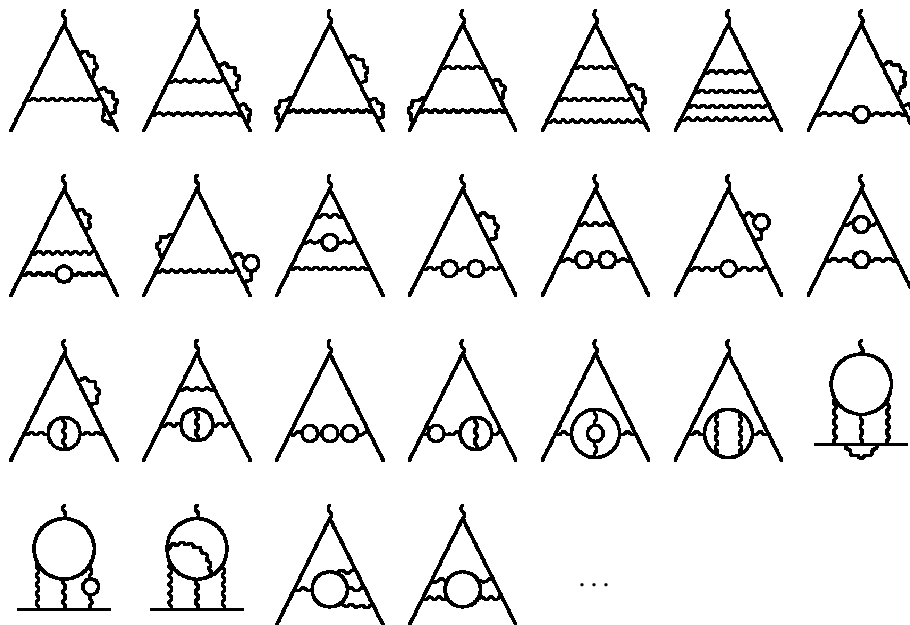


# Four loop QED contributions to the electron $g-2$

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The anomalous magnetic moment of the electron is one of the physical quantities measured with the highest precision. Such high precision demands a similar precision in the theoretical evaluations in order to obtain stringent tests of QED. In this talk I will summarize the situation of the theoretical calculations of the contributions to the electron  $g-2$ ; then, I will describe in detail the results of the twenty-year long project of the evaluation of all the 891 mass-independent four-loop QED Feynman diagrams contributing to the electron  $g-2$  [1],



with the 1100-digits result

$$a_e^{QED}(4\text{-loop}) = -1.912245764926445574152647167439830054060873390658725345\dots \left(\frac{\alpha}{\pi}\right)^4$$

and high-precision analytical fits. The consequences of this result on the QED tests and the determination of the fine structure constant will be also discussed.

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[1] S. Laporta, Phys. Lett. B **772** (2017) 232.