

[First circular]

Quarks and Compact Stars (QCS 2026)

Tokai, Ibaraki, Japan

We are pleased to announce that international workshop (QCS 2026) will take place at Tokai, Ibaraki, Japan from 29 Apr to 2 May 2026. This workshop is one of the series of workshops among China, Japan, and Korea, to promote international cooperation and exchanges of scientific achievements and perspective in the field of high-density matter and compact stars.

Novel hadronic and/or quark phases are expected to be realized in high-density hadronic matter. Mechanisms of phase transitions and phase equilibrium between these phases should be clarified to obtain the QCD phase diagram. Toward understanding high-density matter in neutron stars (NSs) and formation processes of black holes (BHs) etc., the equation of state (EOS), describing the pressure-density relation, has a key role. In another aspect, dynamical properties of proto-neutron stars are described by the use of hot and dense supernova matter EOS with trapped neutrinos together with transport equations. These issues should be explored based on realistic interaction models that describe the hadron interactions including baryon-baryon and meson-baryon interactions for hadronic phases and quark-hadron and quark-quark interactions for hadron-quark transitions and quark phases. In addition, strangeness degrees of freedom such as hyperons, kaons, and strange quarks may have important effects on the phase structure of high-density matter. Furthermore, these model predictions should be confronted with information from not only lattice QCD results but also heavy-ion experiments and astrophysical observations. High-density matter that may be produced during heavy-ion collisions is one of emphasized topics of the workshop. In fact, heavy-ion experiment, at bombarding energies lower than the existing experiments, is discussed as one of the future projects of J-PARC facility.

Both young and senior researchers from nuclear and hadron physics, particle physics, astrophysics, condensed matter physics, and from these interdisciplinary fields are welcome to join us.

Topics related to this workshop are as follows:

- Equation of state for compact stars, supernovae, and BH formation
 - stiffening high-density EOS by three-baryon repulsions, effects of partial chiral symmetry restoration, reaction rates, etc.

- Various phases in hadronic matter and quark matter
 - baryon superfluidity, hyperon-mixed matter, meson condensation, inhomogeneous chiral density waves, quarkyonic matter, color superconductivity, etc.
- QCD phase diagram
 - hadron-quark phase transition, hadron-quark crossover, chiral phase transition, etc.
- Theoretical approaches for high-density matter
 - relativistic mean-field models, chiral perturbation theory, chiral effective models for hadrons, chiral quark models, lattice QCD, etc.
- Heavy-ion collision experiments and high-density matter
 - hyperon(Y)-nucleon (N), YY interactions, density-dependence of symmetry energy and slope, hadron correlations by femtoscopy, etc.
- Observations and properties of compact stars
 - NS mass and radius by NICER observations, gravitational waves and multi-messenger observations, neutrinos from supernovae, glitches, etc.
- High-energy astrophysics
 - NS-NS mergers, supernovae, cooling history and heating of compact stars, low-mass X-ray bursts, etc.
- Other related topics

- Venue: JAEA Tokai Mirai Base (5 minutes walking distance from JR Joban line Tokai station East exit) (36.464250,140.569389)

- Abstract submission: Now -- 1 Feb 2026

- Registration: Now -- 15 Apr 2026 via homepage. <https://indico2.riken.jp/event/5301>

- Registration fee (includes 1 Banquet and 4 Lunchboxes): We accept credit cards (only Master, Visa, Diners, Amex, and JCB).

	Until 15 Mar 2026	Until 15 Apr 2026
Non-students	25,000 JPY	30,000 JPY
Students	25,000 JPY	25,000 JPY

- Accommodation:

We have 14 twin rooms and 16 single rooms in Tokai Mirai Base (1,200 JPY/night for students and 5,000 JPY/night for non-students). We have 70 single rooms in hotels near Katsuta and Mito stations (approximately 12,000 JPY/night, expensive on Friday and

Saturday). If you are a student and want to stay in Tokai Mirai Base, specify a possible roommate during your stay.

- Cancellation:

On and after 16 Apr 2026, cancellation will be subject to a charge of 10,000 JPY.

- Visa

Chinese participants need visas. Take contact to LOC by e-mail.

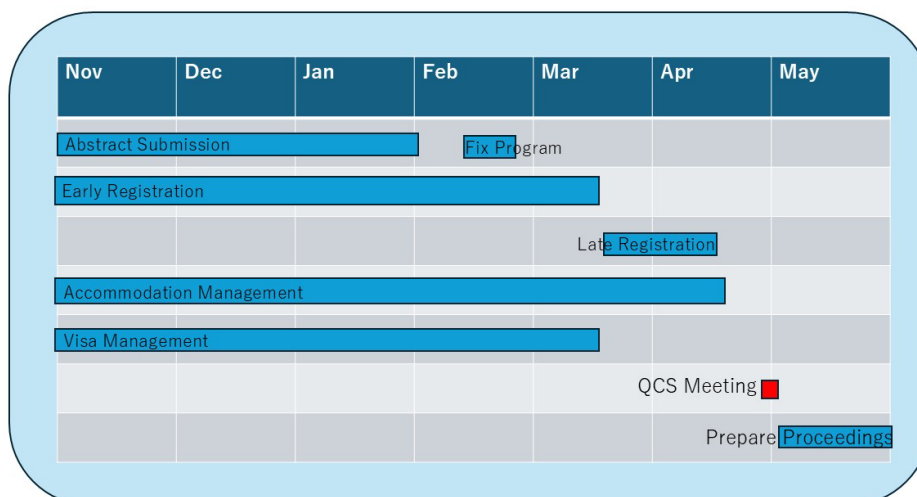
- Local Organizing Committee:

Ahmad Jafar Arifi (JAEA), Akira Dohi (RIKEN), Daisuke Fujii (JAEA), Bikai Gao (RCNP), Philipp Gubler (JAEA), Masayasu Harada (Nagoya), Tetsuo Hyodo (RCNP), Toshiki Maruyama (JAEA, chair), Takumi Muto (Chiba IT), Ken'ichiro Nakazato (Kyushu), Tsuneo Noda (Kurume IT), Hajime Sotani (Kochi), Kei Suzuki (JAEA), Hajime Togashi (Kyoto), Nobutoshi Yasutake (Chiba IT)

- International Advisory Committee:

Myung-Ki Cheoun (Soongsil), Hyun-Chul Kim (Inha), Youngman Kim (IBS), Chang-Hwan Lee (Pusan), Su Houng Lee (Yonsei), Ang Li (Xiamen), Yeunhwan Lim (Yonsei), Guang-Xiong Peng (UCAS), Cheng-Jun Xia (Yangzhou), Renxin Xu (Peking)

- Calendar:



3 November 2025
LOC of QCS 2026