Maldwyn Centre for Theoretical Physics

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His update has just a few thoughts. These are not necessarily correct, but provide some new directions that deserve future investigation.

Stack magnetic moments

Past papers have theorised how the magnetic moment of loops arise. The conclusion has been that, for example, the electron has a g=2 because of the contributions of both the one-sixth electron charge on each meon as well as the meons' own contributions due to their differing radii of rotation. The anomalous magnetic moment of the electron has not been found, although a much smaller contribution is present.

The new thought is that the charge gradient between meons at different radii might provide an additional contribution to the overall loop magnetic moment.

When considering the position of one-sixth charges around a loop, when there is a change in radius of rotation – defined as a 'bridge' – there are only four possible values. The inner radii meon always has the same sign meon and one-sixth charge because its mass and twist energies are the same sign and its larger total mass energy must be at the inner radius for equal moment as the outer lower total mass energy meon. Using 'Q' to denote the type of meon, k as the one sixth charge and the inner or outer radius by line position- all lines cut into chains travelling from right to left on the page - these are

Outer radius	<<	+Q-k	
Inner radius	<<		-Q-k

This pair is defined as '+Q Outer in Front of –Q inner' or (+oFi-)

Outer radius	<<	-Q+k	
Inner radius	<<		+Q+k

This pair is defined as '-Q Outer in Front of +Q inner' or (-oFi+)

Outer radius	<<		+Q-k
Inner radius	<<	-Q-k	

This pair is defined as '+Q Outer Behind –Q inner' or (+oBi-)

Outer radius	<<		-Q+k
Inner radius	<<	+Q+k	

This pair is defined as '-Q Outer Behind +Q inner' or (-oBi+)

Note that each pair is always 2Q different between inner and outer radii. The effect will depend on the size of the loop, which is its mass. If the loop were a straight chain, as used below to show how many and which type of bridge is in a loop, there would be no difference in the size of each bridge effect, but being in a loop there will be a difference as shown later.

Considering each loop in turn, the bridge count can be shown to be:

Electron

Outer radius	<<	+Q-k		+Q-k		+Q-k	
Inner radius	<<		-Q-k		-Q-k		-Q-k

The bridge count is 3 (+oFi-) + 3 (+oBi-) (the first and last positions together produce a bridge)

Positron

Outer radius	<<	-Q+k		-Q+k		-Q+k	
Inner radius	<<		+Q+k		+Q+k		+Q+k

The bridge count is 3 (-oFi+) + 3 (-oBi+)

Since the positron has the reverse values of all properties of the electron, it can be said that

(+oFi-) + (-oFi+) = 0 and (+oBi-) + (-oBi+) = 0

Up quark

Outer radius	<<	-Q+k		-Q+k			
Inner radius	<<		+Q+k		+Q+k	-Q-k	+Q+k

The bridge count is 2 (-oFi+) + 2 (-oBi+)

Here it does not matter where the single –k sits in the chain as it is the only asymmetry.

Down quark 2

Outer radius	<<	+Q-k					
Inner radius	<<		-Q-k	+Q+k	-Q-k	+Q+k	-Q-k

The bridge count is 1 (+oFi-) + 1 (+oBi-)

Down quark 1

Outer radius	<<	+Q-k		+Q-k			-Q+k
Inner radius	<<		-Q-k		-Q-k	+Q+k	

The bridge count is 2 (+oFi-) + 1 (+oBi-) + 1 (-oBi+)

Since (+oBi-) + (-oBi+) = 0, this can be shortened to 2 (+oFi-)

Symmetric neutrino 1

Outer radius	<<						
Inner radius	<<	+Q+k	-Q-k	+Q+k	-Q-k	+Q+k	-Q-k

There are no bridges

Symmetric neutrino 2

Outer radius	<<	+Q-k	-Q+k	+Q-k	-Q+k	+Q-k	-Q+k
Inner radius	<<						

There are no bridges

Asymmetric neutrino 1

Outer radius	<<	+Q-k			-Q+k	+Q-k	-Q+k
Inner radius	<<		-Q-k	+Q+k			

The bridge count is 1 (+oFi-) + 1 (-oBi+)

Asymmetric neutrino 2

Outer radius	<<	+Q-k			-Q+k		
Inner radius	<<		-Q-k	+Q+k		+Q+k	-Q-k

The bridge count is 1 (+oFi-) + 1 (-oBi+) + 1 (-oFi+) + 1 (+oBi-)

Given from above that (+oFi-) + (-oFi+) = 0 and (+oBi-) + (-oBi+) = 0 then

the simplified bridge count is zero.

The bridge counts for each loop can be simplified by calling (+oFi-) + (+oBi-) = [+oFBi] so that

Electron	3 [+oFBi]
Positron	-3 [+oFBi]
Up Quark	-2 [+oFBi]
Down Quark 2	1 [+oFBi]
Down Quark 1	2 (+oFi-)
Symmetric Neutrino	0
Asymmetric Neutrino 1	1 (+oFi-) + 1 (-oBi+)
Asymmetric Neutrino 2	0

If the hypothesis is that the anomalous magnetic moment of the electron at its mass Me represents the whole of the three bridges, then [+oFBi] effect must be the same sign as the magnetic moment generated by the six one-sixth charges on the meons. Similarly the -2[+oFBi]of the up quark must be the same sign as the magnetic moment of the up quark due to its charge and the [+oFBi] of the down quark the same as sign as the magnetic moment of the down quark due to its charge. So the bridges of value [+oFBi] act as if they were the same charge as their loop charge.

The further hypothesis is that the asymmetric neutrino bridge value of

1 (+oFi-) + 1 (-oBi+) = 1 (+oFi-) - 1 (+oBi-) = d

If d=0, then (+oFi-) = (+oBi-) and the loop bridge values become

Electron	6 (+oFi-)
Positron	-6 (+oFi-)
Up Quark	-4 (+oFi-)
Down Quark 2	2 (+oFi-)
Down Quark 1	2 (+oFi-)
Symmetric Neutrino	0
Asymmetric Neutrino 1	0
Asymmetric Neutrino 2	0

This assumption simplifies values and means that there is only one type of each loop to consider for bridge values in a proton or neutron stack.

To build a nucleon stack requires that all loops (possibly bar the electron in the neutron) are the same size and that the spins alternate down the stack. Provided d=0, there is no need to consider whether the stack is 5, 7 or 9 loops tall.

The analysis of the assumptions starts with assuming that the bridges have no effect and that d=0. This simply shows that the loops in the core of the proton and neutron stacks have values, in terms of each standard respective magnetic moment (ignoring that the loops themselves are specific fractions of the total nucleon masses), of

	Proton	Neutron
Up quark	1.11713894	1.11669151
Down quark	0.55856947	0.558345755
Up quark	1.11713894	1.11669151
Neutrino	0	0
Electron	0	-4.704771506
Total	2.792847351	-1.91304273

Here the electron is considerably different in physical size (rotational rate) that it is unlikely to remain within the stack due to the difficulty in retaining rotational symmetry with the other stack loops. Also that the down quark has the same sign of moment as the up quark because the former rotates oppositely to the latter - another way of saying that one will be + ½ h and the other – ½ h.

Including values for the effect of bridges can be split into two cases. The first is when the moment due to the rotation of the one-sixth charges is opposite to the effect of the bridges. This takes into account that the anomalous magnetic moment of the free electron may not be due to the bridges.

Taken towards the limit where the relative sizes of the up quark and electron in the neutron stack approach one, and the bridges have signs opposite to their one-sixth charge effects, the moments could be

	Proton	Neutron
Up quark	8694.968931	8691.486473
Down quark	4347.484466	4345.743237
Up quark	8694.968931	8691.486473
Up bridges	-8693.851792	-8690.369782
Down bridges	-4346.925896	-4345.184891
Up bridges	-8693.851792	-8690.369782
Neutrino	0	0
Neutrino bridges	0	0
Electron	0	-13040.259444
Electron bridges	0	13035.554673
Total	2.792847351	-1.91304273

The ratio of electron to stack loop sizes here is 1.000232391, so that the electron, even approaching a very high bridge value, can never be stable within a neutron stack. The ratio will never be exactly one, so the electron will never be able to retain rotational symmetry relative to the remaining stack, even though it does not have threefold asymmetry. Its threefold symmetry is enough only to allow external fields to keep it within the stack for an extended period.

The values shown above use bridge factor 1 [+oFBi] of 1.83637E-50 in units of the product of actual magnetic moment and mass of the proton.

Note that, although not shown specifically here, because d=0, the two different bridge components of the down quark have the same value.

A more likely set of values, using bridge factor 1 [+oFBi] of -2.00E-54 is the following

	Proton	Neutron
Up quark	1.353852	1.352149693
Down quark	0.676926	0.676074846
Up quark	1.353852	1.352149693
Up bridges	-0.236713	-0.236415105
Down bridges	-0.118356	-0.118207552
Up bridges	-0.236713	-0.236415105
Neutrino	0	0
Neutrino bridges	0	0
Electron	0	-5.056414
Electron bridges	0	0.354035
Total	2.792847351	-1.91304273

The second case for stacks is when the moment due to the rotation of the one-sixth charges is the same as the effect of the bridges. The following values are possible using the same size but opposite sign bridge factor 1 [+oFBi] of 2.00E-54

	Proton	Neutron
Up quark	0.880426	0.879319484
Down quark	0.440213	0.439659742
Up quark	0.880426	0.879319484
Up bridges	0.236713	0.236415105
Down bridges	0.118356	0.118207552
Up bridges	0.236713	0.236415105
Neutrino	0	0
Neutrino bridges	0	0
Electron	0	-4.348344
Electron bridges	0	-0.354035
Total	2.792847351	-1.91304273

Once more, the electron loop size is not the same as the rest of the stack loops, so it will not be held strongly in place.

The conclusion is that there is no stable permanent retention of the electron (in its larger mass, smaller loop size identity) within a free neutron stack due to internal symmetry forces. The retention must be due to external forces whilst held with other nucleons in a nucleus.

The consideration of the value of $d \neq 0$ has not yet been considered as it brings more complex possible stack dynamics. With a non-zero d, there will then exist asymmetric neutrinos with small magnetic moments and thus small observable masses alongside symmetric and asymmetric neutrinos with zero magnetic moments.

The existence on neutrinos with non-zero magnetic moments would then enable them to be better retained within a nucleon stack than those with zero magnetic moments. Furthermore, the stack structure would be more likely to be nine loops in total, with three neutrinos at one end of the stack and three anti-neutrinos at the other end. The elimination of the electron from a neutron stack would then require that the difference between their respective magnetic moments be taken into account, rather than just the value of the electron's only.

Overall, the value of the anomalous magnetic moment of the electron, translated into proton and neutron bridges of 7.535874E-53 and 7.545359E-53 respectively only allows for stacks where the rotation of the one-sixth charges produces and opposite sign magnetic moment to that of the bridges. So the anomalous magnetic moment is not only due to the electron's bridges.

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