Radiative Muon Decay

$\mu \to e\nu\bar{\nu}\gamma$	Carnegie 1961 $E_\gamma > 10$ MeV	MEG 2013 $E_\gamma > 40$ MeV $E_e > 45$ MeV	PiBeta 2014 $E_\gamma > 10$ MeV $\theta_{e\gamma} > 30°$
$\mathscr{B}_{\rm EXP}$	$1.4\,(4)\cdot 10^{-2}$	$6.03\,(14)_{\rm st}(53)_{\rm sy}\cdot 10^{-8}$	$4.365\,(9)_{\rm st}(42)_{\rm sy}\cdot 10^{-3}$
$\mathscr{B}^{\rm SM}_{\rm LO}$	$1.308\cdot 10^{-2}$	$6.204\cdot 10^{-8}$	$4.264\cdot 10^{-3}$
$\mathscr{B}^{\rm SM}_{\rm Inc}$	$1.289\,(1)_{\rm th}\cdot 10^{-2}$	$5.84\,(2)_{\rm th}\cdot 10^{-8}$	$4.232\,(2)_{\rm th}\cdot 10^{-3}$
$\mathscr{B}^{\rm SM}_{\rm Exc}$	$1.286\,(1)_{\rm th}\cdot 10^{-2}$	$5.84\,(2)_{\rm th}\cdot 10^{-8}$	$4.228\,(2)_{\rm th}\cdot 10^{-3}$
		+ Spectral shapes	+ prelim $\bar{\eta} = 0.006\,(17)_{\rm st}(18)_{\rm sy}$

- **PEN analysis near completion. New exp ideas? See Khaw's talk.**
- **SM background for $\mu \to e\gamma$ and $\mu \to 3e$**
- **Very clean, can be predicted with very high precision.**
- **Full SM NLO available (RC can be large!)** Fael, Mercolli, MP 2015; Pruna, Signer, Ulrich 2017
- **TH formulation in terms of the Bouchiat-Michel-Kinoshita-Sirlin parameters allows to test couplings beyond the SM V-A**
- **The $e^\pm$ & γ spectra depend on the BMKS parameters ρ, δ, and $\bar{\eta}$**
- **Systematic BSM study in terms of dim-6 operators needed.**