

# Status and prospects of muon $g-2$ theory

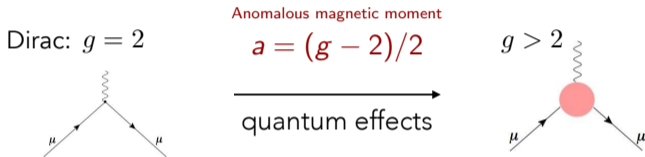
Christoph Lehner  
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June 8, 2026 – PhiPsi26, Pisa

## The magnetic moment and quantum corrections



The  $g$ -factor in  $\vec{\mu} = g \left( \frac{e}{2m} \right) \vec{S}$  describes the strength of coupling to a magnetic field, which can be measured and computed from theory **very** precisely.



The quantum effects arise from virtual particle contributions from all known **and unknown** particles.

By comparing high-precision experiments and theory, we have the potential to learn about such contributions of new particles.

- Constrain new physics as

$$a_{\mu}^{\text{Theory}} = a_{\mu}^{\text{SM}} + a_{\mu}^{\text{BSM}} = a_{\mu}^{\text{Experiment}}$$

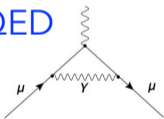
With **spectacular** new result from Fermilab just seen in previous talk.

**Congratulations on 2026 Breakthrough Prize in Fundamental Physics!**

- Contributions of the Standard Model (SM):

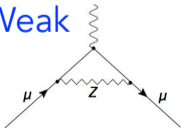
$$a_{\mu}^{\text{SM}} = a_{\mu}^{\text{QED}} + a_{\mu}^{\text{EW}} + a_{\mu}^{\text{HVP}} + a_{\mu}^{\text{HLbL}}$$

QED



+ ...

Weak

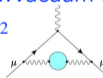


+ ...

Hadronic...

...Vacuum Polarization (HVP)

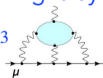
$\alpha^2$



+ ...

...Light-by-Light (HLbL)

$\alpha^3$



+ ...

## Status as of g-2 Theory Initiative Whitepaper 2025

## The anomalous magnetic moment of the muon in the Standard Model: an update

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Rebhan<sup>60</sup>, C. F. Redmer<sup>1-2</sup>, B. L. Roberts<sup>78</sup>, A. Rodríguez-Sánchez<sup>79</sup>, P. Roig<sup>29,71</sup>, J. Ruiz de Elvira<sup>79</sup>, P. Sánchez-Puertas<sup>80</sup>, A. Signer<sup>81,59</sup>, J. W. Sitison<sup>73</sup>, D. Stamen<sup>55</sup>, D. Stöckinger<sup>82</sup>, H. Stöckinger-Kim<sup>82</sup>, P. Stoffer<sup>59,81</sup>, Y. Sue<sup>69</sup>, P. Tavella<sup>44</sup>, T. Teubner<sup>83</sup>, J.-N. Toelstede<sup>59,81</sup>, G. Toledo<sup>83</sup>, W. J. Torres Bobadilla<sup>23</sup>, J. T. Tsang<sup>54</sup>, F. P. Ucci<sup>16,17</sup>, Y. Ulrich<sup>23</sup>, R. S. Van de Water<sup>84</sup>, G. Venanzoni<sup>23,48</sup>, S. Volkov<sup>85</sup>, G. von Hippel<sup>1,2</sup>, G. Wang<sup>37</sup>, U. Wenger<sup>18</sup>, H. Wittig<sup>1,2,26</sup>, A. Wright<sup>23</sup>, E. Zaid<sup>23</sup>, M. Zanke<sup>55</sup>, Z. Zhang<sup>24</sup>, M. Zillinger<sup>18</sup>, C. Alexandrou<sup>86,87</sup>, A. Altherr<sup>44</sup>, M. Anderson<sup>1-2</sup>, C. Aubin<sup>88</sup>, S. Bacchio<sup>87</sup>, P. Belltrame<sup>23</sup>, A. Beltran<sup>1-2</sup>, P. Boyle<sup>89</sup>, I. Campos Plascencia<sup>90</sup>, I. Caprini<sup>91</sup>, B. Chakraborty<sup>92</sup>, G. Chanturia<sup>95</sup>, A. Crivellin<sup>79</sup>, A. Czarnecki<sup>93</sup>, L.-Y. Dai<sup>94</sup>, T. Dave<sup>23</sup>, L. Del Debbio<sup>46</sup>, K. Demory<sup>24</sup>, D. Djukanovic<sup>26</sup>, T. Draper<sup>95</sup>, A. Driutti<sup>48</sup>, M. Endo<sup>96</sup>, F. Erben<sup>54</sup>, K. Ferraby<sup>23</sup>, J. Finkenrath<sup>54</sup>, L. Flower<sup>23</sup>, A. Francis<sup>97</sup>, E. Gámiz<sup>98</sup>, J. Gogniat<sup>18</sup>, A. V. Grebe<sup>84</sup>, S. Gündogdu<sup>81,59</sup>, M. T. Hansen<sup>46</sup>, S. Hashimoto<sup>96</sup>, H. Hayashii<sup>99</sup>, D. W. Hertzog<sup>20</sup>, L. A. Heuser<sup>55</sup>, L. Hostetler<sup>43</sup>, X. T. Hou<sup>100</sup>, G. S. Huang<sup>101</sup>, T. Iijima<sup>102,49</sup>, K. Inami<sup>99</sup>, A. Jüttner<sup>54,92</sup>, R. Kitano<sup>103</sup>, M. Knecht<sup>37</sup>, S. Kollatzsch<sup>81,59</sup>, A. S. Kronfeld<sup>84</sup>, T. Lenz<sup>1-2</sup>, G. Levati<sup>18</sup>, Q. M. Li<sup>100</sup>, Y. P. Liao<sup>100</sup>, J. Libby<sup>104</sup>, K. F. Liu<sup>95</sup>, V. Lubich<sup>96</sup>, M. T. Lynch<sup>83,9</sup>, A. T. Lytle<sup>8,9</sup>, J. L. Ma<sup>100</sup>, K. Miura<sup>96</sup>, K. Möhling<sup>82</sup>, J. Muskalla<sup>1,2</sup>, F. Noël<sup>18</sup>, K. Otnad<sup>1-2</sup>, P. Paradisi<sup>4,5</sup>, C. T. Peterson<sup>105</sup>, A. Pich<sup>71</sup>, S. Pitelis<sup>41</sup>, S. Plura<sup>1-2</sup>, A. Price<sup>106</sup>, D. Radic<sup>81,59</sup>, A. Radzhabov<sup>27</sup>, A. Risch<sup>107</sup>, S. Romiti<sup>18</sup>, S. Sahoo<sup>108</sup>, F. Sannino<sup>25,19</sup>, H. Schäfer<sup>55</sup>, Y. Schelhaas<sup>1,2</sup>, S. I. Serednyakov<sup>27</sup>, O. Shekhovtsova<sup>109,110</sup>, J. N. Simone<sup>84</sup>, S. Simula<sup>111</sup>, E. P. Solodov<sup>27</sup>, F. M. Stokes<sup>46</sup>, M. Vanderhaeghen<sup>1-2</sup>, A. Vaquero<sup>112,113</sup>, N. Vestergaard<sup>23</sup>, W. Wang<sup>1-2</sup>, K. Yamashita<sup>114</sup>, Y. B. Yang<sup>115</sup>, T. Yoshioka<sup>116</sup>, C. Z. Yuan<sup>100</sup>, A. S. Zhevlakov<sup>27</sup>

## Second whitepaper (WP25) of Muon g-2 Theory Initiative released one year ago

235 authors

### Steering Committee:

- Gilberto Colangelo (University of Bern)
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- Aida X. El-Khadra (University of Illinois) chair
- Martin Hoferichter (University of Bern)
- Christoph Lehner (University of Regensburg) co-chair
- Laurent Lellouch (Marseille)
- Tsutomu Mibe (KEK)
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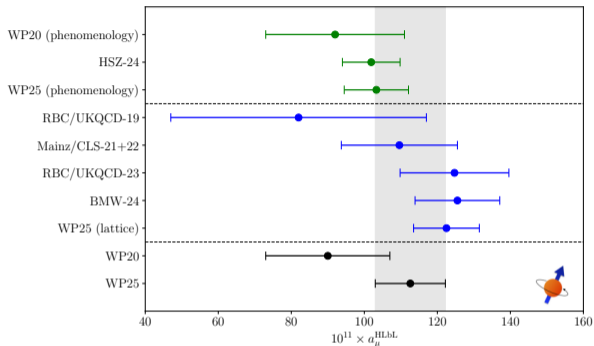
## What has happened in the last five years since WP20?

Contributions to  $a_{\mu}^{\text{SM}} \times 10^{11}$

| Contribution                         | WP25             | WP20                 |
|--------------------------------------|------------------|----------------------|
| QED                                  | 116 584 718.8(2) | 116 584 718.931(104) |
| EW                                   | 154.4(4)         | 153.6(1.0)           |
| HVP (LO + NLO + NNLO)                | ...              |                      |
| HLbL (phenomenology + lattice + NLO) | 115.5(9.9)       | 92(18)               |

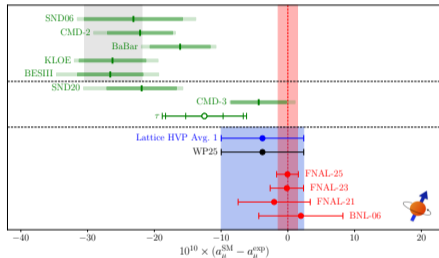
- ▶ QED and EW contributions already had been determined in WP20 with sufficient precision to match FNAL E989. Nevertheless important progress:
  - ▷ Discrepancy in 5-loop QED contribution has been resolved ([S. Volkov](#); [Aoyama](#), [Hayakawa](#), [Hirayama](#), [Nio](#))  $\Rightarrow$  small shift and increased uncertainty due to tensions in fine-structure constant measurements
  - ▷ EW contributions more precise due to better knowledge of input parameters and hadronic effects in two-loop EW contributions ([Hoferichter](#), [Stoffer](#), [Zillinger](#))
- ▶ HLbL has improved from both data-driven and lattice QCD side (see next slide)
- ▶ HVP ... a story in three acts (see most of the talk)

# Status of HLbL



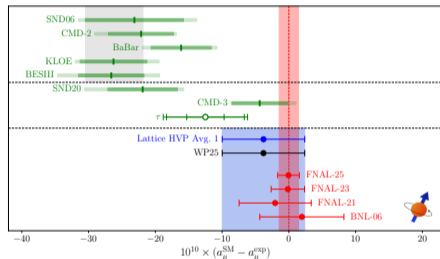
- ▶ Agreement between lattice QCD and dispersive method
- ▶ Uncertainty halved since WP20
- ▶ WP25 consistent with WP20 result
- ▶ Uncertainty now already smaller than final Fermilab E989 experimental uncertainty

## Major change from WP20 for HVP contribution. The story in a nutshell:



- ▶ WP20 result based on hadronic  $e^+e^-$  decays
- ▶ Since CMD-3 experiment no reasonable average can be provided
- ▶  $\tau$  has been scrutinized again, critical: IB corrections
- ▶ Lattice QCD has substantially matured and can provide a robust estimate
- ▶ With lattice QCD the SM is consistent with Fermilab E989

## Major change from WP20 for HVP contribution. The story in a nutshell:



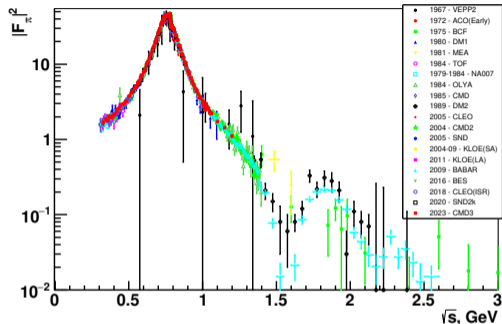
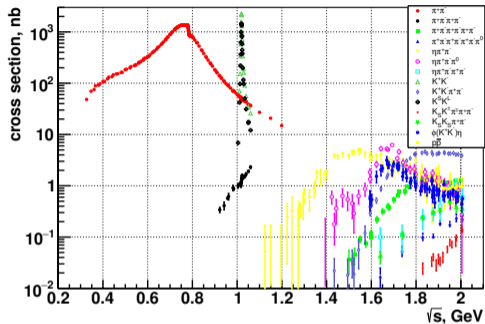
Entire story in three acts:

1. HVP from hadronic  $e^+e^-$  decays
2. HVP from  $\tau$  decays
3. HVP from lattice QCD

## Act 1: HVP from hadronic $e^+e^-$ decays

Where did the g-2 tension go?

# HVP from hadronic $e^+e^-$ decays - method

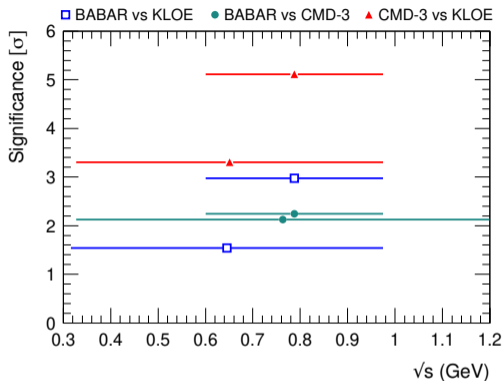
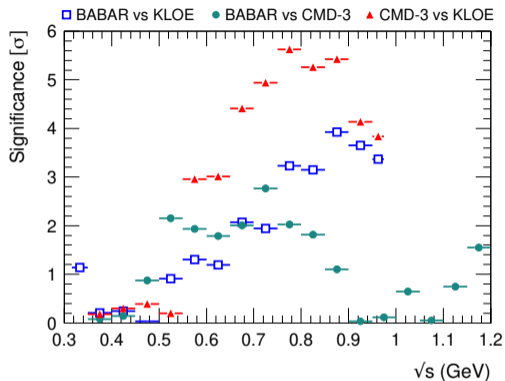


$$a_\mu^{\text{HVP, LO}} = \left(\frac{\alpha m_\mu}{3\pi}\right)^2 \int_{s_{\text{thr}}}^{\infty} ds \frac{\hat{K}(s)}{s^2} R_{\text{had}}(s),$$

$$R_{\text{had}}(s) = \frac{3s}{4\pi\alpha^2} \sigma[e^+e^- \rightarrow \text{hadrons}(+\gamma)]$$

with known function  $\hat{K}(s)$

# HVP from hadronic $e^+e^-$ decays - tensions between the data sets

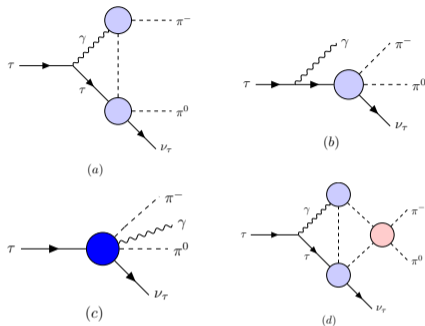


- ▶ Tensions are highly statistically significant
- ▶ TI organized dedicated workshops to scrutinize these tensions
- ▶ Intensified studies of event generators
- ▶ Origin of tensions is not understood at point of WP25
- ▶ No averaging of results attempted for WP25

## Act 2: HVP from hadronic $\tau$ decays

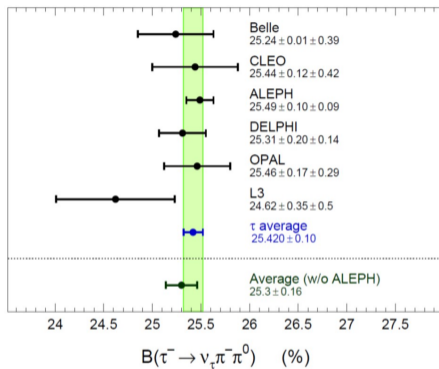
Didn't the  $\tau$  data say there is no new physics all along?

## HVP from hadronic $\tau$ decays - methodology



- ▶ Relate  $\tau \rightarrow \nu_\tau \pi^0 \pi^-$  decays to  $\gamma^* \rightarrow \pi^+ \pi^-$  amplitudes
- ▶ This requires consistent experimental data sets for the  $\tau$  decays and
- ▶ precise control of isospin-breaking corrections including
  - ▷ a consistent renormalization scheme from the EW scale to the effective theory (or lattice QCD) within which one computes the IB corrections
  - ▷ Control of long-distance QED effects

## HVP from hadronic $\tau$ decays - data situation



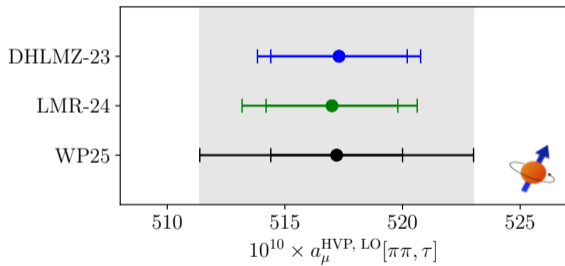
- ▶ Available data sets are consistent
- ▶ Precision suffices for a competitive result

## HVP from hadronic $\tau$ decays - isospin breaking corrections

|  | Refs. [168, 196]                    | Ref. [211]                                 | Refs. [239, 249]                          | Our estimate |
|--|-------------------------------------|--|---|--------------|
| Phase space                                    | -7.88                               | -7.52                                      | -   | -7.7(2)      |
| $S_{EW}$                                       | -12.21(15)                          | -12.16(15)                                 | -   | -12.2(1.3)   |
| $G_{EM}$                                       | -1.92(90)                           | -1.67 <sup>+0.60</sup> <sub>-1.39</sub>    | -   | -2.0(1.4)    |
| FSR  | 4.67(47)                            | 4.62(46)                                   | 4.42(4)                                   | 4.5(3)       |
| $\rho$ - $\omega$ mixing                       | 4.0(4)                              | 2.87(8)                                    | 3.79(19)                                  | 3.9(3)       |
|  | $\Delta M_\rho$                     | 0.20( <sup>+27</sup> <sub>-19</sub> )(9)   | 1.95 <sup>+1.56</sup> <sub>-1.55</sub>    | -            |
|  | $\Delta\Gamma_\rho(\Delta M_\pi)$   | 4.09(0)(7)                                 | 3.37                                      | -            |
| $\frac{F_V^Y}{f_\pi}$ (w/o $\rho$ - $\omega$ ) | $\Delta\Gamma_\rho(\pi\pi\gamma)$   | -5.91(59)(48)                              | -6.66(73)                                 | -            |
|  | $\Delta\Gamma_\rho(g_{\rho\pi\pi})$ | -  | -   | -            |
|  | Total                               | -1.62(65)(63)                              | (-1.34) <sup>+1.72</sup> <sub>-1.71</sub> | -1.5(4.7)    |
| Sum  | -14.9(1.9)                          | (-15.20) <sup>+2.26</sup> <sub>-2.63</sub> | -   | -15.0(5.1)   |

- ▶ IB corrections still make the  $\tau$ -based evaluation of the HVP model dependent
- ▶ In future lattice QCD and dispersive approaches could provide first-principle results
- ▶ Quoted uncertainty was a compromise reached during the WP25 process. Larger than previous uncertainties.

## HVP from hadronic $\tau$ decays - summary



# HVP from hadronic $\tau$ decays - isospin breaking corrections (update on $G_{EM}$ )

## WP25

|  | Refs. [168, 196]                    | Ref. [211]                 | Refs. [239, 249]          | Our estimate |
|--|-------------------------------------|----------------------------|---------------------------|--------------|
| Phase space                                    | -7.88                               | -7.52                      | -                         | -7.7(2)      |
| $S_{EW}$                                       | -12.21(15)                          | -12.16(15)                 | -                         | -12.2(1.3)   |
| $G_{EM}$                                       | -1.92(90)                           | $-1.67^{+0.60}_{-1.39}$    | -                         | -2.0(1.4)    |
| FSR  | 4.67(47)                            | 4.62(46)                   | 4.42(4)                   | 4.5(3)       |
| $\rho$ - $\omega$ mixing                       | 4.0(4)                              | 2.87(8)                    | 3.79(19)                  | 3.9(3)       |
|  | $\Delta M_\rho$                     | $0.20^{+27}_{-19}(9)$      | $1.95^{+1.56}_{-1.55}$    | -            |
|  | $\Delta\Gamma_\rho(\Delta M_\pi)$   | 4.09(0)(7)                 | 3.37                      | -            |
| $\frac{F_V^V}{f_\pi}$ (w/o $\rho$ - $\omega$ ) | $\Delta\Gamma_\rho(\pi\pi\gamma)$   | -5.91(59)(48)              | -6.66(73)                 | -            |
|  | $\Delta\Gamma_\rho(g_{\rho\pi\pi})$ | -                          | -                         | -            |
|  | Total                               | -1.62(65)(63)              | $(-1.34)^{+1.72}_{-1.71}$ | -1.5(4.7)    |
| <b>Sum</b>                                     | -14.9(1.9)                          | $(-15.20)^{+2.26}_{-2.63}$ | -                         | -15.0(5.1)   |

Colangelo, Cottini, Hoferichter, Holz [2511.07507]  
 Note change of  $G_{EM}$  in dispersive approach

|                        | Ref. [114] | Ref. [115]                 | Ref. [9]   | This work  |
|------------------------|------------|----------------------------|------------|------------|
| Phase space            | -7.88      | -7.52                      | -7.7(2)    | -7.74(5)   |
| $S_{EW}^{\pi\pi}$      | -12.21(15) | -12.16(15)                 | -12.2(1.3) | -12.2(1.3) |
| $G_{EM}^{\text{full}}$ | -1.92(90)  | $(-1.67)^{+0.60}_{-1.39}$  | -2.0(1.4)  | -5.4(5)    |
| Sum                    | -22.01(91) | $(-21.35)^{+0.62}_{-1.40}$ | -21.9(1.9) | -25.3(1.4) |
| Full                   | -          | -                          | -          | -24.8(1.4) |
| $\tilde{a}_\mu$        | 510.3(3.0) | $510.9^{+2.9}_{-3.1}$      | 510.3(3.4) | 509.5(2.7) |

## Act 3: HVP from lattice QCD + QED

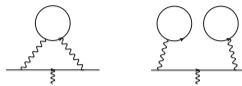
Why should one trust lattice QCD?

## HVP from lattice QCD + QED - method

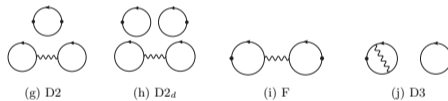
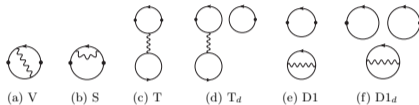
- ▶ First-principles calculation with QCD + QED Lagrangian
- ▶ Discretized Euclidean 4d space-time (finite volume, nonzero lattice spacing)
- ▶ Continuum limit of different discretizations give universal result
- ▶ Perturbative expansion in  $\alpha_{\text{QED}}$  but non-perturbative in  $\alpha_s$ , organized in Feynman diagrams without gluons
- ▶ Uses leadership-class supercomputers (exascale machines) to perform gluonic path-integral calculations as statistical samples from a Markov chain, therefore has statistical uncertainties as well

# Diagrams

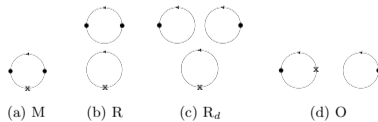
Isospin  
limit



QED  
corrections



Strong  
isospin  
breaking



## HVP from lattice QCD + QED - isospin and flavor decomposition

- ▶ Typically organized as an expansion around isospin symmetric world

$$a_\mu^{\text{HVP, LO}} = a_\mu^{\text{HVP, LO}}(\text{iso}) + \delta a_\mu^{\text{HVP, LO}}$$

- ▶ Definition of isospin symmetric point adopted for WP25:

$$M_{\pi^+} = 135.0 \text{ MeV}, \quad M_{K^0} = M_{K^+} = 494.6 \text{ MeV}, \quad M_{D_s^+} = 1967 \text{ MeV}, \quad \text{and} \quad w_0 = 0.17236 \text{ fm}$$

- ▶ Choice of point irrelevant as long as isospin breaking corrections remain small. Consistency is important for comparison!
- ▶ It is possible to also separately provide different quark flavor contributions:

$$a_\mu^{\text{HVP, LO}}(\text{iso}) = a_\mu^{\text{HVP, LO}}(ud) + a_\mu^{\text{HVP, LO}}(s) + a_\mu^{\text{HVP, LO}}(c) + a_\mu^{\text{HVP, LO}}(b) + a_\mu^{\text{HVP, LO}}(\text{disc})$$

## HVP from lattice QCD + QED - time-momentum representation

Symmetries allow for the reduction of the HVP leading-order diagram to an integral

$$a_{\mu}^{\text{HVP, LO}} = \left(\frac{\alpha}{\pi}\right)^2 \int_0^{\infty} dx_0 C(x_0) \tilde{f}(x_0)$$

over zero-momentum projected Euclidean correlators

$$C(x_0) = -\frac{1}{3} \sum_{k=1}^3 \int d^3x C_{kk}(x_0, \mathbf{x})$$

of two vector currents

$$C_{\mu\nu}(x) = \langle j_{\mu}(x) j_{\nu}(0) \rangle$$

with all quark flavor fields included

$$j_{\mu}(x) = \sum_{f=1}^{N_f} Q_f \bar{q}_f(x) \gamma_{\mu} q_f(x)$$

## HVP from lattice QCD + QED - Euclidean time windows

- ▶ RBC/UKQCD-18 PRL 121, 022003 (2018) introduced Euclidean time windows

$$a_\mu^{\text{HVP, LO}} = a_\mu^{\text{SD}} + a_\mu^{\text{W}} + a_\mu^{\text{LD}},$$

$$a_\mu^{\text{SD}} = \left(\frac{\alpha}{\pi}\right)^2 \int_0^\infty dx_0 C(x_0) \tilde{f}(x_0) [1 - \Theta(x_0, t_0, \Delta)],$$

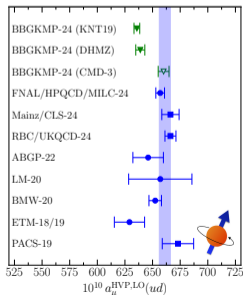
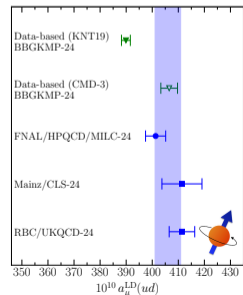
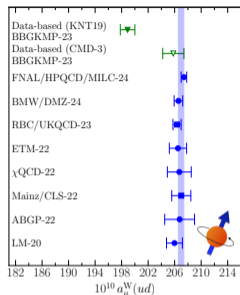
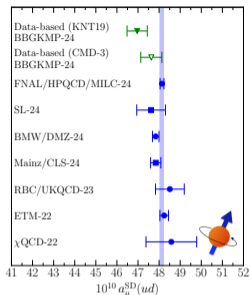
$$a_\mu^{\text{W}} = \left(\frac{\alpha}{\pi}\right)^2 \int_0^\infty dx_0 C(x_0) \tilde{f}(x_0) [\Theta(x_0, t_0, \Delta) - \Theta(x_0, t_1, \Delta)]$$

$$a_\mu^{\text{LD}} = \left(\frac{\alpha}{\pi}\right)^2 \int_0^\infty dx_0 C(x_0) \tilde{f}(x_0) \Theta(x_0, t_1, \Delta),$$

$$\Theta(t, t', \Delta) = \frac{1}{2} + \frac{1}{2} \tanh\left(\frac{t - t'}{\Delta}\right)$$

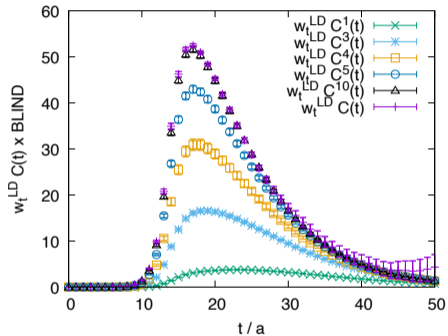
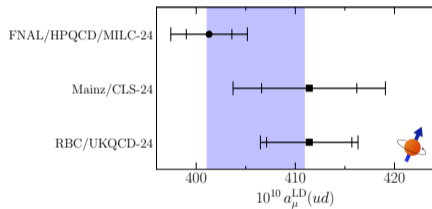
- ▶ Allow for tailored approach since each Euclidean time window has specific challenges (short-distance  $\leftrightarrow$  discretization errors, long-distance  $\leftrightarrow$  statistics, finite-volume errors)
- ▶ Each window well-defined irrespective of regulator, can take some windows from, e.g., hadronic  $e^+e^-$  decays. This was proposed already in RBC/UKQCD-18 and recently picked up by BMW/DHMZ-24 for distances beyond  $t_1 = 2.8$  fm. Tensions of  $e^+e^-$  data need to be negligible in this window.

# HVP from lattice QCD + QED - Euclidean time windows - results



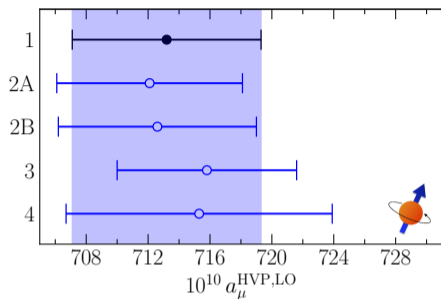
- ▶ Windows allowed for high-precision consolidation over last years
- ▶ Different lattice groups use different discretizations
- ▶ Challenging long-distance window results just arrived in 2024
- ▶ Blinding procedures are now standard for all recent lattice results!
- ▶ Strong tensions in particular in intermediate and long-distance windows (projecting to lower energies) with data-driven hadronic  $e^+e^-$  results (pre CMD-3)

# HVP from lattice QCD + QED - Long-distance window



- ▶ Uncertainty of HVP dominated by long-distance window uncertainty
- ▶ New technology: exclusive state reconstruction, right figure from RBC/UKQCD-24 ([PRL 134, 201901 \(2025\)](#))
- ▶ Other challenge: long-distance of QED corrections is currently not well constrained, added entire phenomenological estimate as added uncertainty for WP25

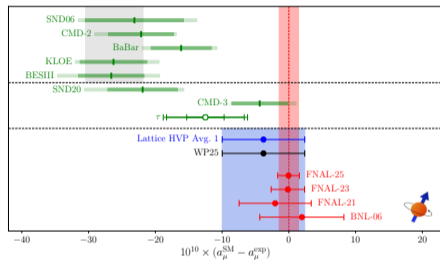
## HVP from lattice QCD + QED - Averaging the lattice results



- ▶ Consolidation of individual components has led to stability, independent of how averages are performed
- ▶ Average 1: For each flavor, average windows first; takes most modern information into account
- ▶ Average 2A: Average results for the total flavor contributions
- ▶ Average 2B: Average results for total flavor contributions constructed from each collaboration's window results
- ▶ Average 3: Average isospin-symmetric total and isospin-breaking corrections separately (BMW, Mainz, RBC/UKQCD enter)
- ▶ Average 4: Average total results of each collaboration (BWM, Mainz, RBC/UKQCD enter)

## Summary and Outlook

## Status after WP25



| Contribution                         | WP25             | WP20                 |
|--------------------------------------|------------------|----------------------|
| HVP LO (lattice)                     | 7132(61)         | 7116(184)            |
| HVP LO ( $e^+e^-$ , $\tau$ )         | Table 5          | 6931(40)*            |
| HVP NLO ( $e^+e^-$ )                 | -99.6(1.3)       | -98.3(7)             |
| HVP NNLO ( $e^+e^-$ )                | 12.4(1)          | 12.4(1)              |
| HLbL (phenomenology)                 | 103.3(8.8)       | 92(19)               |
| HLbL NLO (phenomenology)             | 2.6(6)           | 2(1)                 |
| HLbL (lattice)                       | 122.5(9.0)       | 82(35)               |
| HLbL (phenomenology + lattice)       | 112.6(9.6)       | 90(17)               |
| QED                                  | 116 584 718.8(2) | 116 584 718.931(104) |
| EW                                   | 154.4(4)         | 153.6(1.0)           |
| HVP (LO + NLO + NNLO)                | 7045(61)         | 6845(40)             |
| HLbL (phenomenology + lattice + NLO) | 115.5(9.9)       | 92(18)               |
| Total SM Value                       | 116 592 033(62)  | 116 591 810(43)      |

Need at least 4× reduction in uncertainty to match experimental precision!

Need to consolidate different approaches for HVP

## Roadmap for next years

- ▶ Lattice QCD will continue until exp. precision is matched; no blockers identified so far; timeline depends on computing resources and further improvements in methodology
- ▶ Further scrutiny of hadronic  $e^+e^-$  tensions is needed and on-going
- ▶ Including hadronic  $\tau$  decays after IB corrections available without modelling (LQCD, dispersive approach)
- ▶ Additional approaches to extract the HVP such as MUonE very valuable

# 9th Plenary Workshop of the Muon g-2 Theory Initiative

3–7 Aug 2026

Department of Physics, University of Connecticut

America/New\_York timezone



## Overview

[Call for Abstracts](#)

[Timetable](#)

[Author List](#)

[Speaker List](#)

[Registration](#)

[Participant List](#)

[Travel and Accomodation](#)

[Code of Conduct](#)

[US VISA application](#)

Workshop website (this website): <https://indico.phys.uconn.edu/e/muon-g-2-2026>

The 9th Plenary Workshop of [the Muon g-2 Theory Initiative](#) hosted by the [University of Connecticut \(UConn\)](#) will be held on August 3-7, 2026. The aim of the workshop is to work towards reducing the total error on the Standard Model value of muon anomalous magnetic moment to the level of the Fermilab experiment (124 ppb) and resolve discrepancies between lattice QCD and data-driven approaches for the hadronic vacuum polarization contribution which dominates the total theoretical uncertainty. This series of workshops began with the formation of the theory initiative in 2017. The first plenary workshop was held [near Fermilab in St. Charles, Illinois, in June 2017](#) and last year's was at the [Irène Joliot-Curie Lab \(Paris-Saclay\) in Bures-sur-Yvette, France, in September 2025](#). More details and [a complete list of workshops](#) can be found on the Muon g-2 Theory Initiative website (follow the above link).

## Financial support for early career researchers

There is limited support available for early career attendees. If you are an early career researcher (e.g., graduate student) needing financial support to attend the workshop, please email the local organizers ([thomas.blum@uconn.edu](mailto:thomas.blum@uconn.edu) and [ljin.luchang@gmail.com](mailto:ljin.luchang@gmail.com)). The email should include your current position, institution, and advisor and should briefly describe your current research and whether you have submitted an abstract, or not. The deadline for requests is 05/29/2026.

## Important dates

- Registration and abstract submission deadline: 05/29/2026
- Early career support request deadline: 05/29/2026
- Workshop: Aug 3 - Aug 7, 2026