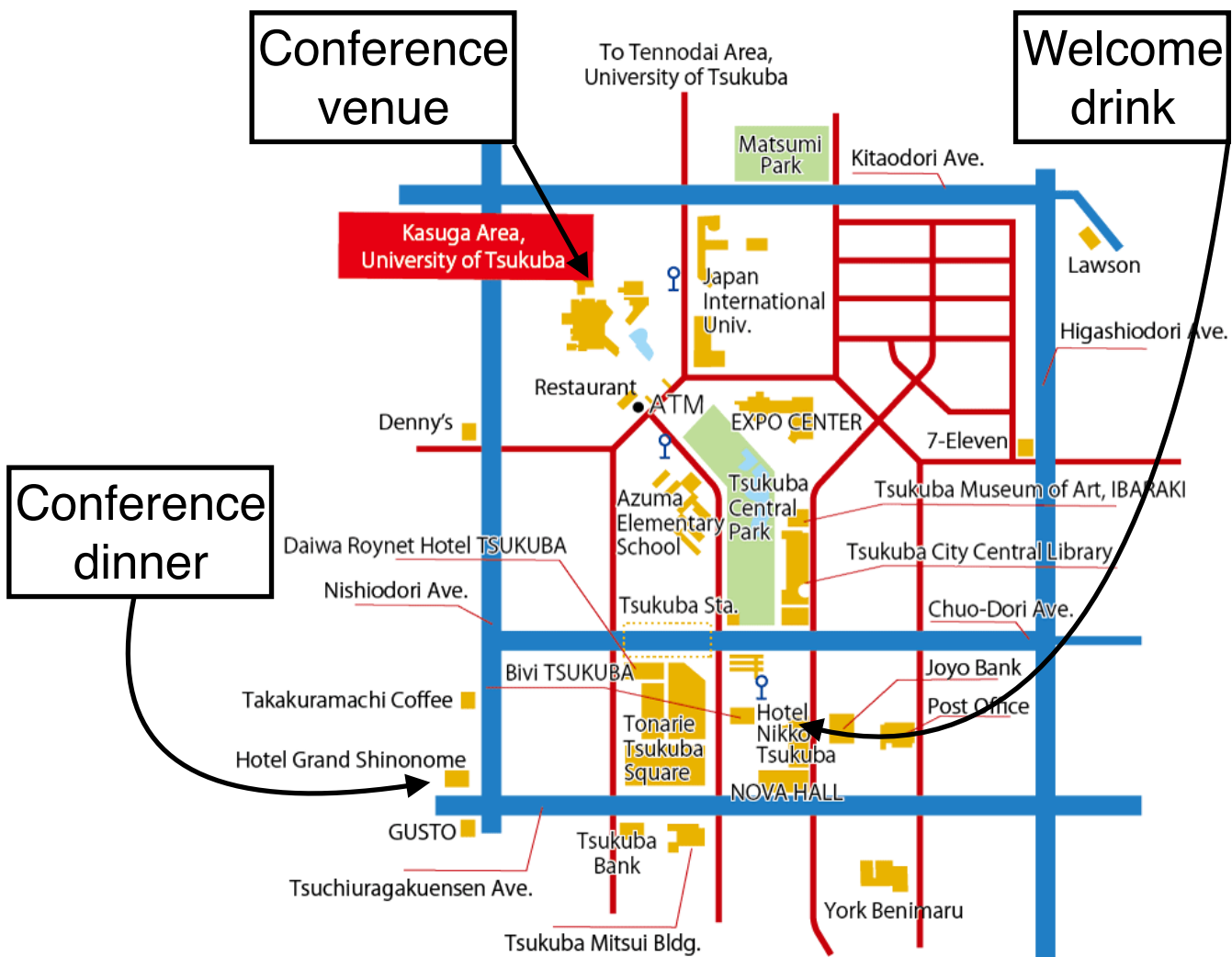


# Recent Progress in Many-Body Theories (RPMBT22)

## Sunday 22 September 2024

Registration & Welcome drink: Registration & Welcome drink - Cafe "Engi" (18:00-20:00)



# Monday 23 September 2024

## **Registration: Registration - Kasuga Auditorium (09:00-09:50)**

## **Session: Opening (Chair: NAKATSUKASA, Takashi) - Kasuga Auditorium (09:50-11:00)**

time	title	presenter
09:50	Welcome by Director of CCS	BOKU, Taisuke
09:55	Welcome by IAC chair	ORTIZ, Gerardo
10:00	Simulating dissipative quantum many-body dynamics via the time-dependent Variational Monte Carlo method	GALLI, Davide Emilio
10:30	A fully-programmable universal quantum simulator using Floquet technology	NEMOTO, Kae

## **Session: Quantum information and computing (Chair: ORTIZ, Gerardo) - Kasuga Auditorium (11:30-12:25)**

time	title	presenter
11:30	Quantum Computing for Nuclear Physics	ROGGERO, Alessandro
12:00	Simple many-body dynamics is a powerful quantum reservoir	SAKURAI, Akitada

## **Session: Computational many-body physics (Chair: NEILSON, David) - Kasuga Auditorium (14:00-15:20)**

time	title	presenter
14:00	Approximating Many-Electron Wave Functions using Neural Networks	FOULKES, Matthew
14:30	Exact Field Induced Ground States of the Quantum Compass Model	SORENSEN, Erik
14:55	Spin-S Kitaev-Heisenberg model on the honeycomb lattice: A high-order treatment of its phase diagram via the coupled cluster method	BISHOP, Raymond

## **Session: Quantum fluids and ultracold gases (Chair: GALLI, Davide Emilio) - Kasuga Auditorium (15:50-17:15)**

time	title	presenter
15:50	Neural-network quantum states for ultra-cold Fermi gases	KIM, Jane
16:20	From ground state energies towards excitations for extended quantum systems	HOLZMANN, Markus
16:50	Boson-fermion pairing in resonant Bose-Fermi mixtures	PIERI, Pierbiagio

# Tuesday 24 September 2024

## Session: Computational many-body physics (Chair: MIYAGI, Takayuki) - Kasuga Auditorium (09:00-10:25)

time	title	presenter
09:00	How to describe all nuclei at polynomial cost in the ab initio framework	SOMÀ, Vittorio
09:30	Surrogate models for quantum many-body systems	YOSHIDA, Sota
10:00	A Comparison of Methods for Simulating Quantum Dot Dynamics	FLATEN, Jonas

## Session: Condensed matter physics (Chair: HATSUGAI, Yasuhiro) - Kasuga Auditorium (10:55-12:20)

time	title	presenter
10:55	Theoretical Modeling of Ultrafast Phase Transitions from the Femtosecond to the Picosecond Scale	CALANDRA, Matteo
11:25	Ab initio structural optimization at finite temperatures based on anharmonic phonon theory	RYOTARO, Arita
11:55	Understanding correlated d- and f-electron systems using DFT and eDMFT methods	QUADER, Khandker

## Session: New frontiers (Chair: DAS, Bhanu) - Kasuga Auditorium (14:00-15:20)

time	title	presenter
14:00	Pseudomodes: from solving the spin-boson model to finding ground states	LAMBERT, Neill
14:30	Recent advances in understanding the sign problem in path integral Monte Carlo simulation of harmonic fermions	CHIN, SIU
14:55	Decoherence of a qubit interacting with a complex spin bath	SHITARA, Nanako

## Session: Nuclear physics (Chair: HINOHARA, Nobuo) - Kasuga Auditorium (15:50-17:10)

time	title	presenter
15:50	Recent advances in ab initio calculations of heavy nuclei	MIYAGI, Takayuki
16:20	BCS-BEC crossover in nuclear matter and related systems	SEDRAKIAN, Armen
16:45	Self-consistent single-nucleon potential describing nuclear structure to intermediate-energy scattering	NAKADA, Hitoshi

## Session: Poster indexing (Chair: HINOHARA, Nobuo) - Kasuga Auditorium (17:10-17:31)

time	title	presenter
17:10	[Indexing] Self-consistent renormalization theory of anisotropic spin fluctuations in nearly ferromagnetic metals	KONNO, Rikio
17:11	[Indexing] High-Precision study of Atomic and Hyperfine-Induced Electric Dipole Polarizability of $^{133}\text{Cs}$	CHAKRABORTY, Arup
17:12	[Indexing] Variational method with an explicit energy functional for symmetric nuclear matter taking into account the spin-orbit force	OSUKA, Toshiya

17:13	[Indexing] Variational method with an explicit energy functional for neutron matter at finite temperature taking into account the spin-orbit force	KITANAKA, Kento
17:14	[Indexing] Shape fluctuation in low-lying states in $N \approx 40$ neutron-rich nuclei	WASHIYAMA, Kouhei
17:15	[Indexing] Emulator technique for linear response calculation within nuclear DFT	HINOHARA, Nobuo
17:16	[Indexing] Nuclear structure study using a hybrid approach of shell model and Gogny-type density functionals	YOSHINAGA, Kota
17:17	[Indexing] The rotational mode caused by the pair condensation in nuclei	RUIKE, Chisato
17:18	[Indexing] Superfluid Band Theory for the Neutron Star Inner Crust	YOSHIMURA, Kenta
17:19	[Indexing] Large-scale shell model study of $\beta^-$ -decay properties of $\{N=126, 125\}$ nuclei along the $r$ -process path	KUMAR, Anil
17:20	[Indexing] Double beta decay phase space factor calculation using Coulomb potential calculated by mean field calculation	KANAI, Atsuya
17:21	[Indexing] Evolution of chirality in the electron-positron pair production driven by photons	YU, Chengpeng
17:22	[Indexing] Automatic Structural Search of Tensor Network States including Entanglement Renormalization	WATANABE, Ryo
17:23	[Indexing] Effect of the Coulomb interaction on nuclear deformation and drip lines	HAGIHARA, Kenta
17:24	[Indexing] Coulomb interaction-driven entanglement of electrons on helium	LEINONEN, Oskar
17:25	[Indexing] The impact of connectivity in qubit networks and the symmetry in the XY model on the quantum machine learning's performance	HAYASHI, Aoi
17:26	[Indexing] A Theoretical Study on Spin-Filter Effect in Layered Materials	INOUE, Jin
17:27	[Indexing] The Hubbard- and van der Waals-corrections on the DFT calculations of epsilon-zeta transition pressure in solid oxygen	LE, The Anh
17:28	[Indexing] Accurate relativistic exchange energy functional for atomic nuclei	ZHAO, QIANG
17:29	[Indexing] Relative Entropy and Mutual Information in Gaussian Statistical Field Theory	SCHRÖFL, Markus
17:30	[Indexing] Realizing Topological Quantum Walks on NISQ Digital Quantum Computer	GIRI, Mrinal Kanti

**Poster session: Poster session (17:30-19:30)**



# Wednesday 25 September 2024

**Session: Quantum chemistry, atomic and molecular physics (Chair: BISHOP, Raymond) - Kasuga Auditorium (09:00-10:25)**

time	title	presenter
09:00	Quantum computations of relativistic and many-body effects in atomic and molecular systems based on variational algorithms	DAS, Bhanu
09:30	New Analytical Representation for Electronic Terms of Nuclear Schiff Moment	ABE, Minori
10:00	High-Precision Calculation of Nuclear Spin Dependent Parity Violation in $^{133}\text{Cs}$	CHAKRABORTY, Arup

**Session: Computational many-body physics (Chair: CHIN, SIU) - Kasuga Auditorium (10:55-12:20)**

time	title	presenter
10:55	Tensor networks and new classical heuristics	CHAN, Garnet Kin-Lic
11:25	Tensor network toward the lattice QCD	AKIYAMA, Shinichiro
11:55	Overcoming Fermionic Sign Problem in Lattice Quantum Monte Carlo: A Cuprate Case	LICHTENSTEIN, Alexander

**Free discussion: Free discussion - Kasuga Auditorium (14:00-17:00)**

# Thursday 26 September 2024

## **Session: Quantum information and computing (Chair: YUNOKI, Seiji) - Kasuga Auditorium (09:00-10:30)**

time	title	presenter
09:00	Continuous-variable optimization: quantum vs classical	NISHIMORI, Hidetoshi
09:30	Quantum many-body scars in dual-unitary circuits	DOOLEY, Shane
10:00	Quantum many-body dynamics in digital quantum computers	SEIJI, Yunoki

## **Session: Condensed matter physics (Chair: ARITA, Ryotaro) - Kasuga Auditorium (11:00-12:20)**

time	title	presenter
11:00	Chester supersolid in dipolar interlayer exciton condensates	CONTI, Sara
11:30	Many-body features in attosecond transient absorption spectroscopy for solids	SATO, Shunsuke
11:55	In Search of an Organizing Principle for Quantum Hall Systems	ORTIZ, Gerardo

## **Session: Non-equilibrium many-body phenomena (Chair: SATO, Shunsuke) - Kasuga Auditorium (14:00-15:20)**

time	title	presenter
14:00	Quasi-steady state descriptions for photo-doped Mott insulators	MURAKAMI, Yuta
14:30	Electron-phonon coupling effect on the vibrational relaxation of CO on Pd(111)	BOMBÍN ESCUDERO, Raúl
14:55	Avalanche Instability as Nonequilibrium Quantum Criticality	HAN, Jong

## **Award session: Award session (Chair: REINHOLZ, Heidi) - Kasuga Auditorium (15:40-17:30)**

time	title	presenter
15:40	Laudatio Feenberg	ORTIZ, Gerardo
15:50	Intertwined Orders and the Physics of High Temperature Superconductors	FRADKIN, Eduardo
16:20	Majorana fermions in condensed matter physics. Examples	TSVELIK, Alexei
16:50	Laudatio Kuemmel	BORONAT, Jordi
17:00	Diagrammatic Monte Carlo for the Hubbard model	ROSSI, Riccardo

## **Conference dinner: Conference dinner - Imperial Room (18:30-21:00)**

# Friday 27 September 2024

## **Session: Quantum fluids and cold atoms (Chair: BORONAT, Jordi) - Kasuga Auditorium (09:00-10:20)**

time	title	presenter
09:00	Bose mixtures at finite temperature: magnetism and condensation phenomena	GIORGINI, Stefano
09:30	Vortices in a dipolar superfluid of interlayer excitons in bilayer semiconductors	NEILSON, David
09:55	The two body density matrix of a Tomonaga Luttinger liquid	DEL MAESTRO, Adrian

## **Session: Nuclear and computational many-body physics (Chair: KIMURA, Masaaki) - Kasuga Auditorium (10:50-12:35)**

time	title	presenter
10:50	Variational Theory and Parquet Diagrams for Nuclear Systems: A Comprehensive Study of Neutron Matter	KROTSCHECK, Eckhard
11:20	An application of the shift-invert Lanczos method to the non-equilibrium Green's function method	UZAWA, Kotaro
11:45	A novel method for extracting and emulating continuum physics of finite quantum systems	ZHANG, Xilin
12:10	Diagrammatic Monte Carlo for the Richardson model and implication to nuclear reactions	BARBIERI, Carlo

## **Free discussion: Free discussion - Kasuga Auditorium (14:00-17:00)**