

25th International Conference on Atomic Physics (ICAP2016)

Seoul, Korea
24 - 29 July 2016

ISBN: 978-1-5108-7737-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2016) by Institute of Applied Physics
All rights reserved.

Printed by Curran Associates, Inc. (2019)

For permission requests, please contact Institute of Applied Physics
at the address below.

Institute of Applied Physics
Seoul National University
Building 56-212
1 Gwanak-ro, Gwanak-gu
Seoul 08826
South Korea

Phone: 82-2-880-8515

Fax: 82-2-876-2590

<http://phya.snu.ac.kr/IAP>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

Invited Talks

Monday 25 July, 8:30 am - 8:45 am	
Welcome Remarks	Chair: W. Jhe
Monday 25 July, 8:45 am – 10:15 am	
Plenary Session of Interdisciplinary AMO physics	Chair: E. Hinds
From evaporative cooling and BEC in hydrogen to microscopy innovation in biology	
Harald Hess (45min)	..35
Helium films at ultralow temperatures: from strongly correlated atomically layered films to topological mesoscopic superfluidity.	
John Saunders (45min)	..36
Monday 25 July, 10:40 am - 12:25 pm	
Atomic clocks	Chair: T. Udem
Optical lattice clock and quantum many-body physics	
Jun Ye (45min)	..37
Frequency ratios of optical lattice clocks at the 17th decimal place	
Hidetoshi Katori (30min)	..38
Search for New Physics with Atomic Clocks	
Mariana Safronova (30min)	..39
Monday 25 July, 2:50 pm – 4:05 pm	
Quantum calculation & quantum simulation	Chair: C. Monroe
Quantum magnetism with ultracold fermions	
Randall Hulet (45min)	..40
Many-body quantum phenomena in a dipolar Bose-Einstein condensate of erbium atoms	
Francesca Ferlaino (30min)	..41
Monday 25 July, 4:30 pm - 6:30 pm	
Quantum calculation & quantum simulation	Chair: A. Derevianko
Quantum Computations and Quantum Simulations with Trapped Ca+ Ions	
Rainer Blatt (45min)	..42
Modular Quantum Computers and Quantum Simulators with Trapped Ions	
Chris Monroe (45min)	..43
Hybrid Quantum Information Processing	
Akira Furusawa (30min)	..44

Tuesday 26 July, 8:30 am - 10:15 am

Quantum optics and cavity QED

Chair: X. Chen

- Exploring frontiers of quantum optics with strongly coupled atoms and atom-like systems**
Mikhail Lukin (45min) ..45
- Realizing quantum gates using cavity QED**
Stephan Ritter (30min) ..46
- Spontaneous Spin Squeezing in a Rubidium BEC**
Jakob Reichel (30min) ..47

Tuesday 26 July, 10:40 am - 12:25 pm

Fundamental tests and precision measurement

Chair: B. Das

- Particle Physics with AMO Methods**
Gerald Gabrielse (45min) ..48
- Searching for ultralight dark matter with atomic spectroscopy and magnetic resonance**
Dmitry Budker (30min) ..49
- A Michelson-Morley test for electrons using trapped ions**
Hartmut Haeffner (30min) ..50

Tuesday 26 July, 2:50 pm - 4:05 pm

Intense fields and ultrafast science

Chair: M. Lewenstein

- Ultrafast Atomic and Molecular Dynamics Explored with High Harmonics**
Chang Hee Nam (45min) ..51
- Attosecond electron dynamics on surfaces and layered systems**
Reinhard Kienberger (30min) ..52

Tuesday 26 July, 4:30 pm - 6:35 pm

Hot Topics

Chair: J. Ahn

- Birth of a resonant photoelectron wavepacket**
Luca Argenti (25min) ..54
- Multi-Plate Supercontinuum Generation: New Approach to Single-Cycle Pulses and Isolated Attosecond Pulses**
Andy Kung (25min) ..55
- Spontaneous broadening of a driven dissipative Rydberg system**
Trey Porto (25min) ..56
- Dynamics of strongly interacting atomic Fermi gases**
Giacomo Roati(25min) ..57
- Combining Yb and Li: Feshbach Resonance and dual-species Bose-Fermi Superfluid**
Subhadeep Gupta (25min) ..58

Wednesday 27 July, 8:30 am - 10: 45 am

Rydberg and artificial atoms

Chair: S. Whitlock

Atomic vapor spectroscopy in integrated photonic structures

Tilman Pfau (45min) ..59

Oscillators for quantum information: the cat code, error correction, and two mode entanglement

Robert Schoelkopf (30min) ..60

Rydberg atoms in a cavity

Wu-Ming Liu (30min) ..61

Quantum spin dynamics, coherences and entanglement in trapped ion arrays

Ana Maria Rey Ayala (30min) ..62

Wednesday 27 July, 11:15 am – 11:45 pm

Quantum statistical physics and matter-wave interferometry

Chair: D. Meschede

Advances in airborne and underground atom interferometers

Philippe Bouyer (30min) ..63

Wednesday 27 July, 11:45 am - 12:10 pm

IUPAP C-15 young scientist prize winner

Chair: D. Meschede

Observation of two-species vortex lattices in a mixture of mass-imbalance

Bose and Fermi superfluids

Yuoao Chen (25min) ..64

Thursday 28 July, 8:30 am - 10:15 am

Quantum calculation & quantum simulation

Chair: P. Naidon

- Quantum Gas Microscopy - a Close-Up of Fermions, Entanglement and Quantum Statistical Physics**
Markus Greiner (45min) ..65
- A Quantum-Gas Microscope for Fermionic 40-Potassium**
Stefan Kuhr (30min) ..66
- Deterministic quantum simulators with cold atoms**
Selim Jochim (30min) ..67

Thursday 28 July, 10:40 am - 12:25 pm

Quantum gases

Chair: J. Walraven

- Dynamics of a Bose-Fermi Superfluid Mixture**
Christophe SALOMON (45min) ..68
- Correlation-induced Bloch oscillations in a translationally invariant one-dimensional Bose liquid**
Hanns-Christoph Naegerl (30min) ..69
- Fermionic Mott Insulators under the Microscope**
Martin Zwierlein (30min) ..70

Thursday 28 July, 2:50 pm - 4:20 pm

Quantum gases

Chair: Y. Shin

- Low-lying excitations in strongly interacting Fermi gases**
Chris Vale (30min) ..71
- Quantum Turbulence in BEC: overview and new perspectives**
Vanderlei Bagnato (30min) ..72
- Orbital optical lattices**
Andreas Hemmerich (30min) ..73

Thursday 28 July, 4:45 pm - 6:30 pm

Quantum optics and cavity QED

Chair: T. Northup

- What does the Golden Ratio have to do with friction? An answer atom by atom**
Vladan Vuletic (45min) ..74
- BEC with Spin-Orbit coupling**
Jian-Wei Pan (30min) ..75
- Einstein-Podolsky-Rosen Entanglement of Narrowband Photons from Cold Atoms**
Yoon-Ho Kim (30min) ..76

Friday 29 July, 8:30 am - 10:15 am

Cold molecules

Chair: J. Ye

Direct laser cooling and trapping of diatomic molecules

David DeMille (45min)

..77

Laser cooling and trapping of molecules: experiments and models

Michael Tarbutt (30min)

..78

Coherent control of ultracold $^{87}\text{Rb}^{133}\text{Cs}$ molecules

Simon Cornish (30min)

..79

Friday 29 July, 10:40 am - 12:20 pm

Hot Topics

Chair: G. Jo

Ultracold chemistry and asymptotic physics with diatomic strontium molecules

Robert Moszynski (25min)

..80

Experimental realization of a two-dimensional synthetic spin-orbit coupling in ultracold Fermi gases

Jing Zhang (25min)

..81

Cat states and quantum metrology with Rydberg atoms

Jean-Michel Raimond (25min)

..82

Einstein-Podolsky-Rosen entanglement in spinor Bose-Einstein condensates

Carsten Klempt (25min)

..83

Friday 29 July, 12:20 pm - 12:35 am

Closing

Chair: D. Cho

Poster Session

Monday 25 July, 12:25 pm – 14:50 pm

Precision Measurements and Fundamental Tests

Mon-001	Constraining Neutrino Electromagnetic Properties by Low Energy Atomic Response	..87
Mon-002	A Velocimeter Based on Enhanced Light-Dragging Effect in a Moving Electromagnetically Induced Transparent Medium	..88
Mon-003	Measurement and control of single nitrogen-vacancy centers in diamonds rotating at high speed	..89
Mon-004	Optically-pumped atomic magnetometry for magnetic nanoparticle detection and characterization	..90
Mon-005	Extensive Study of the atomic Hong-Ou-Mandel experiment in momentum space with metastable Helium	..91
Mon-006	Towards measuring parity violation in cold chiral molecules using vibrational spectroscopy	..92
Mon-007	Analysis of effective electric fields of heavy molecules for search of the electron EDM	..93
Mon-008	Progress towards laser spectroscopy of antihydrogen in the ALPHA experiment	..94
Mon-009	High density nitrogen-vacancy centers magnetometry with a MgF ₂ /TiO ₂ coated diamond	..95
Mon-010	Ultra-sensitive all-optical magnetometer for analyzing magnetization produced by hyperpolarized noble gas	..96
Mon-011	Simultaneous direct spectral purity transfer at three optical clock transitions using an all-PM Er-doped fiber frequency comb	..97
Mon-012	Progress towards a cold, slow beam of YbF molecules for measuring the electron's electric dipole moment	..98
Mon-013	Lifetime of surface plasmon produced in femtosecond laser-structuring	..99
Mon-014	Precision spectroscopy of the 2S-4P transition in atomic hydrogen	..100
Mon-015	A new search for the permanent electric dipole moment of ¹²⁹ Xe	..101
Mon-016	In-beam measurement of the hydrogen hyperfine structure and prospects for antihydrogen spectroscopy	..102
Mon-017	Cold highly charged ions for novel optical clocks and the search for α variation	..103
Mon-018	A method to measure the nuclear anapole moment using ultracold Fr	..104
Mon-019	Light intensity stabilization based on the second harmonic of the photoelastic modulator in the atomic magnetometer	..105
Mon-020	Photon and neutrino emission from quantum ions in circular motion	..106
Mon-021	High density NV center ensembles coupling with uniform microwave magnetic field	..107
Mon-022	Micro-integrated semiconductor laser module platform for precision quantum optical experiments on Earth and in space	..108

Mon-023	PENTATRAP - An advanced high-precision Penning-trap mass spectrometer	..109
Mon-024	Rotation measurement coupling in a K-Rb-21Ne comagnetometer with large light shift	..110
Mon-025	Polarizability and tune-out wavelength for the helium 1s2s 3S state	..111
Mon-026	Detecting dark matter waves with a network of AMO precision measurement tools	..112
Mon-027	A precision measurement of the electron EDM using trapped ions	..113
Mon-028	A novel atomic precession detection method based on the optical fiber interferometer	..114
Mon-029	High-precision evaluation of Wigner's d matrix by exact diagonalization	..115
Mon-030	Mercury Alkalis as Candidates for Electron Electric Dipole Moment Searches	..116
Mon-031	Spin orientation dependent universality of free fall test using atom interferometry	..117
Mon-032	Highly efficient optomechanical excitation of nonlinear mechanical oscillation in high-Q micromechanical resonator	..118
Mon-033	First Results from the GPS.DM Observatory: Dark Matter Search using Atomic Clocks and the GPS Constellation	..119
Mon-034	Cold atoms trapped in dipole trap for quantum nondemolition measurement	..120
Mon-035	Spin-exchange Relaxation Free Regime Discriminant of Atomic Magnetometer	..121
Mon-036	A reflected probe method for detecting the polarization rotating angle of the SERF magnetic measurement	..122
Mon-037	Displacement measurement using an optoelectronic oscillator with an intra-loop Michelson interferometer	..123
Mon-038	Quantum Technology Developments at the University of Birmingham	..124
Mon-039	Measuring electric fields beyond the SQL with Rydberg Schrödinger cat states	..125
Mon-040	Precision spectroscopy with single 40Ca^+ ion in a Paul trap	..126

Spectroscopy, Atomic and Molecular Structure

Mon-041	Photoionization parameters of Double-Excitation Resonances in Mg	..127
Mon-042	Scalar and Tensor Light Shift in Rb and Cs	..128
Mon-043	Towards Precision Measurement of the $21\text{S}_0 \rightarrow 31\text{D}_2$ Two-Photon Transition in Atomic Helium	..129
Mon-044	Observation of vibrational overtones by single molecule resonant photodissociation	..130
Mon-045	Towards Highly Sensitive Cavity-Enhanced Polarimeter with NICE-OHMS Spectroscopy	..131
Mon-046	Spectroscopy of the $2\text{S}-6\text{P}$ transition in atomic hydrogen	..132

Mon-047	Analytical solutions of susceptibility for Doppler-broadened two-level atoms	..133
Mon-048	Analytical calculation of line shape in polarization spectroscopy for the $J_g=0 \rightarrow J_e=1$ transition	..134
Mon-049	Precision spectroscopy of ^{87}Rb Rydberg states using an optical frequency synthesizer based on an optical frequency comb	..135
Mon-050	Spectroscopy of the Hydrogen $1s-3s$ Transition with chirped Laser Pulses	..136
Mon-051	Photodissociation of ultracold, quantum state-selected $^{88}\text{Sr}_2$ molecules	..137
Mon-052	Phase noise effects of optical fields in four-wave mixing process	..138
Mon-053	Doppler-free spectroscopy of the $5P_{3/2} \rightarrow 6P_{3/2}$ electric quadrupole transition in atomic rubidium	..139
Mon-054	Control of electronic magnetic state populations via light polarization in the $5P_{3/2} \rightarrow 6P_{3/2}$ electric quadrupole transition in atomic rubidium	..140
Mon-055	Investigation of the $A1\Sigma^+$ states of the NaH and NaD molecules	..141
Mon-056	Laser absorption spectroscopy of iodine: 915 nm to 985 nm in a single scan	..142
Mon-057	Vibrational quantum defect and rotational constants resonances analyzed in a 2-channel model to measure the coupling between molecular series	..143
Mon-058	Effect of rotational-state-dependent molecular alignment on the optical dipole force	..144
Mon-059	Zeeman spectroscopy and polarization dependence of $3S-4D$ two-photon transition in Na atoms	..145
Mon-060	Compare the neutron skin size data obtained from simulation and experiment of Pb-208 and Ca-48	..146
Mon-061	Towards Precision Laser Spectroscopy of Lithium $2S-3P$ Transition	..147
Mon-062	Two-electron atomic systems: Calculations and properties of the angular components of the Fock expansion	..148
Mon-063	Experimental Study on Spectra and Lifetimes of Rare-earth Atoms	..149
Mon-064	Cavity-enhanced Raman Microscopy of Individual Carbon Nanotubes	..150
Mon-065	MCDHF calculations of He-like ions for rare gases	..151
Mon-066	Transition from doubly excited states to singly excited states in LiH	..152
Mon-067	Study of nonadiabatic couplings in HeH ⁺ and HeH	..153
Mon-068	Fate of ionic states and corridors to doubly excited $(2p\sigma)^2$ provided by the avoided-crossings in H ₂	..154
Mon-069	Time-resolved spectroscopy for $5s' 4D_{7/2}$ state transition from electron-ion recombination in femtosecond laser-produced copper plasma	..155
Mon-070	Selective Photodissociation of Formaldehyde using Fiber Laser System	..156
Mon-071	ppb-Level Detection of $^{14}\text{CO}_2$ Isotopologue using an OA-ICOS	..157

Mon-072	Doppler-free spectroscopy of metastable Sr atoms using a hollow cathode lamp	..158
---------	------------------------------------------------------------------------------	-------

Cooling and Trapping of Atoms and Ions

Mon-073	Development of a novel deep-UV laser system for laser cooling of Hg atom	..159
Mon-074	Stepwise transition of atomic distribution in a moving optical lattice	..160
Mon-075	Cooperative motion and cooling with superradiant and subradiant atoms	..161
Mon-076	Tailored Optical Potentials for Atomtronics	..162
Mon-077	Reformation of holographic single-atom arrays for 3D quantum system architectures	..163
Mon-078	Sub-Micron Period Magnetic Lattices for Ultracold Atoms	..164
Mon-079	Towards the Production of a Quantum Gas near a Tapered Optical Nanofibre	..165
Mon-080	Ion-atom collisions are enhanced by the generation of plasma during photoionization of laser cooled atoms	..166
Mon-081	Anomalous Heating in Surface Ion Traps	..167
Mon-082	Fast and optimal transport of atoms in non-harmonic traps	..168
Mon-083	Coherent Rydberg Excitation of a Single Atom by Lasers Stabilized on a Tunable High Finesse Transfer Cavity	..169
Mon-084	Microwave sideband spectrum of single atoms in a strongly confined optical dipole trap	..170
Mon-085	Laser cooling ^{171}Yb atoms with the $1S_0 - 3P_1$ transition below the Doppler cooling limitation	..171
Mon-086	Laser cooling to $20\mu\text{K}$ with an inverted crossover resonance in ^{171}Yb	..172
Mon-087	Magnetically insensitive ground state cooling of single atom	..173
Mon-088	Doppler-Free multi-photon spectroscopy in MOT	..174
Mon-089	All-optical production and transport of a large ^6Li quantum gas in a crossed optical dipole trap	..175
Mon-090	Magneto-optical trapping of metastable europium atoms	..176
Mon-091	UHV glass chamber with mirrored windows to form a Fabry-Perot cavity	..177
Mon-092	Simulation of cold atomic beam from pyramidal magneto-optical trap funnel	..178
Mon-093	Phase-Engineered Light Patterns for Ultracold Atom Experiments	..179
Mon-094	Laser cooling of ^{87}Rb atoms using $5S_{1/2} - 6P_{3/2}$ transition	..180
Mon-095	Towards laser cooling of BaF	..181

Mon-096	Dynamic holographic single-atom arrays for deterministic single-atom loading	..182
Mon-097	Light Shift of Cesium atom in the Magneto-optical Trap	..183
Mon-098	Scaling of thermal hysteretic behavior in a parametrically modulated cold atomic system	..184
Mon-099	Light-induced atom losses and heating in magneto-optical trap of Dysprosium atoms	..185
Mon-100	Realization of highly uniform microtrap arrays for quantum simulation of many-body systems using Rydberg atoms	..186
Mon-101	Optical specifications of pyramidal micro-mirror fabricated by bulk etching of silicon with Au and MgF ₂ coating for MOT	..187

Mesoscopic Quantum Systems

Mon-102	A pulsed matter-wave interferometer for probing the mass limits of quantum mechanics	..188
---------	--------------------------------------------------------------------------------------	-------

Ultracold Mixtures and Molecules

Mon-103	Optical bichromatic force slowing of MgF molecules	..189
Mon-104	Spin-Orbit-Coupled Bose-Einstein Condensates of Polar Molecules	..190
Mon-105	Coherent control of ground state NaK molecules	..191
Mon-106	Investigation of collisional losses in ultracold Yb(3P ₂)-Li mixtures	..192
Mon-107	An ultracold gas of internal-state controlled polyatomic molecules	..193
Mon-108	Sound Propagation of a Bose-Fermi Mixture Superfluid at Finite Temperatures	..194
Mon-109	Ground state phase diagram of Bose-Fermi mixture with synthetic spin-orbit coupling	..195
Mon-110	Persistent Superfluid Flow Arising from the He-McKellar-Wilkins Effect in Molecular Dipolar Condensates	..196
Mon-111	Phase separation and dynamics of two-component Bose-Einstein condensates	..197
Mon-112	Towards ultracold ²³ Na ⁴⁰ K ground-state polar molecules	..198
Mon-113	The theory study of two-stage crossed beam cooling(TSCBC) in microgravity	..199
Mon-114	Phase diagram of a strongly interacting Bose-Fermi mixture	..200
Mon-115	Hyperfine analysis of newly observed photoassociation spectra of the 2 1P _i , 2 3P _i , and 3 3Sigma states of ultracold ⁸⁵ Rb ¹³³ Cs molecule	..201
Mon-116	Photoassociation spectrum and photoionization spectrum of ultracold RbCs molecules	..202
Mon-117	Laser cooling of polyatomic radical SrOH	..203

Mon-118	Trapping and Cooling of Polar Molecules: YO and OH	..204
Mon-119	Laser slowing of CaF molecules to near the capture velocity of a molecular magneto-optical trap	..205
Mon-120	Towards Triplet Ground State NaLi Molecules	..206
Mon-121	A new ^6Li - ^{53}Cr experiment	..207
Mon-122	Two impurities in a Bose-Einstein condensate: from Yukawa to Efimov attracted polarons	..208
Mon-123	Heteronuclear Efimov scenario in an ultracold Bose-Fermi mixture with large mass imbalance	..209
Mon-124	^{174}Yb and ^6Li mixtures: Rapid quantum degenerate gas production and large mass-mismatched Bose-Fermi dual superfluid studies	..210
Mon-125	Spectroscopy of ultracold LiK molecules	..211
Mon-126	Progress towards a MOT of CaF molecules	..212

Intense Fields and Ultrafast Phenomena

Mon-127	Attosecond lighthouse in highly ionizing medium	..213
Mon-128	Wigner time delay near dipole photoionization Cooper minima: Effects of quadrupole channels	..214
Mon-129	Gaussian wave packet dynamics with re-initialization in Gabor frame	..215
Mon-130	Signatures of intramolecular quantum interference in photoelectron momentum distributions under strong-field molecular ionization	..216
Mon-131	Ultrafast cold electron bunches from atomic gases	..217
Mon-132	Time-dependent multiphoton ionization of Mg atoms in strong laser pulses	..218
Mon-133	Coherence property of femtosecond X-ray FEL pulses and its applications to ultrafast lenseless imaging	..219

Few Body Interactions and Collisions

Mon-134	Calculations of long-range three-body interactions for S-S-P system	..220
Mon-135	Orbital Feshbach Resonance in Alkali-Earth Atoms	..221
Mon-136	Angular resolved measurements of collisions between ultracold ^{40}K and ^{87}Rb	..222
Mon-137	Combining Single Cesium Atoms with a Rubidium BEC	..223
Mon-138	Modulation of association efficiency in a resonant magneto-association of dimers	..224
Mon-139	Experimental Investigation on the Ionization Cross Sections of CH_4 and CO_2 Molecules by Electron Impact at Intermediate Energies	..225
Mon-140	Design and simulation of mass analyzer for electron-ion coincidence measurements	..226

Tuesday 26 July, 12:25 pm – 14:50 pm

Atom Interferometry

Tue-001	Compensation of Coriolis effect in differential measurement of gravity by a dual-species atom interferometer	..229
Tue-002	Reciprocity and time-reversal symmetry in quantum reflection of atomic matter-waves from a diffraction grating	..230
Tue-003	Using atomic interactions for rotation sensing approaching the Heisenberg Limit in ultra-cold gases	..231
Tue-004	Detection method for topological band defects and supersymmetric quantum mechanics	..232
Tue-005	Universal diffraction of atoms and molecules quantum reflected from a plane ruled grating	..233
Tue-006	Atomic multiwave interferometer for Aharonov-Casher-phase measurements	..234
Tue-007	Very Long Baseline Atom Interferometry	..235
Tue-008	ATOM INTERFEROMETRY ON SOUNDING ROCKETS	..236
Tue-009	Atom chip based guided atom interferometer for rotation sensing	..237
Tue-010	Advances in ytterbium BEC contrast interferometry for a new determination of the fine structure constant α	..238
Tue-011	Our cold atom gravimeter join the comparison of the absolute gravity measurement	..239
Tue-012	A proposal on improving the accuracy of gravity gradient measurement by modulating magnetic field	..240
Tue-013	Cold atom interferometer in earthquake monitoring	..241
Tue-014	Atom Interferometry: Single-shot, optical-phase-insensitive interferometry using Bose-Einstein condensates	..242
Tue-015	Study on nuclear magnetic resonance gyroscopes based on ^{133}Cs - $^{129}\text{Xe}/^{131}\text{Xe}$..243
Tue-016	Ramsey-Bordé interferometry for high performance laser stabilization	..244
Tue-017	Inertial sensing using atom interferometry in a noisy environment	..245
Tue-018	Atom interferometer gyroscope using cold atom beam	..246
Tue-019	Measurement progress of the high-sensitivity atom accelerometer to dark energy candidates	..247
Tue-020	Expansion of excited condensation into a ring trap	..248
Tue-021	Magnetically guided Cesium atom interferometer and progress towards a gravity gradiometer for space application	..249
Tue-022	New geometric phase of a dipole under a nonlocal magnetic field	..250
Tue-023	Long time performance of a cold atom gravimeter	..251

Tue-024	Optimal Transport and Magnetic Lensing of Degenerate Matter Waves in Free Fall	..252
Tue-025	Atom-chip based BEC interferometry	..253
Tue-026	Towards an atom interferometer with guided matter waves in an optical fiber	..254

Bose Gases

Tue-027	Self-spin-squeezing in a spinor Bose-Einstein condensate	..255
Tue-028	Long-time nonlinear dynamical evolution for P-band ultracold atoms in an optical lattice	..256
Tue-029	Interacting dynamics of half-quantized vortices in two-component Bose-Einstein condensates	..257
Tue-030	Weak wave turbulence in spin-1 spinor Bose-Einstein condensates	..258
Tue-031	Dirac monopoles with polar-core vortex induced by spin-orbit coupling in spinor Bose-Einstein condensates	..259
Tue-032	Thermally activated phase slips of one-dimensional Bose gases in shallow optical lattices	..260
Tue-033	Quantum degenerate mixtures of bosonic potassium	..261
Tue-034	Faraday Excitations in a Bose-Einstein Condensate	..262
Tue-035	Interspin Interaction Effects with Bose-Einstein Condensates in Optical Lattices	..263
Tue-036	Two Species Superfluid to Study Quantum Turbulence and Vortices: NaK System and the Production of Na BEC	..264
Tue-037	Dynamics of Half-Quantum Vortices in a Spinor Bose-Einstein Condensate	..265
Tue-038	Thermal friction in the decaying turbulence of a highly oblate Bose-Einstein condensate	..266
Tue-039	The two-component Bose-Hubbard Model using ^7Li in an Optical Lattice	..267
Tue-040	Response of the Higgs amplitude mode in the 3D Bose-Hubbard model	..268
Tue-041	Observation of self-organization of a Bose-Einstein condensate to two crossed cavity modes	..269
Tue-042	Domain-size distribution and a fractal domain wall between two percolating domains in segregating Bose-Einstein condensates	..270
Tue-043	Vortex quasicrystals in rotating Bose-Einstein condensates	..271
Tue-044	Phase ordering dynamics in ferromagnetic spin-1 Bose-Einstein condensates	..272
Tue-045	Formation of Stable Soliton and Quantum Magnetism	..273
Tue-046	Vortex reconnections and bounces in trapped atomic Bose-Einstein condensates	..274
Tue-047	Phase fluctuations of Bose gases in the one- to three-dimensional crossover	..275

Tue-048	Dipolar quantum droplets	..276
Tue-049	Non-Abelian turbulence in spinor Bose--Einstein condensates	..277
Tue-050	Many-body physics of out-of-equilibrium periodically modulated ultracold Bose atomic gases	..278
Tue-051	Quench Dynamics of Antiferromagnetic Spin-1 Condensates	..279
Tue-052	One-dimensional spinor Bose gases: Quantum Phase Transitions and Elementary Excitations	..280
Tue-053	Observation of Atomic Four-Wave-Mixing Processes of Multiple Diffraction Orders	..281
Tue-054	Dynamics of vortex lines in three-dimensional Bose-Einstein condensate	..282
Tue-055	A quantum gas microscope of Yb atoms	..283
Tue-056	Dissipative Bose-Hubbard system with cold atoms in an optical lattice	..284
Tue-057	The dynamics of 87Rb BECs configured at the microscale	..285
Tue-058	Probing the phase coherence and excitation spectrum of a toroidal BEC	..286
Tue-059	Density-adjustable all-optical Bose-Einstein condensation and its thermal equilibrium properties from 1D gases to 3D gases	..287
Tue-060	H-wire trap to improve atomic number in BEC state	..288
Tue-061	Superfluidity of light in hot atomic vapor	..289
Tue-062	Exploring the many-body localization transition in two dimensions	..290
Tue-063	Josephson dynamics of a Bose-Einstein condensate in the RF-dressed double well potential	..291
Tue-064	Fate of Anderson localization of a one-dimensional Bose-Einstein condensate after long-time expansion	..292
Tue-065	Exact finite-temperature dynamics of a harmonically quenched Tonks-Girardeau gas	..293
Tue-066	1D and 2D localization of excited states of Bose-Einstein Condensates in presence of disorder	..294
Tue-067	Calorimetry and Coherence of a Photon Bose-Einstein Condensate in a Dye Microcavity	..295
Tue-068	Atom-Cavity physics with a Bose-Einstein condensate in an ultra-narrow band resonator	..296
Tue-069	Quantum Critical Behavior Influenced by Measurement Backaction in Ultracold Gases	..297
Tue-070	Impurities immersed in a BEC. Quantum simulator of the polaron?	..298
Tue-071	Criticality and scaling properties during BEC transition obtained from global thermal expansion	..299
Tue-072	Equation of state for a trapped quantum gas: remnant of zero point energy effects	..300

Tue-073	From quantum turbulence to statistical atom optics: new perspectives in speckle matter wave	..301
Tue-074	Observation of chiral superfluid order in orbital optical lattices	..302
Tue-075	Vortex Clustering Transition in a Confined 2D Quantum Fluid	..303
Tue-076	Controlled polarization of two-dimensional quantum turbulence in atomic Bose-Einstein condensates	..304
Tue-077	Bose-Einstein Condensates in Triple-well Superlattice	..305
Tue-078	Global thermodynamic variables: Determination of the first and second sound velocity of a Bose gas	..306
Tue-079	Twisted decay of quadruply quantized vortices in a Bose-Einstein condensate	..307
Tue-080	Self-bound dipolar droplet: a localized matter-wave in free space	..308
Tue-081	Observation of attractive and repulsive polarons in a Bose-Einstein condensate	..309
Tue-082	1D Bose gas in excited transverse motional state: optimal preparation and relaxation dynamics	..310
Tue-083	Towards Cold Atom Experiments in Chinese Space Station	..311
Tue-084	Generation and decay of spin turbulence in a quenched antiferromagnetic spin-1 condensate	..312

Fermi Gases

Tue-085	Emergence of Metallic Quantum Solid Phase in a Rydberg-Dressed Fermi Gases	..313
Tue-086	Probing Antiferromagnetic Ordering and Dynamics with the Fermi Gas Microscope	..314
Tue-087	dxy-density wave in fermion-fermion cold atom mixtures	..315
Tue-088	Universal Properties in a Fermi Gas with a Resonant p-Wave Interaction	..316
Tue-089	Multiple Majorana Fermions in Bilayer Fermi gases with Spin-Orbit Coupling	..317
Tue-090	Thermodynamic properties of a strongly interacting superfluid Fermi gas at zero temperature	..318
Tue-091	Gorkov--Melik-Barkhudarov correction to superfluid transition temperature of Rashba spin-orbit coupled Fermi gases in two dimensions	..319
Tue-092	Thermodynamic properties and effects of pairing fluctuations in a Fermi gas with a uniaxially anisotropic p-wave interaction	..320
Tue-093	Deterministic Preparation of Few-Fermion Systems in Multiple Potential Wells	..321
Tue-094	Site-Resolved Observation of Charge and Spin Correlations in the 2D Fermi-Hubbard Model	..322
Tue-095	Exactly solvable model for a solitonic vortex in a compressible superfluid	..323
Tue-096	Excitation spectra of a tunable Fermi superfluid	..324

Tue-097	Phase separation and pair condensation in a quasi-2D Fermi gas	..325
Tue-098	Ferromagnetism of a repulsive Fermi gas	..326
Tue-099	Quench dynamics of a confined ultracold Fermi gas: Direct visibility of the Goldstone mode in the single-particle excitations	..327
Tue-100	Fermi Gases in 2D	..328
Tue-101	Pseudogapped density of states in a two-dimensional ultracold Fermi gas near the observed BKT transition temperature	..329
Tue-102	Ratio of Shear Viscosity to Entropy Density of an Ultracold Fermi Gas in the BCS-BEC Crossover Region	..330
Tue-103	Non-equilibrium dynamics of finite one- and two-dimensional Hubbard systems	..331
Tue-104	Manipulating the flow of ultracold atoms through a quantum point contact	..332
Tue-105	Spinor and orbital dynamics of trapped dipolar Fermions	..333
Tue-106	Beyond Gaussian Pair fluctuation theory in strongly interacting Fermi gases	..334
Tue-107	Local Photoemission Spectra in the BCS-BEC Crossover Regime of an Ultracold Fermi Gas in a Harmonic Trap	..335
Tue-108	A strongly correlated Fermi superfluid near an orbital Feshbach resonance: The stability, universal equation of state and Leggett mode	..336
Tue-109	Stoner ferromagnetism of a strongly interacting Fermi gas in the quasirepulsive regime	..337
Tue-110	Bragg spectroscopy on degenerate Fermi gas of ytterbium	..338
Tue-111	Exact and semiclassical fermion dynamics in amplitude modulated lattices	..339
Tue-112	Topological phase transitions in the repulsively interacting Haldane-Hubbard model	..340
Tue-113	Equation of state of a Superfluid Fermi atom gas and Neutron star interior: Similarity and Difference on the viewpoint of phase-shift	..341
Tue-114	Observation of the Efimovian Expansion in Scale Invariant Fermi Gases	..342

Rydberg and Artificial Atoms

Tue-115	Scaling of a driven atomic gas from the weakly-dressed to the quantum critical regime	..343
Tue-116	Optical π Phase Shift Created with a Single-Photon Pulse	..344
Tue-117	Spectral shift and dephasing of Rydberg EIT	..345
Tue-118	A High-Speed Single Ion Source using a Cold Atom Beam and Rydberg Blockade	..346
Tue-119	Progress towards Rydberg gate experiments with Non-destructive hyperfine state selective readout using EMCCD camera	..347
Tue-120	Study of electron source based on the ionization of colds atoms	..348

Tue-121	A compact apparatus of hybrid 2D-MOT and Zeeman slower for ultracold strontium Rydberg atoms	..349
Tue-122	Rydberg mediated long-range interactions between spatially separated photons	..350
Tue-123	Rydberg EIT above atom chips	..351
Tue-124	Three-body resonant energy transfer between Rydberg atoms	..352

Thursday 28 July, 12:25 pm – 14:50 pm

Atomic Clocks

Thu-001	Elimination of Dick noise utilizing two cold-atom ensembles	..355
Thu-002	Inner-shell magnetic dipole transition in Tm atom for optical lattice clock	..356
Thu-003	Development of cryogenic Sr optical lattice clocks and their applications	..357
Thu-004	Generation of a time scale steered by an optical clock	..358
Thu-005	Manipulating cold ^{171}Yb atoms in optical lattice clocks	..359
Thu-006	Strontium single-ion optical clock at NRC	..360
Thu-007	Narrow-line laser cooling of cadmium towards a portable optical lattice clock	..361
Thu-008	A search for the low-energy ^{229}Th nuclear isomeric transition using nuclear resonant scattering	..362
Thu-009	Optical frequency ratio between a stationary Yb lattice clock and a transportable Sr lattice clock	..363
Thu-010	Absolute Frequency Measurement of the $1S_0 \rightarrow 3P_0$ Transition in an ^{171}Yb based Optical Lattice Clock	..364
Thu-011	Single-ion spectroscopy of two quadrupole transitions in ytterbium ions towards search for temporal variation of the fine structure constant	..365
Thu-012	Towards neutral mercury lattice clock in SIOM	..366
Thu-013	Improved limits on variations of the fine structure constant from the frequency ratio of a $^{171}\text{Yb}^+$ single ion clock and a ^{87}Sr lattice clock	..367
Thu-014	Investigating lattice-light induced frequency shifts in an ytterbium optical lattice clock	..368
Thu-015	Towards an optical characterization of the Th-229 nuclear isomer	..369
Thu-016	Spin Squeezed ^{171}Yb Atomic Clock beyond the Standard Quantum Limit	..370
Thu-017	New generation of a mobile primary frequency standard based on cold atoms	..371
Thu-018	Progress towards a Brazilian cesium atomic fountain second generation	..372
Thu-019	Frequency ratio of a mercury optical lattice clock with optical and microwave frequency standards	..373

Quantum Simulation

Thu-020	Thermalization dynamics in a quenched many-body state	..374
Thu-021	Parity symmetry breaking and hysteresis with BECs with tunable interactions in a double-well potential	..375
Thu-022	Realization of Two-Dimensional Spin-orbit Coupling for Bose-Einstein Condensates	..376

Thu-023	Atomic quantum simulation of a three-dimensional U(1) gauge-Higgs model	..377
Thu-024	Critical thermalization in a disordered dipolar spin system	..378
Thu-025	Extended Bose-Hubbard model and atomic quantum simulation of (1+1)D U(1) gauge-Higgs model	..379
Thu-026	Spin and Charge Resolved Quantum Gas Microscopy of Antiferromagnetic Order in Hubbard Chains	..380
Thu-027	Exciton-Polariton Quantum Simulators	..381
Thu-028	Disordered cold atoms in 2D	..382
Thu-029	Imaging fluorescence from individual fermions in an optical lattice	..383
Thu-030	Spin-Orbit Coupling and Spin Textures in Optical Superlattices	..384
Thu-031	Inter-sublattice dynamics of ultracold atoms in an optical Lieb lattice	..385
Thu-032	Experimental realization of a Bose-Hubbard model with cavity-mediated long-range interactions	..386
Thu-033	Realization of Two-dimensional Quantum Walks of Neutral Atoms	..387
Thu-034	Quantum annealing for the number-partitioning problem using a tunable spin glass of ions	..388
Thu-035	Quantum gas microscopy of the interacting Harper-Hofstadter system	..389
Thu-036	Evidence of orbital Feshbach resonances and chiral edge states in ytterbium Fermi gases	..390
Thu-037	Verification of quantum non-equilibrium work relation in the presence of decoherence	..391
Thu-038	Quantum gas microscope for ytterbium atoms with deep potential in the excited state	..392
Thu-039	Spin Hamiltonian, synthetic field, and potential spin squeezing in a strontium optical lattice clock	..393
Thu-040	Quantum implementation of unitary coupled cluster ansatz with minimal-basis	..394
Thu-041	Site-resolved imaging of Fermionic quantum many-body systems	..395
Thu-042	Observation of Four-body Ring-exchange Interactions and Anyonic Fractional Statistics in Optical Lattices	..396
Thu-043	Can theoretical techniques from cold atoms shed light on quantum biology?	..397

Quantum Optics & Cavity QED

Thu-044	Cooperative single-photon subradiant states	..398
Thu-045	Observation of polarization rotation spectra for the D2 lines of 85Rb and 87Rb atoms	..399

Thu-046	Large Cross-Phase Modulations at the Few-Photon Level	..400
Thu-047	Spin-Orbit coupling induced Back-action Cooling in Cavity-	..401
Thu-048	Real-space imaging of a topological edge state with ultracold atoms in an amplitude-chirped optical lattice	..402
Thu-049	Reconstruction of the Jaynes-Cummings field state of ionic motion in a harmonic trap	..403
Thu-050	Combining 1D Nanoscale Waveguides and Cold Atoms	..404
Thu-051	Nanophotonic Cavity QED with Trapped Neutral Atoms	..405
Thu-052	Polarization dependence and discrimination of coherence effect in V-type electromagnetically induced transparency of ^{87}Rb	..406
Thu-053	EIT-based Photonic Memory with Near-Unity Storage Efficiency	..407
Thu-054	Two-Photon Emission from Coherently Excited Solid Parahydrogen	..408
Thu-055	Multi-sublevel effect on the second-order correlation of a single-atom-cavity system	..409
Thu-056	Towards a single-atom register in a fiber micro-cavity for generation of multi-particle entanglement	..410
Thu-057	Coherent and dynamic beam splitting with quantum memory in a cold atomic ensemble	..411
Thu-058	Non reciprocal devices based on chiral light matter interactions	..412
Thu-059	Fiber Integrated Single Photon Source Based on NV Center in Diamond	..413
Thu-060	SiV Centres in Microcavities – An Efficient Single Photon Source at Room Temperature	..414
Thu-061	Temporal pure single photons heralded from entangled biphotons generated from cold atomic ensembles	..415
Thu-062	Laser-cooled cesium atoms loaded into a hollow-core photonic-crystal fiber with a magic-wavelength optical dipole trap	..416
Thu-063	Generation of a squeezed state and a Schrödinger-cat-like state in a cavity by injecting opposite-phase atomic dipoles	..417
Thu-064	Experimental study of a coherently pumped cavity-QED microlaser	..418
Thu-065	Investigation of the enhanced spontaneous emission near an exceptional point in an asymmetric microcavity laser	..419
Thu-066	Experimental generation of quadruple quantum correlated beams from hot rubidium vapor by cascaded four-wave mixing using spatial multiplexing	..420
Thu-067	Quantum dynamics of a two-state system induced by a chirped zero-area pulse.	..421
Thu-068	Shortcuts to adiabatic passage for population transfer in quantum three-level system	..422
Thu-069	Quantum-optical switching and entanglement of solid-state qubits in an integrated nanophotonic system	..423
Thu-070	Quantum engineering of silicon vacancy centers using diamond cantilevers	..424

Thu-071	Defect-induced revival of phonon lasing	..425
Thu-072	Optimal shortcut to adiabatic state transfer in Landau-Zener-type systems	..426
Thu-073	Generation of narrowband entangled photon pairs from cold atoms by helicity conservation	..427
Thu-074	An ion-photon interface for quantum networks and optomechanics	..428
Thu-075	Shaping a single photon without interacting with it	..429
Thu-076	Realization of phonon arithmetic in a quantum system	..430
Thu-077	Quantum correlations in the measurement and control of a solid-state mechanical oscillator	..431
Thu-078	Phase shifting a weak coherent beam by single $^{174}\text{Yb}^+$ ion	..432
Thu-079	Quantum Fisher information as a signature of the superradiant quantum phase transition	..433
Thu-080	Radio-frequency dressed detection of atomic clock states	..434
Thu-081	Transfer of photon bunching via the four-wave mixing process in Rb vapor	..435
Thu-082	Trapping caesium near an optical nanofibre	..436
Thu-083	Selective excitation of V-type quantum system by controlled rapid adiabatic passage	..437
Thu-084	Atom-atom interactions in an 'Alligator' photonic crystal waveguide	..438
Thu-085	Three-photon correlation of the cavity-QED microlaser	..439
Thu-086	Light Spin and Quantum Walks Implied by Rotating Cylindrical Waves with E-Field Parallel to H-Field	..440
Thu-087	Heralded single-photon superradiance from a Doppler-broadened ladder-type atomic ensemble	..441
Thu-088	Nondestructive reconstruction of photon number in an optical cavity using trapped ions	..442
Thu-089	Proposal for spin-nematic squeezing via cavity-assisted Raman transitions	..443
Thu-090	Spin Squeezing in a Spinor Bose-Einstein Condensate	..444
Thu-091	High-efficiency wavelength conversion based on coherent optical memory	..445
Thu-092	Detection of Bell correlations in a spin-squeezed Bose-Einstein condensate	..446

Quantum Information

Thu-093	Experimental measurement of correlation functions in a trapped ion	..447
Thu-094	Coherent-state discrimination with non-destructive measurements	..448

Thu-095	Toric-boson model and finite temperature quantum memory	..449
Thu-096	Towards storage of quantum dot single photons in a rubidium quantum memory	..450
Thu-097	Quantum information approach to Bose-Einstein condensation of composite bosons	..451
Thu-098	Waveguide based photonic chip for manipulating single atom array	..452
Thu-099	An Atomtronic Flux Qubit: A ring lattice of Bose-Einstein condensates interrupted by three weak links	..453
Thu-100	Manifesting nonclassicality beyond Gaussian states by observing a single marginal distribution	..454
Thu-101	Higher-order uncertainty relations for SU(2) symmetric quantum states	..455
Thu-102	Characterization and optimization of the quantum operation of two qubit system using 3D transmon qubits	..456
Thu-103	Experimental simulation of quantum universal-not gate on parallel state	..457
Thu-104	A loophole-free test of Bell's inequality with atoms entangled over a distance of 400m	..458
Thu-105	Detection of genuine tripartite entanglement and steering in hybrid optomechanics	..459
Thu-106	Experimental preparation of high NOON states for phonons	..460
Thu-107	Arbitrary two-qubits controlled-unitary quantum gates on a reconfigurable silicon photonic circuits for quantum information	..461
Thu-108	Unified view of quantum correlations and coherence	..462
Thu-109	Site-specific loading and control of single atoms in a 1D optical lattice	..463
Thu-110	Atom-by-atom assembly of cold quantum matter	..464
Thu-111	Coupling ultracold atoms to a superconducting microwave resonator	..465
Thu-112	Simulation of the small number of qubits in 1D array using MPS method	..466

Trapped Ions

Thu-113	Building an ion trap for quantum information processing	..467
Thu-114	Optical trapping of ions	..468
Thu-115	Cooling and Coherent Manipulation of Small Coulomb Crystals in a Penning Trap	..469
Thu-116	Quantum information processing with mixed-species ion crystals	..470
Thu-117	Coherent manipulation of a single sideband cooled ion in a Penning trap	..471
Thu-118	Nonlinear interactions between normal modes of motion of trapped ions	..472

Thu-119	Constructing a microwave quantum-computer demonstrator device	..473
Thu-120	Towards portable ion traps for highly sensitive magnetometer	..474
Thu-121	Frequency measurement of the $1S_0 \rightarrow 3P_1$ transition of Al^+ via quantum logic spectroscopy with Ca^+	..475
Thu-122	Towards high precision spectroscopy of sympathetically cooled H_2^+	..476
Thu-123	Fidelity measurement for two motional states with the phonon beam splitter	..477
Thu-124	Sympathetic cooling of $^{171}Yb^+$ qubit ions trapped in a chip using different Yb isotope ions	..478
Thu-125	Single Trapped Ca-Ion as a Wave-Front Sensor	..479
Thu-126	Microfabrication of Ion-Trap Chips with Metal-Coated Dielectric Pillars to Reduce Heating of the Trapped Ions	..480
Thu-127	Quantum-state control of ions in surface-electrode ion-trap systems	..481
Thu-128	Long coherence time of single quantum bit in a hybrid ion trap	..482
Thu-129	Towards a new class of trapped ion experiments with ion rings	..483

Postdeadline

Thu-130	Geometric quantum computation with a tripod system of Strontium	..484
---------	-----------------------------------------------------------------	-------

Author index	..485
Advertising	..503,504
Program Table	..505
Map of ICAP2016	..506