

# Table of Contents

## Invited Talks

### Nobel Laureate Session I

Sunday, July 27, 2:00 pm – 3:55 pm

More News from Flatland: a 2D Bose gas at NIST . . . . .	2
<i>William D. Phillips</i>	
When is a Quantum Gas a Quantum Liquid? . . . . .	3
<i>Eric A. Cornell</i>	
Cooperative Spontaneous Emission and Scattering of Light: A Theory of Coherent Radiation Damping . . . . .	4
<i>Roy J. Glauber</i>	

### Nobel Laureate Session II

Sunday, July 27, 4:25 pm – 5:40 pm

Coherent control of matter: a multiple-photon atom interferometer to measure $h/M_{Cs}$ , and strongly correlated (Laughlin) states in rotating Bose Condensates . . . . .	5
<i>Steven Chu</i>	
Herbert Walther, scientist extraordinaire . . . . .	6
<i>Pierre Meystre</i>	
Willis E. Lamb Jr. (July 12, 1913 - May 15, 2008) . . . . .	7
<i>Paul R. Berman</i>	

### Precision Measurements

Monday, July 28, 8:30 am – 10:15 am

Precision atom interferometry . . . . .	8
<i>Mark Kasevich</i>	
New Measurement of the Electron Magnetic Moment and the Fine Structure Constant . . . . .	9
<i>Gerald Gabrielse</i>	
Determination of the fine structure constant with atom interferometry and Bloch oscillations . . . . .	10
<i>François Biraben</i>	

---

## Table of Contents

---

### Atomic Clocks

*Monday, July 28, 10:45 am – 12:30 pm*

Optical Atomic Clocks . . . . .	11
<i>Thomas Udem</i>	
Comparison of Two Single-Ion Optical Clocks . . . . .	12
<i>Till Rosenband</i>	
Precise Measurements of s-wave Scattering Phase Shifts with a Juggling Atomic Clock . . . . .	13
<i>Kurt Gibble</i>	

### Quantum Information

*Monday, July 28, 2:00 pm – 3:45 pm*

Quantum information and non-equilibrium condensed matter physics with cold atoms . . . . .	14
<i>Peter Zoller</i>	
Progress towards a quantum repeater . . . . .	15
<i>Alex Kuzmich</i>	
Single atoms in optical tweezers for quantum computing . . . . .	16
<i>Antoine Browaeys</i>	

### Trapped Ions

*Tuesday, July 29, 8:30 am – 10:15 am*

Atomic physics, quantum optics, and quantum information processing with trapped ions . . . . .	17
<i>Rainer Blatt</i>	
Cryogenic microfabricated ion traps: Explorations of surface physics with ions . .	18
<i>Isaac L. Chuang</i>	
Cold molecular ions: Single molecule studies . . . . .	19
<i>Michael Drewsen</i>	

### Quantum Optics & Cavity QED

*Tuesday, July 29, 10:45 am – 12:30 pm*

Observation of light quantum jumps and time-resolved reconstruction of field states in a cavity . . . . .	20
<i>Serge Haroche</i>	
Pseudo-Spin Squeezing on an Atomic-Clock Transition . . . . .	21
<i>Vladan Vuletić</i>	
Quantum micro-mechanics with ultracold atoms . . . . .	22
<i>Dan Stamper-Kurn</i>	

---

Table of Contents

**Hot Topics I**

*Tuesday, July 29, 2:00 pm – 3:45 pm*

Quantum metrology with lattice-confined ultracold Sr atoms . . . . .	23
Jun Ye	
Quantum control of spins and photons at nanoscales . . . . .	24
Mikhail D. Lukin	
Anderson localization of matter waves . . . . .	25
Philippe Bouyer	
Anderson localization of a non-interacting Bose-Einstein condensate . . . . .	26
Massimo Inguscio	
Ultracold Physics at UConn, Including Spectra of Ultracold Molecules . . . . .	27
William C. Stwalley	

**Public Lecture**

*Tuesday, July 29, 8:00 pm – 8:45 pm*

From the hot big bang to the coldest temperatures ever achieved . . . . .	28
Wolfgang Ketterle	

**Bose Gases**

*Wednesday, July 30, 8:30 am – 10:15 am*

Disorder-Induced Localization in a Bose-Einstein Condensate . . . . .	29
Randall G. Hulet	
A purely dipolar quantum gas . . . . .	30
Tilman Pfau	
1D Bose gases . . . . .	31
David Weiss	

**Fermi Gases**

*Wednesday, July 30, 10:45 am – 12:30 pm*

Fermi Gases with Tunable Interactions . . . . .	32
John E. Thomas	
Photoemission Spectroscopy for Ultracold Atoms . . . . .	33
Deborah Jin	
Universality in Strongly Interacting Fermi Gases . . . . .	34
Peter D. Drummond	

**Optical Lattices**

*Thursday, July 31, 8:30 am – 10:15 am*

Coherent control of pairs of atoms in a double-well optical lattice. . . . .	35
James V. Porto	

---

Table of Contents

---

Minimum instances of topological matter in an optical plaquette . . . . . 36  
*Belén Paredes*

Atom interferometry with a weakly interacting Bose-Einstein condensate . . . . . 37  
*Giovanni Modugno*

**Cold Molecules**

*Thursday, July 31, 10:45 am – 12:30 pm*

Formation of cold molecules or/and laser cooling of molecules . . . . . 38  
*Pierre Pillet*

Ultracold halo dimers and few-body physics . . . . . 39  
*Rudolf Grimm*

Strong Dissipation Inhibits Losses and Induces Correlations in Cold Molecular Gases . . . . . 40  
*Stephan Dürr*

**Hot Topics II**

*Thursday, July 31, 2:00 pm – 3:45 pm*

Quantum Universality in Few-Body Systems . . . . . 41  
*Cheng Chin*

Number squeezing and entanglement in a Bose Einstein condensate . . . . . 42  
*Markus K. Oberthaler*

Mapping the phase diagram of a two-component Fermi gas with strong interactions 43  
*Yong-Il Shin*

Towards Quantum Magnetism with Ultracold Quantum Gases in Optical Lattices 44  
*Immanuel Bloch*

Circuit QED: Recent Results in Quantum Optics with Superconducting Circuits . 45  
*Robert Schoelkopf*

**Mesoscopic Quantum Systems**

*Friday, August 1, 8:30 am – 10:15 am*

Dispersively coupled optomechanical systems: a new approach to quantum optics with radiation pressure . . . . . 46  
*Jack G. E. Harris*

Cavity Optomechanics: Backaction Cooling of Mechanical Oscillators . . . . . 47  
*Tobias J. Kippenberg*

Exciton-polariton condensation in semiconductor microcavities . . . . . 48  
*Yoshihisa Yamamoto*

**Ultrafast Phenomena**

*Friday, August 1, 10:45 am – 12:30 pm*

The frontiers of attosecond physics . . . . . 49  
*Louis F. DiMauro*

---

Table of Contents

---

Strong field control of x-ray processes . . . . .	50
<i>Linda Young</i>	
Probing Atomic Wavefunctions via Strong Field Light-Matter Interaction . . . . .	51
<i>Nirit Dudovich</i>	

## Poster Session I: Monday, July 28, 4:15 pm – 6:00 pm

### Atomic and Ionic Structure

<b>MO1</b>	Multi-configuration Dirac-Fock Calculations for Atomic Structures of Ca <sup>+</sup> . . . . .	54
<b>MO2</b>	Isotope shift in the electron affinity of sulfur: observation and theory . . . . .	55
<b>MO3</b>	On the Importance of an Electric Octupole Contribution to the Radiative Decay of Two Metastable States in Ar <sup>+</sup> . . . . .	56
<b>MO4</b>	Atomic Data for Heavy Atoms and Ions (72<Z<86) : A Progress Report . . . . .	57
<b>MO5</b>	Theoretical Analysis of Precision Calculation of Helium-like Excited Energy Levels . . . . .	58

### Spectroscopy

<b>MO6</b>	High-Resolution Laser Spectroscopy of a Bose Einstein Condensate Using the Ultranarrow Magnetic Quadrupole Transition . . . . .	59
<b>MO7</b>	High efficiency frequency upconversion in rubidium vapor . . . . .	60
<b>MO8</b>	Two photon spectroscopy in atomic hydrogen at 205 nm using a picosecond laser . . . . .	61
<b>MO9</b>	Laser spectroscopy in wall-coated alkali vapour cells . . . . .	62
<b>MO10</b>	A high-power, Fourier-transform limited light source for precision spectroscopy in the XUV . . . . .	63
<b>MO11</b>	Large scale CIV3 calculations of fine-structure energy levels and lifetimes in Co XV . . . . .	64
<b>MO12</b>	Fine-structure energy levels and radiative rates for transitions in Mg-like Copper . . . . .	65
<b>MO13</b>	A new method for determining minute long lifetimes of metastable levels . . . . .	66
<b>MO14</b>	Theoretical and Experimental Study of Polarization Spectroscopy of Rubidium Atoms . . . . .	67
<b>MO15</b>	New data, spin-orbit functions, and potential energy curves for the A <sup>1</sup> Σ <sub>u</sub> <sup>+</sup> and b <sup>3</sup> Π <sub>0u</sub> states of Cs <sub>2</sub> and Rb <sub>2</sub> . . . . .	68
<b>MO16</b>	Laser Spectroscopy of Exotic Helium Isotopes . . . . .	69
<b>MO17</b>	Assignment of the RbCs 2 <sup>3</sup> Π <sub>0</sub> , 2 <sup>3</sup> Π <sub>1</sub> , and 3 <sup>3</sup> Σ <sub>1</sub> <sup>+</sup> states and perturbations . . . . .	70
<b>MO18</b>	Light interactions in Rydberg ensembles . . . . .	71
<b>MO19</b>	Theoretical study of the hyperfine structure and isotope shifts in near-infrared transitions of atomic nitrogen . . . . .	72
<b>MO20</b>	Two-photon spectroscopy of <sup>88</sup> Sr . . . . .	73
<b>MO21</b>	Absolute absorption on the rubidium D lines: comparison between theory and experiment . . . . .	74

---

Table of Contents

---

<b>MO22</b>	Optical pumping effect on the magnetic field dependent intensity of hyperfine split D <sub>1</sub> , D <sub>2</sub> lines of <sup>85</sup> Rb and <sup>87</sup> Rb . . . . .	75
<b>MO23</b>	Saturation spectroscopy of the 372 nm Fe I resonance line with laser diode radiation . . . . .	76
<b>MO24</b>	Potassium ground state scattering parameters and Born-Oppenheimer potentials from molecular spectroscopy . . . . .	77
<b>MO25</b>	Tomography of a cold molecular beam via cavity-enhanced direct frequency comb spectroscopy . . . . .	78
<b>MO26</b>	Analytic Solutions for the Saturated Absorption Spectra at low intensity	79

**Atomic Clocks**

<b>MO27</b>	Cold Atoms Microwave Frequency Standards in Brazil . . . . .	80
<b>MO28</b>	Investigation of the optical transition in the <sup>229</sup> Th nucleus: Solid-state optical frequency standard and fundamental constant variation . . . . .	81
<b>MO29</b>	Trapped Atom Clock on a Chip . . . . .	82
<b>MO30</b>	Spin squeezing on the Cs clock transition by QND measurements in a cold atomic ensemble . . . . .	83
<b>MO31</b>	Reducing Clock Projection Noise with Measurement-Induced Correlations . . . . .	84
<b>MO32</b>	Progress toward Sr Optical Lattice clock at NICT and Vapor Cell Measurement of <sup>88</sup> Sr 5s <sup>2</sup> <sup>1</sup> S <sub>0</sub> → 5s5p <sup>3</sup> P <sub>1</sub> Collision Shifts . . . . .	85
<b>MO33</b>	Optical Lattice Clocks with Single Occupancy Bosons and Spin-Polarized Fermions . . . . .	86

**Atoms in External Fields**

<b>MO34</b>	Laser-cooled atoms coupled to a magnetic micro-cantilever . . . . .	87
<b>MO35</b>	Microwave Power Measurements Using Rabi Oscillations . . . . .	88
<b>MO36</b>	Quantum optics near surfaces . . . . .	89
<b>MO37</b>	Realization of localized Bohr-like wavepackets . . . . .	90
<b>MO38</b>	Earth-Field Self Oscillating Magnetometer . . . . .	91
<b>MO39</b>	High-duty cycle magnetometry with cold atoms in dark optical tweezers	92
<b>MO40</b>	Magneto-optical Resonances in Atomic Rubidium in Ordinary and Extremely Thin Cells . . . . .	93
<b>MO41</b>	Error estimation for the generalized Dykhne-Davis-Pechukas approach	94
<b>MO42</b>	Controlling ultracold Rydberg atoms in the quantum regime . . . . .	95
<b>MO43</b>	F-Resolved Magneto-optical Resonances in Atomic Cesium at D1 Excitation . . . . .	96
<b>MO44</b>	Outcoupling of Cold Atoms by Finite-line-width Radio Frequency Field	97
<b>MO45</b>	Fractional resonances of the $\delta$ -kicked accelerator . . . . .	98
<b>MO46</b>	One-Dimensional Rydberg Gas in a Magnetoelectric Trap . . . . .	99
<b>MO47</b>	Optical field Induced Faraday Rotation at Geophysical Magnetic fields: Role of Electromagnetically Induced Transparency . . . . .	100
<b>MO48</b>	A multichannel second-order gradiometer for cardiomagnetic field imaging . . . . .	101
<b>MO49</b>	Nonlinear Faraday Effect for magnetometric applications . . . . .	102

---

Table of Contents

---

<b>MO50</b>	Precision Computation of High Resolving Spectrum Near Ionization Threshold . . . . .	103
<b>MO51</b>	Efficient broadband de-excitation of Rydberg atoms with half-cycle pulses . . . . .	104
<b>MO52</b>	Magnetic interactions of cold atoms with anisotropic conductors . . . . .	105
<b>MO53</b>	Level-crossing transition between mixed states . . . . .	106
<b>Optical Lattices</b>		
<b>MO54</b>	Dark dynamic acousto-optic ring lattices for cold atoms . . . . .	107
<b>MO55</b>	Non-equilibrium quantum dynamics of bosonic atoms in an optical lattice . . . . .	108
<b>MO56</b>	Coherent delocalization of matter waves in driven lattice potentials: a new tool to engineer quantum transport over macroscopic distances . . . . .	109
<b>MO57</b>	Coherent Dynamics of BECs in Periodically Driven Optical Lattice . . . . .	110
<b>MO58</b>	Coherence modulation at quantum resonances of $\delta$ -kicked rotor . . . . .	111
<b>MO59</b>	Andreev-like reflections and metastable many-body states with cold atoms in optical lattices . . . . .	112
<b>MO60</b>	Bragg spectroscopy of cold atom gases in optical lattices . . . . .	113
<b>MO61</b>	Towards Studying Quantum Spin Systems with Ultracold Bosons in an Optical Lattice . . . . .	114
<b>MO62</b>	Observing time reversal in accelerated optical lattices dressed by amplitude modulation . . . . .	115
<b>MO63</b>	Interacting bosons in an optical lattice . . . . .	116
<b>MO64</b>	Staggered-vortex superfluid in an optical lattice . . . . .	117
<b>MO65</b>	Mesoscopic Aspects of Strongly Interacting Cold Atoms . . . . .	118
<b>MO66</b>	Quantum dynamics of matter wave emission in optical lattices . . . . .	119
<b>MO67</b>	Soliton in a lattice emerging from quantum mechanics . . . . .	120
<b>MO68</b>	Robust quantum phases via three-body recombination . . . . .	121
<b>MO69</b>	A quantum gas microscope for the simulation of condensed matter systems . . . . .	122
<b>MO70</b>	Numerical study of Bose-Fermi mixtures in a 3D optical lattice based on the Gutzwiller approximation . . . . .	123
<b>MO71</b>	Pump-probe spectroscopy of 1D and 2D optical lattices . . . . .	124
<b>MO72</b>	Resonant Feshbach scattering of fermions in one-dimensional optical lattices . . . . .	125
<b>MO73</b>	Self-trapping of Bose-Einstein condensates in shallow optical lattices .	126
<b>MO74</b>	Quantum Phases and Quantum Information of Interacting Atomic Gases in Optical Lattices . . . . .	127
<b>MO75</b>	Ground States of Cold Neutral Fermions in 2-Dimensional Optical Lattices: Effects of Strong Correlation in Square and Triangular Lattices	128
<b>MO76</b>	Experimental demonstration of single site addressability in a 2D optical lattice with 600 nm period . . . . .	129
<b>MO77</b>	Asymmetric Landau-Zener tunnelling and non-exponential decay in a periodic potential . . . . .	130
<b>MO78</b>	Flat-top Beams for a Homogeneous Optical Lattice . . . . .	131

Table of Contents

---

<b>MO79</b>	All-optical 3D atomic loops generated with Bessel light fields . . . . .	132
<b>MO80</b>	Interacting Mixtures of Bosons and Fermions in an Optical Lattice . .	133
<b>MO81</b>	Preparing and Detecting Quantum States with Ultracold Atoms in an Optical Superlattice . . . . .	134
<b>MO82</b>	Atom Interferometry with an Optical Lattice . . . . .	135
<b>MO83</b>	Simulating Relativistic Physics with Ultracold Atoms . . . . .	136

**Quantum Information**

<b>MO84</b>	Multiplexed quantum repeater . . . . .	137
<b>MO85</b>	Single Photon Nonlinearity in Cold Polar Molecular Arrays . . . . .	138
<b>MO86</b>	Progress Towards Spin - Photon Entanglement Using NV Centers in Diamond . . . . .	139
<b>MO87</b>	Few-qubit quantum registers encoded in alkaline-earth atoms trapped in an optical lattice . . . . .	140
<b>MO88</b>	Quantum Repeater based on Atomic Ensembles . . . . .	141
<b>MO89</b>	Optimized planar Penning traps for quantum information processing .	142
<b>MO90</b>	Anyonic interferometry and protected memories in atomic spin lattices	143
<b>MO91</b>	Mapping photonic entanglement into and out of a quantum memory .	144
<b>MO92</b>	Quantum phase gates with polar molecules in an optical lattice . . . .	145
<b>MO93</b>	Simultaneous measurements in quantum optics . . . . .	146
<b>MO94</b>	High-Fidelity Readout of Trapped-Ion Qubits . . . . .	147
<b>MO95</b>	Two-boson correlations in various quantum traps . . . . .	148
<b>MO96</b>	Coherent control of electron-nuclear spin qubit registers . . . . .	149
<b>MO97</b>	Robust Generation of Superposition States . . . . .	150
<b>MO98</b>	Studying the Rydberg blockade with individually trapped single atoms in optical tweezers . . . . .	151
<b>MO99</b>	Controlled Creation of Spatial Superposition States for Single Atoms .	152
<b>MO100</b>	Entangling single trapped atoms and ions . . . . .	153
<b>MO101</b>	Breaking the dipole blockade: Nearly-resonant dipole interactions in few-atom systems . . . . .	154
<b>MO102</b>	Towards controlled interactions with individual atoms: Detecting near- est neighbors in an optical lattice and controlled atom-field coupling in an optical cavity . . . . .	155

**Quantum Optics & Cavity QED**

<b>MO103</b>	Threshold three photon resonance in Zeeman transitions . . . . .	156
<b>MO104</b>	Few-photon photon nonlinear optics with cold atoms inside a hollow core fiber . . . . .	157
<b>MO105</b>	Entanglement in the adiabatic limit of cavity QED with pairs of atoms	158
<b>MO106</b>	Teleportation of resonance fluorescence: bandwidth and squeezing re- quirements . . . . .	159
<b>MO107</b>	Dicke-Bose-Hubbard model . . . . .	160
<b>MO108</b>	Coherent Control of One Atom Strongly Coupled to an Optical Cavity	161
<b>MO109</b>	Generating single-photon nonlinearities and strongly correlated pho- tonic states using nanoscale optical waveguides . . . . .	162

Table of Contents

<b>MO110</b>	Strongly correlated photon transport in nonlinear optical fiber . . . . .	163
<b>MO111</b>	Cavity QED with ion Coulomb crystals . . . . .	164
<b>MO112</b>	Novel systems for single-photon generation using quantum memory .	165
<b>MO113</b>	Interference in the light emitted by a single tunneling atom . . . . .	166
<b>MO114</b>	Fast Excitation of a Coupled Atom-Cavity System . . . . .	167
<b>MO115</b>	Atomic qubit detection in the strong coupling regime . . . . .	168
<b>MO116</b>	Engineering the EIT optical response of a five level atom via two ground state RF transitions . . . . .	169
<b>MO117</b>	Non-Markovian quantum jumps . . . . .	170
<b>MO118</b>	Storage and resonance retrieval of optical superposition states in an atomic medium . . . . .	171
<b>MO119</b>	Coherent magnetic resonance spectroscopy of atomic hydrogen gas .	172
<b>MO120</b>	Spectral properties of systems exhibiting intrinsic optical bistability .	173
<b>MO121</b>	Control of the Atom-Cavity Coupling Constant with a Nanopore Lattice in the Cavity-QED Microlaser . . . . .	174
<b>MO122</b>	From a Single-Photon Source to a Single-Ion Laser . . . . .	175
<b>MO123</b>	Strong magnetic coupling between an electronic spin qubit and a mechanical resonator . . . . .	176
<b>MO124</b>	Interaction between neutral atoms and superconducting surfaces . . . .	177
<b>MO125</b>	Strong coupling of single optical emitters to nano-scale surface plasmons	178
<b>MO126</b>	Single-Photon Bus between Spin-Wave Quantum Memories . . . . .	179
<b>MO127</b>	Single Atom and Photon Interactions Using a Toroidal Microresonator: A Photon Turnstile . . . . .	180
<b>MO128</b>	Protecting entanglement via the quantum Zeno effect . . . . .	181
<b>MO129</b>	Polarity manipulation of Atom-Cavity Coupling Constant in the Cavity-QED Microlaser . . . . .	182
<b>MO130</b>	Coherent Manipulation of Single Atoms in Cavity QED . . . . .	183
<b>MO131</b>	Restoring the wave function with Cavity QED of single Yb atoms .	184
<b>MO132</b>	Precessing magnon as a heralded quantum memory for photon polarization states . . . . .	185
<b>MO133</b>	Observation of atom-cavity interaction with cold single atoms with various coupling constants . . . . .	186
<b>MO134</b>	Dynamical Casimir Effect for Two Oscillating Mirrors in 3-D . . . .	187

**Poster Session II: Tuesday, July 29, 4:15 pm – 6:00 pm**

**Precision Measurements and Fundamental Constants**

<b>TU1</b>	A Supersonic Gas Jet Seeded with Tungsten Atoms . . . . .	190
<b>TU2</b>	Search for the electron’s electric dipole moment with cold ThO molecules	191
<b>TU3</b>	Dispelling the curse of the neutron skin in atomic parity violation .	192
<b>TU4</b>	Characterization of an high precision cold atom gyroscope . . . .	193
<b>TU5</b>	Light shift of the 6S-8S two-photon transition in cesium . . . .	194
<b>TU6</b>	Precise Measurement of the Isotope Shift of the Lithium D Lines .	195
<b>TU7</b>	Measurement of Femtosecond Laser Comb Frequency Offset Using Fabry-Perot Interferometer . . . . .	196

Table of Contents

<b>TU8</b>	Nuclear Spin Dependent Parity Non-Conservation in Diatomic Molecules	197
<b>TU9</b>	A New Search for a Spin-Gravity Interaction . . . . .	198
<b>TU10</b>	The YbF electron electric dipole moment measurement: Data aquisition and analysis. . . . .	199
<b>TU11</b>	Antihydrogen Production in a Penning-Ioffe Trap . . . . .	200
<b>TU12</b>	Possible Constraints on Time-Dependence in the Speed of Light from Lunar Laser Ranging . . . . .	201
<b>TU13</b>	Towards a Beta Asymmetry Measurement of Polarized Radioactive Atoms in an Optical Dipole Trap . . . . .	202
<b>TU14</b>	An Atom Interferometer for Gradient Magnetometry . . . . .	203
<b>TU15</b>	Using Feshbach resonance to observe variation of fundamental constants in ultracold atomic and molecular gases . . . . .	204
<b>TU16</b>	Bloch oscillations in an optical lattice: a tool for high precision measurements . . . . .	205
<b>TU17</b>	Single-Proton Self-Excited Oscillator . . . . .	206
<b>TU18</b>	Nanoscale magnetic sensing with an individual electronic spin in diamond . . . . .	207
<b>TU19</b>	The YbF electron electric dipole moment measurement: diagnostics and systematics . . . . .	208
<b>TU20</b>	Progress on a New Search for the Permanent Electric Dipole Moment (EDM) of $^{199}\text{Hg}$ . . . . .	209
<b>TU21</b>	Search for an electron EDM with molecular ions . . . . .	210
<b>TU22</b>	A mobile atom interferometer for high precision measurements of local gravity . . . . .	211
<b>TU23</b>	Electric Dipole Moments as Alternative Probes for Finding New Physics Beyond Standard Model . . . . .	212
<b>TU24</b>	Measurement of the Rb D2 Transition Linewidth at Ultralow Temperature . . . . .	213
<b>TU25</b>	A cold atom gravimeter for onboard applications . . . . .	214
<b>TU26</b>	Precision spectroscopy of $^3\text{He}$ at 1083 nm . . . . .	215
<b>TU27</b>	Recent Results from the PbO* Electron EDM Experiment . . . . .	216
<b>TU28</b>	Precise measurements of hyperfine structure and atomic polarizability in indium and thallium . . . . .	217
<b>TU29</b>	Seeking More Accurate Measurements of the Electron and Positron Magnetic Moments . . . . .	218
<b>TU30</b>	Experiment to search for electron electric dipole moment using laser-cooled Cs atoms . . . . .	219
<b>TU31</b>	Long Arm With Large Separation Atom Interferometers . . . . .	220
<b>TU32</b>	News from the Muonic Hydrogen Lamb Shift Experiment . . . . .	221
<b>TU33</b>	Many-Atom Correlated States Produced via Cavity-Enhanced Nonde-molition Measurement . . . . .	222
<b>TU34</b>	Progress toward a measurement of the $^{225}\text{Ra}$ atomic electric dipole moment . . . . .	223
<b>TU35</b>	Elimination of non-linear Zeeman splitting using AC Stark shifts . . . . .	224

---

Table of Contents

---

- TU36** Measurement of the Quadratic Zeeman Shift of  $^{85}\text{Rb}$  Hyperfine Sublevels in a Cold Atom Interferometer . . . . . 225

**Atomic Interactions and Collisions**

- TU37** New analytical relativistic formula for X-ray and gamma-ray Rayleigh scattering by K-shell electrons . . . . . 226
- TU38** Renormalization and Universality of Van der Waals Forces . . . . . 227
- TU39** Mechanical effect of photoassociation for metastable atoms: a new method to measure the scattering length . . . . . 228
- TU40** Broadening and Shifts of Autoionizing Series of Barium Induced by Rare Gas Collisions . . . . . 229
- TU41** Elastic Electron Scattering by Antimony Atom . . . . . 230
- TU42** A radio-frequency assisted d-wave Feshbach resonance in the strong field regime . . . . . 231
- TU43** An atomic Fresnel biprism interferometer. . . . . 232
- TU44** Cold Collision Shift of Magnetic Resonance in Atomic Hydrogen Gas 233
- TU45** Theoretical study of an excitation blockade in ultracold Rydberg gases 234
- TU46** Towards thermal equilibrium of atomic polariton states . . . . . 235
- TU47** Charge Transfer Between Cold Atoms and Ions . . . . . 236
- TU48** Inelastic Collisions in the Metastable  $^3P_0$   $^3P_2$  States of  $^{88}\text{Sr}$  . . . . . 237
- TU49** Theoretical Investigations on Ion-Atom collision . . . . . 238
- TU50** Study of the Rydberg state excitation of few cold Rb atoms in a dipole trap . . . . . 239
- TU51** Magnetic trapping and anomalous inelastic collisions in the few-partial-wave regime . . . . . 240
- TU52** Coherent Control of Ultracold Collisions with Nonlinear Frequency Chirps on the Nanosecond Timescale . . . . . 241
- TU53** Energy Relaxation in Collisions of Atomic Particles . . . . . 242
- TU54** Generation of Nanosecond-Scale Frequency-Chirped Pulses with Fiber-Based Phase and Amplitude Modulators . . . . . 243
- TU55** Photoassociation spectroscopy of cold metastable neon . . . . . 244
- TU56** Long-range Wells in Rydberg-Rydberg Potential Curves . . . . . 245
- TU57** The Role of Scattering Length in Ultracold Interactions of Bose-Einstein Condensation . . . . . 246
- TU58** Interaction phenomena in ultracold Rydberg gases . . . . . 247
- TU59** Series of doubly-excited states  $^1\text{S}^e$  of  $\text{Li}^+$  below the N=2 threshold of  $\text{Li}^{2+} *$  . . . . . 248
- TU60** Cold Titanium-Helium Collisions . . . . . 249
- TU61** Inelastic Titanium-Titanium Collisions . . . . . 250
- TU62** Laboratory Astrophysics: Simulation of Cometary X-ray Spectra from Collisions of keV He-like O, N and Ne ions with Gases . . . . . 251
- TU63** Quantum reflection of helium atom beams from a microstructured grating . . . . . 252
- TU64** Spinor Dynamics in an Antiferromagnetic Condensate . . . . . 253

---

Table of Contents

---

**Cooling and Trapping**

<b>TU65</b>	Investigation of the energy distribution and cooling of a single atom in an optical tweezer . . . . .	254
<b>TU66</b>	Progress on a Helium Slower for MOT Loading using the Bichromatic Force . . . . .	255
<b>TU67</b>	A new BEC experiment at the University of Cambridge . . . . .	256
<b>TU68</b>	Resonance fluorescence spectrum of a single neutral trapped atom in strong Lamb-Dicke regime . . . . .	257
<b>TU69</b>	Cavity cooling of $^{88}\text{Sr}^+$ . . . . .	258
<b>TU70</b>	Progress towards a buffer gas cooled BEC of metastable He . . . . .	259
<b>TU71</b>	Cold electron beams from trapped atoms . . . . .	260
<b>TU72</b>	Solid-state laser source at 589 nm for laser cooling of Sodium . . . . .	261
<b>TU73</b>	Superconducting atom-chip for groundstate and Rydberg atoms . . . . .	262
<b>TU74</b>	Imaging magnetic fields using velocity selective resonances in cold atom clouds . . . . .	263
<b>TU75</b>	Towards sympathetic cooling of a Bose-Fermi mixture . . . . .	264
<b>TU76</b>	Entropy Exchange in Laser Cooling* . . . . .	265
<b>TU77</b>	Neutral Atom Lithography Using a Bright Metastable Helium Beam* .	266
<b>TU78</b>	Infrared Spectroscopy of Magneto-optically Trapped Calcium Atoms .	267
<b>TU79</b>	Theoretical analysis of trapped atom interferometers using laser cooled sources . . . . .	268
<b>TU80</b>	Light-shift tomography in an optical-dipole trap . . . . .	269
<b>TU81</b>	Hyperfine Pumping Resonance for Sub-Doppler Cooling in $^{87}\text{Rb}$ . . . . .	270
<b>TU82</b>	Trapped-Atom Cooling Beyond The Lamb-Dicke Limit Using Electromagnetically-Induced Transparency . . . . .	271
<b>TU83</b>	Multichamber vacuum system for atom interferometry . . . . .	272
<b>TU84</b>	Intense Cold Atom Source . . . . .	273
<b>TU85</b>	High power second harmonic generation of 514.5 nm light in PPMgLN	274
<b>TU86</b>	Comparison of laser cooling and trapping of even and odd calcium isotopes . . . . .	275
<b>TU87</b>	Low energy-spread ion beams from a trapped atomic gas . . . . .	276
<b>TU88</b>	Precise measurement of intensity correlation function for resonance fluorescence from an optical molasses . . . . .	277
<b>TU89</b>	Towards a Li-Rb Ring Interferometer . . . . .	278
<b>TU90</b>	Adjustable microchip ringtraps for cold atoms and molecules. . . . .	279
<b>TU91</b>	Output coupling solution for magnetically trapped spinor condensates .	280
<b>TU92</b>	Trapping hydrogen atoms in a neon-gas matrix: A theoretical simulation	281
<b>TU93</b>	Near-field Diffraction Optical Microtraps for Atoms . . . . .	282
<b>TU94</b>	Ultra cold atoms in Parametrically driven magnetic potentials . . . . .	283
<b>TU95</b>	Novel Coherent Optical Medium Based on Buffer-Gas-Cooled Rb Vapor	284
<b>TU96</b>	Trapping Atoms in the Vicinity of a Persistent Supercurrent Atom Chip	285
<b>TU97</b>	Absolute frequency stabilisation of a laser to ions in a discharge . . . . .	286
<b>TU98</b>	Double U-type Magneto-optical Trap on an Atom Chip . . . . .	287
<b>TU99</b>	Laser Cooling and Trapping of Barium . . . . .	288

---

Table of Contents

---

<b>TU100</b>	AC electric trapping of Rb atoms . . . . .	289
<b>TU101</b>	A Cigar-Shaped Cold Atom Cloud in the MOT with Large Optical Density . . . . .	290

**Fermi Gases**

<b>TU102</b>	Collective Excitations of Trapped Imbalanced Fermion Gases . . . . .	291
<b>TU103</b>	Trapped Phase-Segregated Bose-Fermi Mixtures and their Collective Excitations . . . . .	292
<b>TU104</b>	BEC as a Tool for Quantum Measurement . . . . .	293
<b>TU105</b>	Bragg Spectroscopy of a Strongly Interacting Fermi Gas . . . . .	294
<b>TU106</b>	Bose-Fermi Mixtures on an Atom Chip . . . . .	295
<b>TU107</b>	Finite temperature dynamics of a strongly interacting ultracold Fermi gas. . . . .	296
<b>TU108</b>	Using photoemission spectroscopy to probe a strongly interacting Fermi gas . . . . .	297
<b>TU109</b>	Superfluid phase transition in the unitarity limit . . . . .	298
<b>TU110</b>	p-wave Feshbach Molecules of $^6\text{Li}_2$ . . . . .	299
<b>TU111</b>	The Interacting Fermi-Fermi Mixture of $^6\text{Li}$ and $^{40}\text{K}$ . . . . .	300
<b>TU112</b>	Realization of a Spin-1 Fermi Gas . . . . .	301
<b>TU113</b>	Monte Carlo simulation of an inhomogeneous two-component p-wave interacting Fermi gas . . . . .	302
<b>TU114</b>	Many-body physics with ultracold atomic fermions . . . . .	303
<b>TU115</b>	Mixture of a Spin-Polarized Fermi Gas in a box . . . . .	304
<b>TU116</b>	Feshbach Resonances in Ultracold Lithium Rubidium Mixtures . . . . .	305
<b>TU117</b>	BEC-BCS Crossover in ultracold $^6\text{Li}$ Fermi gas : a new experimental setup . . . . .	306
<b>TU118</b>	Population Imbalanced Two-component Fermi Superfluidity inside Box-shape Trap: Self-consistent Calculations of $T = 0$ BdG Equation . . . . .	307
<b>TU119</b>	Large Wave Mechanical Simulations of Interacting Fermi Atoms . . . . .	308
<b>TU120</b>	Towards a Finite Ensemble of Ultracold Fermions . . . . .	309
<b>TU121</b>	Effect of disorder on one-dimensional fermions in an optical lattice . . . . .	310
<b>TU122</b>	An ultracold fermion mixture of $^6\text{Li}$ and $^{40}\text{K}$ . . . . .	311
<b>TU123</b>	Preparation of a three-component degenerate Fermi gas . . . . .	312
<b>TU124</b>	Quadrupole Oscillation in the Bose-Fermi Mixtures in the Time-Dependent Approach . . . . .	313

**Mesoscopic Quantum Systems**

<b>TU125</b>	Resolved-sideband cooling of a micromechanical oscillator . . . . .	314
<b>TU126</b>	Demonstration of Ultra-Low Dissipation Optomechanical Resonators on a Chip . . . . .	315
<b>TU127</b>	Ultracold atoms coupled to micro- and nanomechanical resonators on an atom chip . . . . .	316
<b>TU128</b>	Schrödinger cat states in rotating ultra-cold atoms . . . . .	317
<b>TU129</b>	Mesoscopic Dipolar Crystals of Rydberg-Dressed Atoms . . . . .	318

Table of Contents

<b>TU130</b>	Non-equilibrium suppression of electron spin dephasing in quantum dots . . . . .	319
<b>TU131</b>	Improved Phonon QND Readout Using Degenerate Cavity Modes . . . . .	320
<b>TU132</b>	Sagnac Effect in an Array of Electron Matter Wave Interferometers . . . . .	321
<b>TU133</b>	Cooling and detecting nanomechanical motion with a microwave cavity	322
<b>TU134</b>	Observation of Bogoliubov excitations in exciton-polariton condensates	323
<b>TU135</b>	‘Trapped Rainbow’ in Graphene . . . . .	324

**Poster Session III: Thursday, July 31, 4:15 pm – 6:00 pm**

**Bose Gases**

<b>TH1</b>	Large magnetic storage ring and beamsplitter for BECs . . . . .	326
<b>TH2</b>	Observation of a 2D Bose-gas: from thermal to quasi-condensate to superfluid . . . . .	327
<b>TH3</b>	Theory of Bose-Einstein condensate interferometry . . . . .	328
<b>TH4</b>	All-optical production of chromium Bose-Einstein Condensates. . . . .	329
<b>TH5</b>	Quasi-2D Bose Einstein condensation of Cooper pairs and high $T_c$ superconductivity . . . . .	330
<b>TH6</b>	Bragg scattering from a Bose-Einstein condensate near a Feshbach resonance . . . . .	331
<b>TH7</b>	Numerical Investigation of Contrast Degradation of BEC Interferometer	332
<b>TH8</b>	Yang-Yang Thermodynamics on an Atom Chip . . . . .	333
<b>TH9</b>	Coherent modes excitation by modulation of interaction in a BEC . . . . .	334
<b>TH10</b>	Vortices formation by oscillatory excitation of a BEC . . . . .	335
<b>TH11</b>	Corrections to Thomas-Fermi approximation for finite temperature condensate:theory and experiment . . . . .	336
<b>TH12</b>	A Smooth, Inductively Coupled Ring Trap for Atoms . . . . .	337
<b>TH13</b>	Formation of vortices in a dense Bose-Einstein condensate . . . . .	338
<b>TH14</b>	Experiments on Bose-Einstein Condensate of $^{87}\text{Rb}$ in Finite Temperatures . . . . .	339
<b>TH15</b>	Double species Bose-Einstein condensate with tunable interspecies interactions . . . . .	340
<b>TH16</b>	All-optical production of $^7\text{Li}$ Bose-Einstein condensation using Feshbach resonances . . . . .	341
<b>TH17</b>	Resolving and Addressing Spin-1 BECs in Individual Sites of a $\text{CO}_2$ -laser Optical Lattice . . . . .	342
<b>TH18</b>	Towards Dual BEC: Zeeman slower approach . . . . .	343
<b>TH19</b>	Generating Nonclassical States in Atom-Optics via Self Interaction. . . . .	344
<b>TH20</b>	The cranked-Hartree-Fock-Bogoliubov description for Fragmented Bose-Einstein Condensates . . . . .	345
<b>TH21</b>	Quantum Brownian Motion in a Bose-Einstein Condensate . . . . .	346
<b>TH22</b>	Guided-wave atom interferometer with mm-scale arm separation . . . . .	347
<b>TH23</b>	Three-dimensional character of atom-chip-based rf-dressed potentials .	348
<b>TH24</b>	Bragg Spectroscopy of a Strongly Interacting $^{85}\text{Rb}$ Bose-Einstein Condensate . . . . .	349

---

Table of Contents

---

<b>TH25</b>	A High Flux Atom Laser for Interferometry . . . . .	350
<b>TH26</b>	Cleaning of magnetic substates in an optical dipole trap . . . . .	351
<b>TH27</b>	First Determination of the Helium $2^3P_1 - 1^1S_0$ Transition Rate . . . . .	352
<b>TH28</b>	Single mode guiding of an atom laser beam . . . . .	353
<b>TH29</b>	Dynamics of a BEC in a 3D double-well potential . . . . .	354
<b>TH30</b>	First realization of Bose-Einstein condensation in microgravity . . . . .	355
<b>TH31</b>	Universality of Bose-Einstein condensation of weakly interacting multi-component atomic gas close to high symmetry point . . . . .	356
<b>TH32</b>	Towards thermal melting of a vortex lattice in a rotating 2D BEC . . . . .	357
<b>TH33</b>	Creating a supersolid in one-dimensional Bose mixtures . . . . .	358
<b>TH34</b>	Toward sub-shot-noise fluctuations in coherently split quantum degenerate gases . . . . .	359
<b>TH35</b>	Condition for Dynamical Instability of a Trapped Bose-Einstein Condensate with a Highly Quantized Vortex . . . . .	360
<b>TH36</b>	Controlled deflection of cold atomic clouds and of Bose-Einstein condensates . . . . .	361
<b>TH37</b>	Equilibrium phases of a dipolar spinor Bose gas . . . . .	362
<b>TH38</b>	Fractional Quantum Hall Physics with Rotating Few-Body Bose Clusters	363
<b>TH39</b>	A pumped atom laser . . . . .	364
<b>TH40</b>	Tailoring Motional States of Strongly Interacting 2D Bose-Einstein Condensates: Creation of Vortices and Antivortices . . . . .	365
<b>TH41</b>	A dual-species BEC with tunable interactions . . . . .	366
<b>TH42</b>	Mind the gap in Raman scattering of a Bose gas ! . . . . .	367
<b>TH43</b>	Feshbach Resonances in Bose-Fermi Cr Gas Mixtures . . . . .	368
<b>TH44</b>	Hydrodynamic excitations in a Bose-Einstein condensate . . . . .	369
<b>TH45</b>	Atom Interferometry with Interacting Bose-Einstein Condensates . . . . .	370
<b>TH46</b>	Virial expansion for ultracold trapped fluids and the exactness of the local density approximation . . . . .	371
<b>TH47</b>	Dynamical evolution of an interacting Bose gas at low temperatures described through a quantum kinetic equation . . . . .	372
<b>TH48</b>	Evolution and Measurement of Relative Phase in a Two-Component Bose-Einstein Condensate . . . . .	373
<b>TH49</b>	Inelastic collision dynamics of $^{87}\text{Rb}$ spin-2 Bose-Einstein Condensates	374
<b>TH50</b>	Optical Traps for ultracold metastable helium atoms . . . . .	375
<b>TH51</b>	Weightless Bose-Einstein Condensates . . . . .	376
<b>TH52</b>	State selective single atom detection on a magnetic microchip . . . . .	377
<b>TH53</b>	Bosonic Tonks-Girardeau Gases in a Split Trap . . . . .	378
<b>TH54</b>	Vortex nucleation and non-equilibrium dynamics in a Bose-Einstein condensate at finite temperatures . . . . .	379
<b>TH55</b>	Quantum Fluctuation Effect in Dynamical Instability of Bose-Einstein Condensate with a Highly Quantized Vortex . . . . .	380
<b>TH56</b>	Rydberg excitation of a Bose-Einstein condensate . . . . .	381
<b>TH57</b>	A high flux source of magnetically guided ultracold chromium atoms .	382
<b>TH58</b>	Controlled entanglement of spin and motional state of a Bose-Einstein condensate on a microwave atom chip . . . . .	383

---

Table of Contents

---

<b>TH59</b>	The splitting two-fluid hydrodynamic equations for Bose-Einstein condensate . . . . .	384
<b>TH60</b>	Effect of various time dependent longitudinal traps on Bose-Einstein condensate . . . . .	385
<b>TH61</b>	Noise and correlation measurements using single atom detection . . . . .	386
<b>TH62</b>	Bose Condensates with Small <i>s</i> -wave Scattering Lengths: Effect of Dipolar Interaction . . . . .	387
<b>TH63</b>	Holographic Storage of Multiple Coherence Gratings . . . . .	388
<b>TH63</b>	in a Bose-Einstein Condensate . . . . .	388
<b>Cold Molecules</b>		
<b>TH64</b>	Gross-Pitaevskii equation for a BEC of polarized molecules: anisotropic mass . . . . .	389
<b>TH65</b>	Feshbach Resonances in ultracold $^{40}\text{K} + ^{87}\text{Rb}$ mixture . . . . .	390
<b>TH66</b>	Singly excited doublet $^7\text{Li}_2 + ^7\text{Li}$ potential energy surface for the formation of ultracold trimers . . . . .	391
<b>TH67</b>	Two-photon femtosecond photoassociation – better perspectives for coherent control? . . . . .	392
<b>TH68</b>	Spectroscopy of Ultracold $^{41}\text{K}^{87}\text{Rb}$ Molecules using Resonance Enhanced 2-photon Ionization . . . . .	393
<b>TH69</b>	Time-Domain Measurement of Spontaneous Vibrational Decay of Magnetically Trapped NH . . . . .	394
<b>TH70</b>	A High Flux Continuous Source of Guided Polar Molecules . . . . .	395
<b>TH71</b>	Microwave Trapping of Buffer Gas Cooled Molecules . . . . .	396
<b>TH72</b>	Towards Ultracold Mixtures and Molecules of Lithium and Ytterbium Atoms . . . . .	397
<b>TH73</b>	Ultracold Production and trapping of ultracold RbCs molecules . . . . .	398
<b>TH74</b>	Repulsive shield between polar molecules . . . . .	399
<b>TH75</b>	Magnetic trapping of atomic nitrogen ( $^{14}\text{N}$ ) and cotrapping of NH ( $X^3\Sigma^-$ ) . . . . .	400
<b>TH76</b>	Photoassociation of ultracold LiCs molecules . . . . .	401
<b>TH77</b>	Quantum Gas of Deeply Bound Ground State Molecules . . . . .	402
<b>TH78</b>	Trapping Stark decelerated cold molecules . . . . .	403
<b>TH79</b>	Progress Towards Forming Ultracold $^{85}\text{Rb}_2$ Molecules in an Optical Dipole Trap . . . . .	404
<b>TH80</b>	Weakly-bound molecules. Analysis by the Lu-Fano method coupled to the LeRoy-Bernstein model. . . . .	405
<b>TH81</b>	Lifetime of exotic dimers of ultracold metastable helium . . . . .	406
<b>TH82</b>	Formation of deeply bound molecules via chainwise adiabatic passage	407
<b>TH83</b>	Cold Rydberg atom pair excitation in the presence of AC/DC electric fields . . . . .	408
<b>TH84</b>	Rovibrational Dynamics and Photoassociation of Cold Heteronuclear Dimers in Electric Fields . . . . .	409
<b>TH85</b>	Stark deceleration of cold lithium hydride molecules . . . . .	410

---

---

Table of Contents

---

<b>TH86</b>	Dynamics of polar molecules in alternating gradient guides and decelerators . . . . .	411
<b>TH87</b>	A Near Quantum Degenerate Gas of Triplet $v = 0$ Polar Molecules . . . . .	412
<b>TH88</b>	A Simple Model for Feshbach Molecule Bound States . . . . .	413
<b>TH89</b>	Giant formation rates of ultracold molecules via Feshbach Optimized Photoassociation . . . . .	414
<b>TH90</b>	Observation of a Shape Resonance in Cold Ground State Rb <sub>2</sub> Molecule Formation . . . . .	415
<b>TH91</b>	Low-Temperature Collisions Utilizing Trapped OH . . . . .	416
<b>TH92</b>	Nearly degenerate levels in Cs <sub>2</sub> with amplified sensitivity to variation of $\mu = m_e/m_p$ . . . . .	417
<b>TH93</b>	Many-body effects in the production of Feshbach molecules . . . . .	418
<b>TH94</b>	Magnetic Trapping and Zeeman Relaxation of NH Molecules . . . . .	419
<b>TH95</b>	Ultracold Molecules for Precision Measurements . . . . .	420
<b>TH96</b>	Laser-Induced Fluorescence of Metastable He <sub>2</sub> Molecules in Superfluid Helium . . . . .	421

**Trapped Ions**

<b>TH97</b>	Barium Ion Trap Cavity QED . . . . .	422
<b>TH98</b>	The effect of ion beam distribution temperature on lateral spread of implanted ions on a solid target . . . . .	423
<b>TH99</b>	Temperature control of ion beam surface interaction using rf ion trap .	424
<b>TH100</b>	Segmented Ion Traps for Quantum Computing . . . . .	425
<b>TH101</b>	Scalable, efficient ion-photon coupling with phase Fresnel lenses for large-scale quantum computing . . . . .	426
<b>TH102</b>	Fluorescence Imaging of Ultracold Neutral Plasmas . . . . .	427
<b>TH103</b>	Trapped Rydberg Ions: From Spin Chains to Fast Quantum Gates . . . . .	428
<b>TH104</b>	Progress towards distribution of entanglement in an ion trap array . . . . .	429
<b>TH105</b>	Individual addressing of trapped ions and coupling of motional and spin states using rf radiation . . . . .	430
<b>TH106</b>	Observation of the Quadrupole Transition in a single cold <sup>40</sup> Ca <sup>+</sup> . . . . .	431
<b>TH107</b>	Temperature Dependence of Electric Field Noise Above Gold Surfaces	432
<b>TH108</b>	Frequency metrology on a single, trapped ion in the weak binding limit: The $3s_{1/2}$ - $3p_{3/2}$ transition in Mg <sup>+</sup> . . . . .	433
<b>TH109</b>	Observation of Coulomb crystals in a cryogenic linear octupole rf ion trap . . . . .	434
<b>TH110</b>	Cryogenic planar elliptical ion traps for quantum simulation . . . . .	435
<b>TH111</b>	Quantum Information Processing with Ions and Photons . . . . .	436
<b>TH112</b>	Microfabricated segmented ion trap for scalable quantum information science . . . . .	437
<b>TH113</b>	Individual ion addressing using a magnetic field gradient in a surface-electrode ion trap . . . . .	438
<b>TH114</b>	Simulating a quantum magnet with trapped ions . . . . .	439
<b>TH115</b>	Coherence of the metastable qubit in <sup>40</sup> Ca <sup>+</sup> ions . . . . .	440

---

Table of Contents

---

<b>TH116</b>	Robust creation of Dicke states of trapped ions by collective adiabatic passage . . . . .	441
<b>Intense Fields and Ultrafast Phenomena</b>		
<b>TH117</b>	Coherent accumulation effects in the propagation of an ultrashort pulse train . . . . .	442
<b>TH118</b>	Synthesis of Sub-Single-Cycle Optical Pulse Train with Constant Carrier-Envelope Phase . . . . .	443
<b>TH119</b>	Filamentation properties of air with carrier-envelope offset controlled, few cycle light pulses . . . . .	444
<b>TH120</b>	Four-photon ionization of lithium . . . . .	445
<b>TH121</b>	High harmonics generation from excited states of atomic lithium . . . . .	446
<b>TH122</b>	All-fiber, octave-spanning supercontinuum source for versatile wavelength selection and powerful 243nm source . . . . .	447
<b>TH123</b>	New tools for coherent control of light emission . . . . .	448
<b>TH124</b>	Ultrashort Pulse Generation with Zero Carrier Envelope Offset by using Broad Raman Sidebands . . . . .	449
<b>TH125</b>	Orientation-Dependent Behavior of Strong-Field Ionization Rates for Laser-Irradiated Diatomics . . . . .	450
<b>TH126</b>	On Contribution from Inner Molecular Shells to No Suppression in Strong-Field Ionization of $F_2$ . . . . .	451
<b>Other</b>		
<b>TH127</b>	Driven cold atoms as a model system for nonequilibrium dynamics : Dynamic phase transition . . . . .	452
<b>TH128</b>	Femtosecond laser frequency comb for precision astrophysical spectroscopy . . . . .	453
<b>TH129</b>	Photon localization and Dicke superradiance in atomic gases . . . . .	454
<b>TH130</b>	Motion-Induced Resonance: Toward a New Atom Manipulation Technique Using Periodic Structures . . . . .	455
<b>TH131</b>	Dressed Atom Formation by Periodic Crystal Fields . . . . .	456
<b>TH132</b>	Negative Refractive Index Without Absorption . . . . .	457
<b>TH133</b>	Decoherence in molecular wave packet through sub-Planck scale structure . . . . .	458
<b>TH134</b>	Towards a Random Laser with Cold Atoms . . . . .	459
<b>TH135</b>	Laser Spectroscopy of Scandium Isotopes and Isomers . . . . .	460
<b>Funding Agencies</b> . . . . .		463
<b>International Agencies</b> . . . . .		464
<b>Support from the University of Connecticut</b> . . . . .		465
<b>Exhibitors</b> . . . . .		466
<b>Corporate Sponsors</b> . . . . .		467
<b>Author Index</b> . . . . .		468

---