

XVII International Conference on Atomic Physics

ICAP-2000

Firenze, Italy, June 4-9, 2000

Scientific Program

SUNDAY, June 4

Welcome afternoon and **Registration** at Museo di San Marco (*see below in Social Program for details*).

MONDAY, June 5

Opening	9.00-9.20
Session: Costant Measurements I (<i>Chairman: D. Wineland</i>)	
S. Chu (Stanford, USA) <i>Progress in the h/m measurement</i>	9.20-10.05
R. Holzwarth (Max-Planck, Garching, D) <i>Optical frequency metrology and its contribution to the determination of fundamental constants</i>	10.05-10.35
• Coffee Break	10.35-11.05
Session: Costant Measurements II (<i>Chairman: G. Drake</i>)	
D. Pritchard (MIT, USA) <i>Single ion mass spectrometry and the fine structure constant</i>	11.05-11.50
V.V. Flambaum (Sydney, Australia) <i>Does the fine structure constant vary with time and distance?</i>	11.50-12.35
• Lunch Break	12.35-15.00
Session: Single Species I (<i>Chairman: R. Blatt</i>)	
H.J. Kimble (Caltech, USA) <i>Real-time tracking and trapping of single atoms in cavity QED</i>	15.00-15.45
G. Gabrielse (Harvard, USA) <i>Observing the quantum limit of an electron cyclotron: QND measurements of quantum jumps between Fock states</i>	15.45-16.30
• Coffee Break	16.30-17.00

Session: Single Species II (Chairman: S. Califano)

- M. Orrit (Bordeaux, F) 17.00-17.45
Coupling single molecules to laser fields
- D. Leibfried (Innsbruck, A) 17.45-18.15
Experiments towards quantum information with trapped calcium ions

TUESDAY, June 6

Session: Entanglement (Chairman: F.T. Arecchi)

- S. Haroche (ENS, Paris, F) 9.00-9.45
Step by step engineered entanglement with atoms and photons in a cavity
- A. Steane (Oxford, UK) 9.45-10.15
Quantum computing with trapped ions, atoms and light
- C. Monroe (NIST, Boulder, USA) 10.15-10.45
Entanglement of four atoms
- Coffee Break 10.45-11.15

Session: Dark Resonances (Chairman: H. Metcalf)

- S. Harris (Stanford, USA) 11.15-12.00
Nonlinear optical and acoustic processes using EIT
- L. Hollberg (NIST, Boulder, USA) 12.00-12.30
Destruction of darkness: optical coherence effects and multi-wave mixing in rubidium vapor
- Lunch Break 12.30-15.00

Session: Atomic Femtosecond Spectroscopy (Chairman: V. Balykin)

- P.H. Bucksbaum (Ann Arbor, USA) 15.00-15.45
Ultrafast quantum control in atoms

Poster Session I (Posters B, C, D, F, J) 15.45-18.45

WEDNESDAY, June 7

Session: QED with Ions, Atoms, and Muonic Systems I (Chairman: N. Fortson)

- V. Hughes (Yale, USA) 9.00-9.45
The muon anomalous magnetic moment
- S.G. Karshenboim (St. Petersburg, Russia) 9.45-10.30
Precision physics of simple atoms
- Coffee Break 10.30-11.00

Session: QED with Ions, Atoms, and Muonic Systems II (Chairman: I. Lindgren)

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| R. Casalbuoni (Firenze, I) | 11.00-11.45 |
| <i>The impact of atomic precision measurements in high energy physics</i> | |
| J.D. Silver (Oxford, UK) | 11.45-12.30 |
| <i>Tests of QED effects in hydrogenic ions</i> | |
| W. Quint (Darmstadt, D) | 12.30-13.00 |
| <i>The g-factor of the bound electron in hydrogen-like ions: a high-accuracy test of bound-state QED</i> | |

• Lunch Break 13.00-15.00

Session: Time Measurements (in Palazzo Vecchio -Chairman: N. Ramsey)

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| P. Galluzzi (Firenze, I) | 17.00-17.40 |
| <i>Galileo's clocks</i> | |
| W.D. Phillips (NIST, Gaithersburgh, USA) | 17.40-18.20 |
| <i>Time, Einstein, and the coldest thing in the Universe</i> | |
| M. Kasevich (Yale, USA) | 18.20-19.00 |
| <i>Measurement of earth rotation and gravitation with atom interferometry</i> | |
| C. Salomon (ENS, Paris, F) | 19.00-19.40 |
| <i>Cold atom clocks</i> | |

THURSDAY, June 8

Session: Gravitational Waves and Detectors (Chairman: J. Hall)

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| K. Danzmann (Hannover,D) | 9.00-9.45 |
| <i>Gravitational wave detectors on the Earth and in the Heavens</i> | |
| D. Shoemaker (MIT, USA) | 9.45-10.30 |
| <i>Interferometry for ground-based gravitational wave detection</i> | |
| A. Heidmann (ENS, Paris, F) | 10.30-11.00 |
| <i>Thermal noise and radiation pressure effects in interferometric measurements</i> | |

• Coffee Break 11.00-11.30

Session: Post Deadline I (Chairman: R. Corbalan)

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| J. Dalibard (ENS, Paris, F) | 11.30-11.50 |
| <i>Quantized vortices in a gaseous Bose-Einstein condensate</i> | |
| N. Westbrook (Orsay, F) | 11.50-12.10 |
| <i>Bouncing atoms: a coherent nanoprobe</i> | |
| E.A. Hinds (Brighton, UK) | 12.10-12.30 |
| <i>Propagation of cold atoms along a miniature guide</i> | |

• Lunch Break 12.30-15.00

Session: Post Deadline II (Chairman: L. Moi)

P. Froelich (Uppsala, S) 15.00-15.20
Hydrogen-antihydrogen collisions

M. Ducloy (Villetaneuse, F) 15.20-15.40
*Atom symmetry breaking in Van der Waals surface interaction:
metastable level coupling in argon and krypton atoms on a copper
surface*

Poster Session II (Posters A, E, G, H, I) 15.40-18.40

FRIDAY, June 9

Session: Laser Cooling and Applications I (Chairman: F. Shimizu)

C. Cohen-Tannoudji (ENS, Paris, F) 9.00-9.45
*Wave functions, relative phase and interference for Bose-condensed
atoms*

E. Cornell (JILA, Boulder, USA) 9.45-10.30
*Correlations and implosions: experiments with a Bose-Einstein
condensate with an adjustable scattering length*

• Coffee-break 10.30-11.00

Session: Laser Cooling and Applications II (Chairman: P. Hannaford)

V. Vuletic (Stanford, USA) 11.00-11.30
Laser cooling: beyond optical molasses

Z.-T. Lu (Argonne, USA) 11.30-12.00
Potential applications of atom trap trace analysis

H. Katori (Kawasaki, Japan) 12.00-12.30
Laser cooling of strontium toward quantum degeneracy

• Lunch Break 12.30-15.00

Session: Degenerate Matter I (Chairman: W. Hogervost)

W. Ertmer (Hannover, D) 15.00-15.45
Manipulation and phase engineering of BEC

D.S. Jin (JILA, Boulder, USA) 15.45-16.30
Exploring a quantum degenerate Fermi gas

• Coffee Break 16.30-17.00

Session: Degenerate Matter II (Chairman: D. Kleppner)

S. Stringari (Trento, I) 17.00-17.45
Superfluidity of rotating atomic gases in traps

W. Ketterle (MIT, USA) 17.45-18.30
New light on Bose-Einstein condensates

All scientific sessions, except the oral session of Wednesday June 7 afternoon, will take place in the Scuola Marescialli e Brigadieri dei Carabinieri, in the Aula Magna and the Cloisters for oral and poster sessions, respectively. The Scuola is located in **Piazza della Stazione, and the side entrance at n. 6** is reserved for ICAP-2000 participants.

Registration of participants will be opened on Sunday June 4, during the Welcome Afternoon (16.00-19.30) at Museo di San Marco (see Social Program below for details). A Secretary Office will be available for registration all during the Conference period in Scuola Marescialli e Brigadieri dei Carabinieri. The office will open at 8.00 in Monday June 5, and at 9.00 in the following days.

Social Program

SUNDAY, June 4 (at Museo di San Marco)

16.00-19.30: Conference Registration and Welcome afternoon at Museo di San Marco, exceptionally opened for the visit of ICAP-2000 participants. Concert at 17.30 by Tommaso Tarani and Rossella Giannetti. Refreshments served at 18.30.

Please note that the main entrance to the Museum will be closed. Instead, the side entrance round the corner in **Via La Pira, n. 1** will be open for ICAP-2000 participants and accompanying persons.

WEDNESDAY, June 7 (at Palazzo Vecchio)

19.30: Concert by Pierluigi Mencarelli and Margherita Gallini in Salone dei Cinquecento, Palazzo Vecchio. Afterwards there will be a cocktail reception by courtesy of the City Mayor at "Chiostro del Bonalenti", Palazzo Vecchio.

THURSDAY, June 8 (at Villa Viviani)

20.00: Concert performed by the Fanfara dei Carabinieri, Director Maresciallo Ennio Robbio, followed by the Conference Dinner. Buses to Villa Viviani will collect participants and accompanying persons in Piazza della Stazione, in front of the Scuola dei Carabinieri, starting from 19.00.