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## **Yevgeny Stadnik (Johannes Gutenberg University of Mainz): New Laboratory and Astrophysical Probes for Low-Mass Dark Matter and Dark Bosons**

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Low-mass bosonic dark matter particles produced after the Big Bang may form an oscillating classical field, which can be sought for in a variety of low-energy laboratory experiments based on spectroscopic, interferometric and magnetometric techniques, as well as in various astrophysical phenomena. Dark bosons can also mediate anomalous fifth forces between ordinary-matter particles that can be sought for in laboratory experiments. Recent measurements in atoms and astrophysical phenomena have already allowed us to improve on existing constraints on various non-gravitational interactions between dark bosons and ordinary-matter particles by many orders of magnitude.

### References:

- [1] Y. V. Stadnik and V. V. Flambaum, *Phys. Rev. D* 89, 043522 (2014).
- [2] B. M. Roberts, Y. V. Stadnik, V. A. Dzuba, V. V. Flambaum, N. Leefler and D. Budker, *Phys. Rev. Lett.* 113, 081601 (2014); *Phys. Rev. D* 90, 096005 (2014).
- [3] Y. V. Stadnik and V. V. Flambaum, *Phys. Rev. Lett.* 113, 151301 (2014).
- [4] Y. V. Stadnik and V. V. Flambaum, *Phys. Rev. Lett.* 114, 161301 (2015); *Phys. Rev. A* 93, 063630 (2016).
- [5] Y. V. Stadnik and V. V. Flambaum, *Phys. Rev. Lett.* 115, 201301 (2015); *Phys. Rev. A* 94, 022111 (2016).
- [6] N. Leefler, A. Gerhardus, D. Budker, V. V. Flambaum and Y. V. Stadnik, *Phys. Rev. Lett.* 117, 271601 (2016).
- [7] Y. V. Stadnik, V. A. Dzuba and V. V. Flambaum, arXiv:1708.00486.
- [8] C. Abel et al. (nEDM collaboration), arXiv:1708.06367; *Phys. Rev. X* (In press).
- [9] V. A. Dzuba, V. V. Flambaum, and Y. V. Stadnik, arXiv:1709.10009; *Phys. Rev. Lett.* (In press).

**Presenter:** STADNIK, Yevgeny (University of New South Wales)

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