

# Fundamental physics with **LIGHT & ATOMS**

*Celebration of the International Year of Light*



**Torino, January 27<sup>th</sup>, 2015**

INRIM, Strada della Cacce, 91

*This Workshop is the first event of the IYL  
following the official opening ceremony  
in the Senate Chamber of Palazzo Madama*

Anton  
Zeilinger

Immanuel  
Bloch

Thomas  
Udem

Patrick  
Gill

Wolfgang  
Ketterle

Élisabeth  
Giacobino

Wim  
Ubachs

Chairmen:

Massimo Inguscio (INRIM, LENS and University of Firenze)

Filippo Levi (INRIM)

Sandro Stringari (University of Trento)

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UNIVERSITÀ DEGLI STUDI  
DI TRENTO  
Dipartimento di Fisica



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• Programme of EURAMET  
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within EURAMET and the European Union





## PROGRAM

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- 9:00 - 9:10    **Opening remarks: Massimo Inguscio and Sandro Stringari**
- 9:10 - 9:55    *"Light as a tool to study new forms of matter near absolute zero temperature"*  
**Wolfgang Ketterle**, John D. MacArthur Professor of Physics, Research Laboratory for Electronics, MIT-Harvard Center for Ultra-cold Atoms, and MIT Department of Physics (USA)
- 9:55 - 10:40    *"Superfluid properties of light in a nonlinear medium"*  
**Elisabeth Giacobino**, Laboratoire Kastler Brossel, Université Pierre et Marie Curie, Ecole Normale Supérieure, and CNRS (France)
- 10:40 - 11:00    Coffe break
- 11:00 - 11:45    *"Light and the most accurate frequency measurements"*  
**Patrick Gill**, National Physical Laboratory (UK)
- 11:45 - 12:30    *"From topological Bloch bands to quantum magnetism with Rydberg atoms - New perspectives for ultracold gases"*  
**Immanuel Bloch**, Max Planck Institute of Quantum Optics and Ludwig-Maximilians University, Physics Department (Germany)
- 12:30 - 14:00    Lunch
- 14:00 - 14:15    **International Holocaust remembrance day**
- 14:15 - 15:00    *"Precision spectroscopy of atomic hydrogen"*  
**Thomas Udem**, Max Planck Institute of Quantum Optics (Germany)
- 15:00 - 15:45    *"Frontiers of photon entanglement"*  
**Anton Zeilinger**, University of Vienna and Austrian Academy of Sciences (Austria)
- 15:45 - 16:30    *"Light from the early Universe and the nature of physical law"*  
**Wim Ubachs**, VU University Amsterdam, Department of Physics and Astronomy (The Netherlands)
- 16:30 - 18:00    Poster Session (chair **Francesco Minardi**, CNR-INO and LENS)

### Discussant of the lectures will be:

**Davide Calonico** (INRIM), **Paolo De Natale** (CNR-INO and LENS), **Marco Genovese** (INRIM), **Stefano Giorgini** (University of Trento), **Leonardo Fallani** (University of Firenze and LENS), **Gabriele Ferrari** (CNR and University of Trento), **Paolo Mataloni** (University of Roma "La Sapienza")

**Scientific Committee:** **Filippo Levi** (INRIM), **Massimo Inguscio** (INRIM, LENS and University of Firenze), **Sandro Stringari** (University of Trento)