

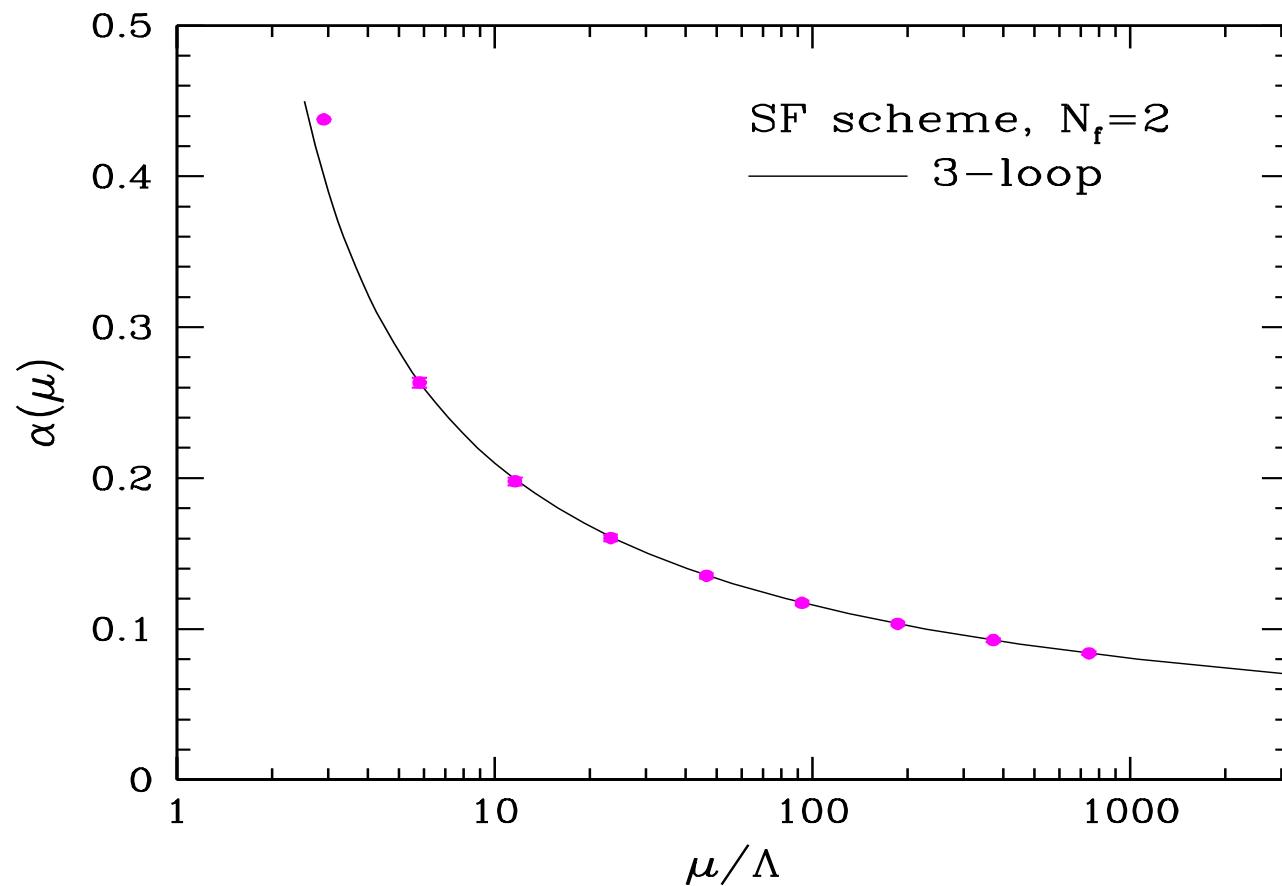
# RUNNING COUPLINGS FROM LATTICE QCD

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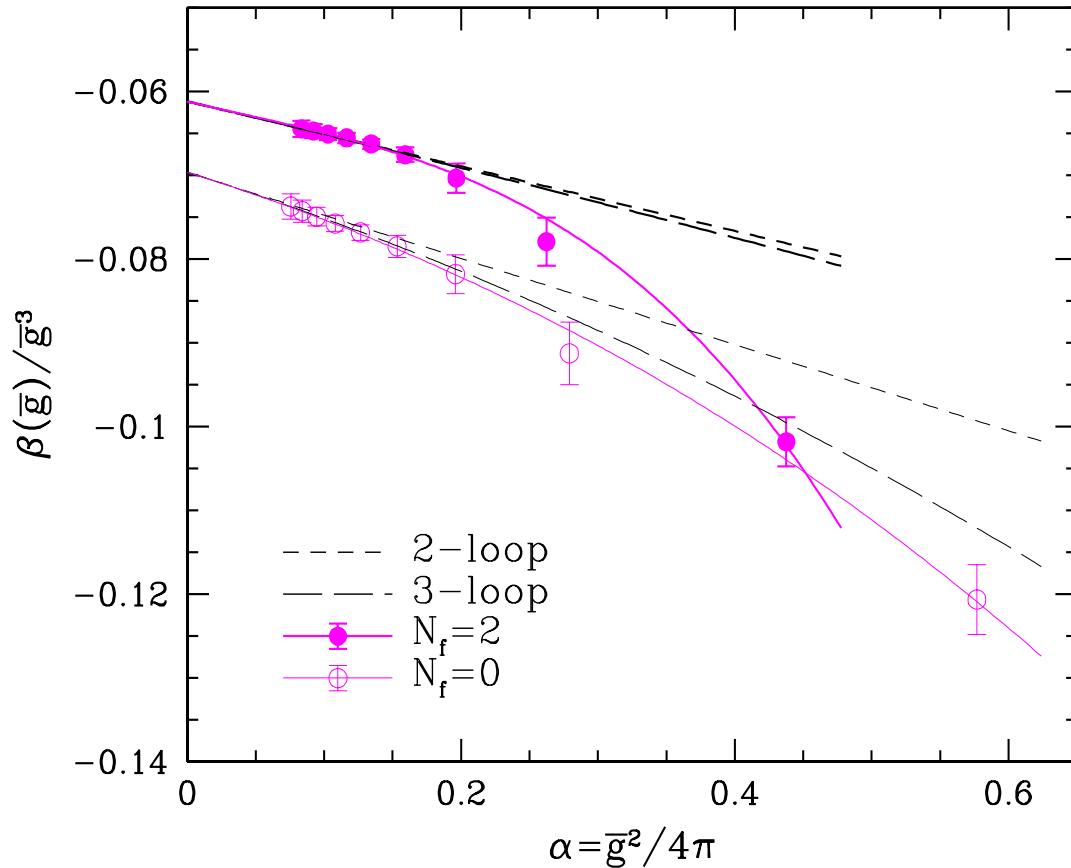
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# Nonperturbatively defined running coupling

**ALPHA**  
Collaboration  
2005



- Observe domain where PT behavior sets in!
- use PT at HE to relate to  $\overline{\text{MS}}$  scheme  
 $\rightarrow \Lambda_{\overline{\text{MS}}}^{(2)} = 245(16)(16)$  using  $r_0 = 0.5\text{fm}$



## See sea quark effects

cf Lepage et al use **rooted staggered fermions**

- At given  $g_0$ : measure e.g. a charmonium level splitting  $a\Delta$
- set  $\Delta$  to experimental value  $\rightarrow a(g_0)$
- use  $g_{\overline{\text{MS}}}(a^{-1}) = g_0 + c_1 g_0^3 + \dots$  as input for PT RG evolution