:30 Bruno Soares Gonçalves (IST)

Elevate Your Career: Showcase Your Professional Value with your CV

20:00 *Dinner ([@ Hotel Holyday Inn Lisbon](#))*



## NMR relaxometry for biomedicine and advanced materials

### Venue:



Departamento de Física, Instituto Superior Técnico,  
Av. Rovisco Pais 1, Lisboa Portugal,  
<https://maps.app.goo.gl/fokW96BBuUM1FVcK8>

### Hotel:

Holiday Inn Lisboa, Av. António Jose de Almeida 28A, Lisboa, Portugal,  
<https://maps.app.goo.gl/hms1T87HyofpDaab9>

