

## 《Ultracold Molecules》 Glossary

- absolute zero (temperature): 【絶対零度】 Lowest possible temperature at which all the (classical) degrees of freedom freezes out. It is defined as zero Kelvin and as -273.15 C on the Celsius scale.
- Bose-Einstein condensation: 【ボース・アインシュタイン凝縮】 When bosonic particles are cooled to temperatures very near absolute zero, large fraction of bosons occupy the ground state and start to behave as "waves." This phase transition is called Bose-Einstein condensation.
- boson: 【ボース粒子】 Bosons are particles which obey Bose-Einstein statistics. Several bosons can occupy the same state.
- bound state: 【束縛状態】
- chemical reaction: 【化学反応】
- critical temperature: 【転移温度】 Temperature at which a phase transition occurs.
- diatomic molecule: 【2原子分子】
- Efimov state: 【エフィモフ状態】 Purely quantum mechanical, three-body bound state that exist when two-body interaction is diverging.
- entropy: 【エントロピー】 A measure of randomness in an ensemble. Entropy is conserved in an adiabatic process.
- fermion: 【フェルミ粒子】 Fermions are particles which obey Fermi-Dirac statistics. Two fermions cannot occupy the same state.
- Feshbach resonance: 【フェッシュバツハ共鳴】 A method to control the two-body interaction between particles.
- ground state: 【基底状態】 The state with the lowest energy of a system.
- hyperfine structure: 【超微細構造】 Small splittings in the energy levels of atoms, molecules and ions. They are caused by nuclear magnetic moment, nuclear quadrupole moment, etc.
- milli kelvin: 【ミリケルビン】 One thousandth of a degree.
- micro kelvin: 【マイクロケルビン】 One millionth of a degree.
- nuclear spin: 【核スピン】 Spin angular momentum of nuclei.
- optical pumping: 【光ポンピング】 A process in which light is used to transfer atom or molecules into different internal state.
- phase transition: 【相転移】 Transformation of a state of matter from one to another, such

as a solid-to-liquid transition.

photoassociation: 【光会合】 A process in which light is used to combine atoms into molecules.

quantum mechanics: 【量子力学】 Theoretical formalism which describes the properties of physical systems using a wave function.

singlet: 【(スピン) 1 重項】 Two electron spins paired and pointing in the opposite direction

spontaneous emission: 【自然放出】

superfluidity: 【超流動】 A matter behaves like a fluid without viscosity. It is closely related to the formation of Bose-Einstein condensate.

superconductivity: 【超伝導】 Zero electrical conductance. It occurs below a phase transition temperature.

threebody collision: : 【3 体衝突】

triplet: 【(スピン) 3 重項】 Two electron spins paired and pointing in the same direction

wavefunction: 【波動関数】 A function which describes the probability amplitude of finding particles at a certain space and time.