

## Practical Sessions

Practical work will have an important place and will be organized around NMR, EPR and DNP equipment. The participants, having chosen session 1 "RPE / NMR", will carry out their PWs at the University of Strasbourg (esplanade campus and / or Illkirch) where EPR and NMR devices are available and those who have chosen the session 2 "DNP" will go on Wissembourg, at the Bruker company.

### Session 1 :

#### Institut de chimie:

- J. Raya, P. Bertani, L. Allouche, B. Vincent :

1-Solid State NMR : Cross-Polarization / Magic Angle Spinning (CP/MAS) experiment, basis. From sample preparation to NMR parameters setup.

2- Solid State NMR : Ultra-fast MAS. Setting up and running proton detected bidimensional spectra.

3- DOSY-NMR : how to determine hydrodynamic radii of molecule, calibration, setting up experiments, and processing.

- B. Vilen, N. Le Breton, N. Parizel, J. Tribollet, S. Gambarelli, S. Choua, V. Maurel, J. Robert, T. Bountalis.

1- CW-EPR: How to tune a cavity, record a spectrum, set up parameters, ...

2- CW-EPR: Fluid and glassy solutions EPR spectra,  $g$  value, hyperfine coupling.

3- Pulsed-EPR: Field sweep, two and three pulses ESEEM,  $T_1$  and  $T_2$  measurements.

4- CW-EPR: Introduction to spin trapping

#### Campus d'Illkirch :

- B. Kieffer, P. Bertani

1-Workshop NMR, oriented statistics.

### Session 2 :

#### Wissembourg, Bruker compagny

- F. Aussenac

1-Initiation and preparation of samples for DNP measurements

Preparation of a sample for DNP measurements: type of radical (polarizing agent), radical concentration, appropriate solvents. Discussions on the different methods of sample preparation. Packing the DNP sample into a MAS rotor.

Description of a solid state NMR DNP spectrometer: Low Temperature-MAS (LT-MAS) cooling cabinet, LT-MAS DNP probe, gyrotron microwave source.

DNP experiments: spinning the sample at the magic angle (MAS) at low temperature (100 K). Optimization of the microwave power from the gyrotron source. Polarization build up time and DNP enhancement measurements.