Minicolloque n° O27 **X Oral** **☐ Poster**

Atomic forces and dynamics in the photoexcited state: electrons driving atoms and atoms driving electrons

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Ultrafast optical excitation of materials and new time-resolved x-ray and ARPES techniques have opened up new ways of exploring electron and phonon dynamics in the highly excited state. At the same time, electronic structure theory allow us, using simplified models of the photoexcited system, to understand how the photoexcited electrons drive the atomic motion, while phonons drive and scatter electrons. After excitation, anharmonic phonon dynamics in the excited system lead to intriguing squeezing processes and mode decay that can be investigated, both experimentally and theoretically.

[1] J.J. Lee et al. Phys. Rev. Lett. [1] **110**, 047401 (2013).
[2] E.D. Murray & S. Fahy, Phys. Rev. Lett. **114**, 055502 (2015)
[3] S.O' Mahony *et al.*, Phys. Rev. Lett. **123**, 087401 (2019)
[4] M. Trigo et al., Nat. Phys. **9**, 790 (2013)
[5] S. Fahy et al., Phys. Rev. B **93**, 134308 (2018)

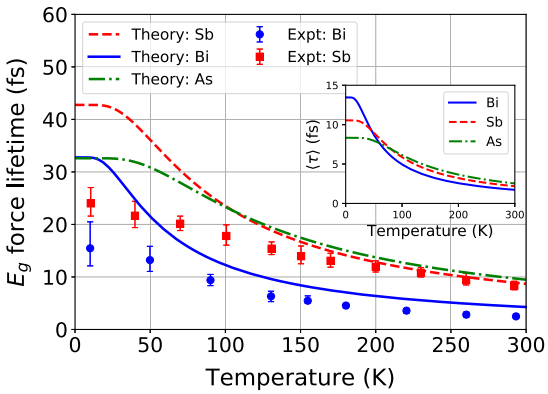

Figure 1 : Lifetime of the photoexcited E_g force in group-V semimetals during a 50 fs, 800nm optical pulse, as a function of temperature. [S.O'Mahony *et al.*, PRL **123**, 087401 (2019)]