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Theoretical studies of multi-component Bose-Einstein condensates

in Theoretical Physics Division of the Institute of Physics PAS under supervision of dr hab. Emilia Witkowska.

The history of research under the system backs to 1924 with the theoretical works of Bose and Einstein. Until late 1990s last century, the development of cooling and trapping techniques of atoms allowed achieving Bose-Einstein condensation in bosonic atomic gases and superfluid states of fermionic atomic gases. Currently, ultra-cold atomic gases form many-body quantum systems which level of experimental control and detection capabilities are simply unbelievable and unattainable in other areas of physics. Such extremely controllable experiments allow implementation of many ideas and physical phenomena, also originating from different branches of physics like solid state, quantum information and metrology or even cosmology.

PhD candidates interested in theoretical studies, in particular of quantum phase transitions, condensation or macroscopic entangled states generation in multi-component Bose-Einstein condensates, including relevant experimental effects, are kindly asked for the contact. The work will consist of analytical and numerical calculations. A supplement to the doctoral scholarship is possible due to participation in research projects.

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