



Program

Summer School IV (Sun 16 - Sat 22 March 2025): "Hyperpolarization"

Youth hostel "Schloss Windischleuba", Pestalozziplatz 1, 04603 Windischleuba

Before you come:

- Read books about NMR in general: Malcolm Levitt: "Spin Dynamics" (Wiley) and K. Ivanov, P.K. Madhu & G. Rajalakshmi "Two-dimensional NMR methods" (Wiley).
- Try to install the program MOLSPIN from <https://molspin.eu/>.

TEACHERS

P.K. Madhu (PKM): QM, ONP on NV centers

Gunnar Jeschke (GJ): CIDEF & CIDNP

Björn Corzilius (BC): DNP

Jennifer Mathies (JM): DNP

James Eills (JE): PHIP, long-lived states

Eike Brunner (EB): SEOP, MEOP, OP on semiconductors

Ilia Solov'yov (IS) & Jonathan Hungerland: Simulation program MOLSPIN

Sunday 16 March 2024

- 16.00 Shuttle bus transfer from railway station "Bahnhof Altenburg"
- 18.00 Shuttle bus transfer from railway station "Bahnhof Altenburg"
- Arrival by individual travel, check-in, registration
- 19.00 Dinner & Get together
- 20.00-20.30 Opening remarks, Participants introduce each other, About the place
- 20.30-22.00 **Lecture 01: PKM: Overview**

Monday 17 March 2024

- 07.30-08.30 Breakfast
- 09.00-10.30 **Lecture 02: PKM: NV centers, part I**
- 10.30-11.00 Coffee/tea
- 11.00-12.30 **Lecture 03: BC: Solid-effect, thermal mixing, cross-effect**
- 12.30-13.00 Lunch
- 13.00-14.00 Break/visit of the castle/volleyball/garden & walk
- 14.00-15.30 **Lecture 04: PKM: NV centers, part II**
- 15.30-16.00 Coffee/Tea
- 16.00-17.30 **Lecture 05: BC: MAS DNP, instrumentation, applications, developments**
- 18.00-19.00 Dinner
- 19.00-20.30 **Lecture 06: GM: Overhauser DNP, instrum., applications, developments**
- Afterwards: assistance in installing MOLSPIN**

Tuesday 18 March 2024

- 07.30-08.30 Breakfast

09.00-10.30 Lecture 07: BC: dDNP & bullet DNP incl. instrumentation and enhanced MRI
10.30-11.00 Break
11.00-12.30 Lecture 08: GM: Polarizing agents

12.30-13.00 Lunch
13.00-14.00 Break
14.00-15.30 Lecture 09: GM: Pulsed DNP, triplet DNP
15.30-16.00 Coffee/Tea
16.00-17.30 Lecture 10: GJ: SCRPs, CIDEF, liq CIDNP
18.00-19.00 Dinner
19.00-20.30 Exercise 1: DFT for molecular parameters (using MolSpin)

Wednesday 19 March 2024

07.30-08.30 Breakfast
08:30 Starting by coach to XXX
10:30-11:30 XXX
11:30-15:00 XXX
15:00 Return by coach
16:15-17:45 Lecture 11: GJ: Solid-state photo-CIDNP, part I
18.00-19.00 Dinner
19.00-20.30 Exercise 2: DNP (using MolSpin)

Thursday 20 March 2024

07.30-08.30 Breakfast
09.00-10.30 Lecture 12: GJ: Solid-state photo-CIDNP, part II
10.30-11.00 Break
11.00-12.30 Lecture 13: JE: Introduction to PHIP

12.30-13.00 Lunch
13.00-14.00 Break
Foto
14.00-15.30 Lecture 14: GJ: Quantum-rotor induced nuclear hyperpolarization
15.30-16.00 Coffee/Tea
16.00-17.30 Lecture 15: JE: Polarization transfer
18.00-19.00 Dinner
19.00-20.30 Exercise 3: liq vs solid CIDNP (using MolSpin)

Friday 21 March 2024

07.30-08.30 Breakfast
09.00-10.30 Lecture 16: EB: SEOP
10.30-11.00 Break
11.00-12.30 Lecture 17: JE: State-of-the-art and beyond

12.30-13.00 Lunch
13.00-14.00 Break
14.00-15.30 Lecture 18: EB: Other optimal pumping based methods & practical aspects
15.30-16.00 Coffee/Tea
16.00-17.30 Exercise 4: Spin-dynamics in LOV domains (using MolSpin)
Feedback by students, Final remarks

19.00-22.00 Conference Dinner

Saturday 22 March 2024

07.30-09:30 Breakfast

10:15 Travelling home (direct bus transfer to Leipzig central station/Hbf)