Ultracold atoms and their applications
(Scientific session of the Physical Sciences Division of the Russian Academy of Sciences, 28 October 2015)

A scientific session of the Physical Sciences Division of the Russian Academy of Sciences (RAS), ''Ultracold atoms and their applications'', was held in the conference hall of the Lebedev Physical Institute, RAS, on 28 October 2015.

The papers collected in this issue were written based on talks given at the session:*

(1) **Vishnyakova G A, Golovizin A A, Kalganova E S, Tregubov D O, Khabarova K Yu** (Lebedev Physical Institute, Russian Academy of Sciences, Moscow; Moscow Institute of Physics and Technology (State University), Dolgoprudnyi, Moscow region),
Sorokin V N, Sukachev D D, <u>Kolachevsky N N</u> (Lebedev Physical Institute, Russian Academy of Sciences, Moscow)
"Ultracold lanthanides: from optical clock to a quantum simulator";

* The speakers are underlined as indicated in the program of the session available on the RAS Physical Sciences Division website www.gpad.ac.ru.

(2) **Barmashova T V, Martiyanov K A, Makhalov V B** (Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod),
<u>Turlapov A V</u> (Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod; Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod)
"Fermi liquid to Bose condensate crossover in a two-dimensional ultracold gas experiment";

(3) **<u>Taichenachev A V</u>, <u>Yudin V I</u>, <u>Bagayev S N</u>** (Institute of Laser Physics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk; Novosibirsk State University, Novosibirsk)
"Ultraprecise optical frequency standards based on ultracold atoms: state of the art and prospects";

(4) **<u>Ryabtsev I I</u>, <u>Beterov I I</u>, <u>Tretyakov D B</u>, <u>Entin V M</u>, <u>Yakshina E A</u>** (Rzhanov Institute of Semiconductor Physics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk; Novosibirsk State University, Novosibirsk)
"Spectroscopy of cold rubidium Rydberg atoms for applications in quantum information".