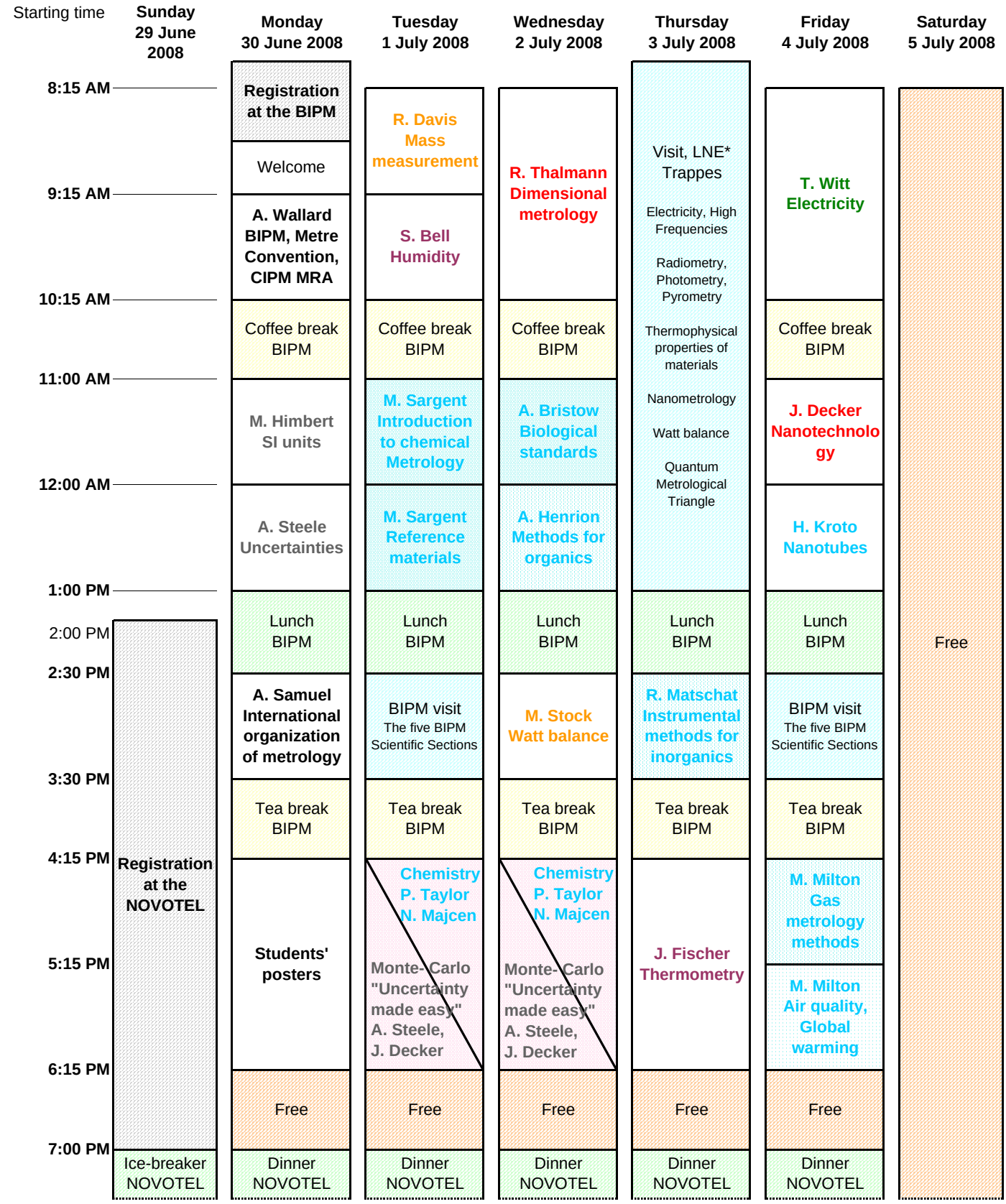
BIPM Metrology Summer School 2008

Time Table



Workshop: 2 parallel sessions with short talks, practical activities and discussion

"Students' posters": follow-up of the "ice-breaker"; free presentation of posters brought by the students

*** partnership with the Laboratoire National de Métrologie et d'Essais (LNE) and the Paris Observatory (OP)**

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Time Table

Starting time	Sunday 6 July 2008	Monday 7 July 2008	Tuesday 8 July 2008	Wednesday 9 July 2008	Thursday 10 July 2008	Friday 11 July 2008
8:15 AM	Free	R. Steiner Design of an experiment (Watt balance)	A. Bauch µ-wave clocks and fountains	Visit, Paris Observatory*	P. Andreo Medical applications of Ionizing radiation	K. von Klitzing QHE
9:15 AM		K. Fujii Avogadro project	P. Lemonde Combs and optical clocks	Introduction by D. Egret OP President	L. Karam Radioactivity	B. Wood CODATA
10:15 AM		Coffee break BIPM	Coffee break BIPM	D. Sobel Longitude	Coffee break BIPM	Coffee break BIPM
11:00 AM		F. Ahlers Quantum electrical standards	P. Tavella Time scales	P. Wolf New clocks and fundamental physics	P. Andreo Dosimetry	B. Wood New SI
12:00 AM		S. Giblin SET	BIPM visit The five BIPM Scientific Sections		BIPM visit The five BIPM Scientific Sections	Conclusions
1:00 PM		Lunch BIPM	Lunch BIPM	Lunch BIPM	Lunch BIPM	Lunch BIPM
2:30 PM		W. Phillips Cold atoms, Bose-Einstein Condensation	BIPM visit The five BIPM Scientific Sections	M. Mariassy Electrochemistry	J. Zwinkels Photometry and Radiometry	
3:30 PM			Tea break BIPM	Tea break BIPM	Tea break BIPM	
4:15 PM		Tea break BIPM	Electricity N. Fletcher B. Wood QS, KCDB, Accreditation, ISO Guide 34 M. Sargent C. Thomas D. Pierre	L. Thienpont Laboratory medicine	W. Unger Surface analysis	
5:15 PM		Electricity N. Fletcher B. Wood QS, KCDB, Accreditation, ISO Guide 34 M. Sargent C. Thomas D. Pierre		S. Wise Food	H. Schimmel DNA and proteomics	
6:15 PM		Free	Free	Free	Free	
7:00 PM		Dinner NOVOTEL	Dinner NOVOTEL	Dinner NOVOTEL	Summer School Party	

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Subject fields covered by the Summer School: Lectures and Complements

	Lectures	Complemented by
Organisational Metrology	**BIPM** **Metre Convention** **CIPM MRA, KCDB** **International Organization of Metrology** **Quality System** **Accreditation, ISO Guide 34 for CRMs**	**QS, KCDB, Accreditation, and ISO Guide 34 workshop**
General scientific aspects of Metrology	**Uncertainties** **Comparisons** **Data analysis** **Classical SI** **Fundamental constants and CODATA** **New SI** **Design of an experiment**	**Monte-Carlo - "Uncertainty made easy" workshop**
Mass	**Mass measurements** **Watt balance** **Avogadro constant** **Avogadro project**	**Visit at the BIPM Mass Section** **Visit at the BIPM Electricity Section** **Visit at the LNE**
Length	**Dimensional metrology** **Nanotechnology** ↕	**Visit at the BIPM Time, Frequency and Gravimetry Section** **Visit at the LNE**
	Nanotubes	

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Subject fields covered by the Summer School: Lectures and Complements

	Lectures	Complemented by
Chemistry	Introduction to chemical metrology Reference materials Biological standards Methods for organics Instrumental methods for inorganic Gases, Air quality, Global warming Electrochemistry Laboratory medicine Food Surface analysis DNA fingerprinting	Visit at the BIPM Chemistry Section Chemistry workshop
Thermometry	Classical thermometry Boltzmann constant Humidity	Visit at the LNE
Electricity	Classical electricity Quantum Hall Effect Quantum electrical standards R_K, K_J, h Single Electron Tunneling	Visit at the BIPM Electricity Section Visit at the LNE Electricity workshop

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Subject fields covered by the Summer School: Lectures and Complements

	Lectures	Complemented by
Time and Frequency	**Cold atoms** **Bose-Einstein condensation** **Micro-wave clocks and fountains** **Combs** **Optical clocks** **Time scales** **Time links** **Time and fundamental Physics** **Longitude**	**Visit at the BIPM Time, Frequency and Gravimetry Section** **Visit at the OP**
Photometry and radiometry	**Classical methods in PR**	**Visit at the LNE**
Ionizing Radiation	**Dosimetry** **Radioactivity** **Linear accelerator** **Medical applications**	**Visit at the BIPM Ionizing Radiation Section**

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Subject fields covered in Chemistry

Timetable order	Topic group	Short title	Long title (summary of content)	Speaker
1	Introductory	Introduction to chemical metrology	Role of metrology in chemistry, classical chemical analysis, general traceability and uncertainty issues	Mike Sargent
2	Introductory	Reference materials	Production and value assignment of CRMs: primary calibrators, calibration solutions and matrix reference materials, isotopic standards	Mike Sargent
3	Introductory	Biological standards	History of biological standards and reference methods, the International Unit and the challenges of moving to the SI	Adrian Bristow
4	Methodology	Instrumental methods for organics	Evolution of instrumental techniques for metrology, chromatograohic applications, mass spectrometry, sample preparation issues	Andre Henrion
5	Methodology	Instrumental methods for inorganics	Evolution of instrumental techniques for metrology, XRF, AAS, ICP-OES, ICP-MS, sample preparation issues, ion exchange (anions), other chromatograohic applications	Ralf Matschat
6	Methodology	Gas metrology methods and standards	Gravimetric techniques, use of chromatography and mass spec, production and value assignment of gas standards	Martin Milton
8	Methodology	Electrochemistry	Electrochemistry - methods and measurement standards for pH, electrolytic conductivity and salinity	Michal Mariassy
7	Application	Environmental gas measurement applications	Role of traceable gas standards for air quality and green house gas monitoring	Martin Milton

Timetable order	Topic group	Short title	Long title (summary of content)	Speaker
9	**Application**	**Laboratory medicine**	Laboratory medicine: from reference methods to patient sample analysis	Linda Thienpont
10	**Application**	**Traceable measurements in food safety**	Role of traceable measurements in food analysis	Steve Wise
11	**Application**	**Surface analysis**	Surface analysis	Wolfgang Unger
12	**Application**	**DNA and proteomics**	The measurement science of DNA fingerprinting, GMO determinations, etc	Heinz Schimmel

The three blue colours for the background are reported in the Time Table to visualize the progression.