

**Version September 10th, 2007 programme of CRYOCOURSE 2007**

Friday, September 14, 2007

13:00	14:00	Welcome and Registration at <b>CNRS-Grenoble</b>	
14:30	16:30	Visit of a Cryogenic industrial site (l'Air Liquide/DTA)	
16:30		Departure to Chichilianne	
19:30	20:30	Dinner	

Saturday, September 15 (Chichilianne)

9:00	10:00	Welcome - introduction to Cryocourse - instructions	
10:00	11:00	Thermodynamics I	H. Godfrin
11:00	11:30	Pause	
11:30	12:30	Statistical Physics	H. Godfrin
12:30	14:00	Lunch	
14:00	15:00	Condensed Matter at Low Temperatures	L. Lévy
15:00	16:00	Properties of metals (resistivity, Hall effect)	K. Kheng
16:00	16:30	Pause	
16:30	17:30	Properties of solids (heat capacity)	J.-P. Brison
17:30	18:30	Properties of solids (thermal conductivity)	J.-P. Brison
19:30	20:30	Dinner	

Sunday, September 16 (Chichilianne)

9:00	10:00	Heat transfer, Thermal isolation and thermal contact	C. Enss
10:00	11:00	Properties of solids (thermal expansion, magnetostriction)	M. Amara
11:00	11:30	Pause	
11:30	12:30	Quantum Fluids and Solids	C. Enss
12:30	14:00	Lunch	
14:00	15:00	Properties of Cryogenic fluids	G. Donnier-Valentin
15:00	16:00	Storage and transfer of Cryofluids	C. Gianèse
16:00	16:30	Pause	
16:30	17:30	Safety and good practice in handling Cryofluids	C. Gianèse
17:30	18:30	Thermodynamics II	A. de Waele
19:30	20:30	Dinner	

Monday, September 17 (Chichilianne)

9:00	10:00	Cryostat design	G. Donnier-Valentin
10:00	11:00	4He and 3He cryostats	G. Donnier-Valentin
11:00	11:30	Pause	
11:30	12:30	Introduction to dilution refrigerators - thermodynamics	A. de Waele
12:30	14:00	Lunch	
14:00	15:00	Dilution refrigerators - design and operation	H. Godfrin
15:00	16:00	Dilution refrigerators - the industrial point of view	S. Triqueneaux
16:00	16:30	Pause	
16:30	17:30	Adiabatic demagnetisation	Yu. Bunkov
17:30	18:30	Discussion of problems	
19:30	20:30	Dinner	

Tuesday, September 18 (Chichilianne)

9:00	10:00	Cryocoolers - principles	A. de Waele
10:00	11:00	Micro-coolers	H. Courtois
11:00	11:30	Pause	
11:30	12:30	Low temperature techniques and tricks	H. Godfrin
12:30	14:00	Lunch	
14:00	15:00	SQUIDs	A. de Waele

15:00	16:00	Micromechanical resonators - Pressure sensors	E. Collin
16:00	16:30	Pause	
16:30	17:30	NMR at low temperatures	E. Collin
17:30	18:30	Discussion of problems	
19:30	20:30	Dinner	

Wednesday, September 19 (Chichilianne)

9:00	10:00	Vacuum and low temperatures	C. Enss
10:00	11:00	Electronics and low temperatures	J.-L. Mocellin
11:00	11:30	Pause	
11:30	12:30	Photons and low temperatures	N. Bonifaci
12:30	14:00	Lunch	
14:00	15:00	Neutrons and low temperatures	H. Godfrin
15:00	16:00	High pressures at low temperatures	M. Nuñez Regueiro
16:00	16:30	Pause	
16:30	19:30	Discussion of problems	
19:30	20:30	Dinner	

Thursday, September 20 (Chichilianne)

9:00	10:00	Disordered solids at low temperatures	C. Enss
10:00	11:00	Superconductivity	J.-P. Brison
11:00	11:30	Pause	
11:30	12:30	Superfluid 3He	Yu. Bunkov
12:30	14:00	Lunch	
14:00	19:00	Excursion in Chichilianne	
19:30	20:30	Dinner	

Friday September 21 (Chichilianne)

9:00	10:00	Thermometry : principles and temperature scale	H. Godfrin
10:00	11:00	Thermometry : practical thermometry 1	H. Godfrin
11:00	11:30	Pause	
11:30	12:30	Thermometry : practical thermometry 2	H. Godfrin
12:30	14:00	Lunch	
14:00	15:00	Discussion and problems	
15:00	16:30	Cryocoolers - the industrial approach	A. Ravex
16:30	17:00	Pause	
18:00		Departure to Grenoble	
20:00	21:00	Dinner	

Saturday, September 22 (Grenoble)

9:00	11:00	Superconducting Engineering 1	P. Tixador
11:00	11:30	Pause	
11:30	12:30	Superconducting Engineering 2	P. Tixador
12:30	14:00	Lunch	
14:00	16:00	Superconducting Magnets - theory and design	G. Donnier-Valentin
16:00	16:30	Pause	
16:30	17:30	Low temperature astrophysical detectors	A. Monfardini
17:30	18:30	Cryogenic space applications	G. Vermeulen
19:30	20:30	Dinner	

Sunday, September 23 (Grenoble)

9:00	12:30	Free morning in Grenoble	
12:30	14:00	Lunch	
14:00	19:30	Free afternoon in Grenoble	
19:30	20:30	Dinner	

Monday, September 24 (Grenoble)

10:00	12:30	Visit of the Helium Liquefier plant and LT laboratory	C. Gianèse/H. Godfrin
12:30	14:00	Lunch	
14:00	17:00	hands-on courses A to E in parallel	
17:00	17:30	Pause	
17:30	18:30	Discussion	
19:30	20:30	Dinner	

Tuesday, September 25 (Grenoble)

9:00	10:30	hands-on courses A to E in parallel	
10:30	11:00	Pause	
11:00	12:30	hands-on courses A to E in parallel	
12:30	14:00	Lunch	
14:00	17:00	hands-on courses A to E in parallel	
17:00	17:30	Pause	
17:30	18:30	Discussion	
19:30	20:30	Dinner	

Wednesday, September 26 (Grenoble)

9:00	10:30	hands-on courses A to E in parallel	
10:30	11:00	Pause	
11:00	12:30	hands-on courses A to E in parallel	
12:30	14:00	Lunch	
14:00	17:00	hands-on courses A to E in parallel	
17:00	17:30	Pause	
17:30	19:00	Discussion and evaluation	
20:00	23:30	Closing ceremony and dinner	

Thursday, September 27 (Grenoble)

Departure from Grenoble			
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**Hands-on: experimental courses**

3 hours courses (5 groups of 2\*4 students)

Course A - Superconducting magnets	G. Donnier-Valentin
Course B - Cryogenic workshop/Vacuum and leak detection	G. Donnier-Valentin
Course C - Electronics workshop	J.L. Mocellin
Course D - Handling of cryogenic fluids/superfluid 4He	C. Gianèse
Course E - Thermometry and temperature control	Ph. Gandit