It just occurred to me that the A tensor might be the sum of the symmetric metric tensor and the skew-symmetric EM field tensor in STR. That would make sense in terms of the Helmholtz decomposition as well (not sure about this, but a possible starting point.)

(The skew-symmetric EM tensor has a null trace, with the mass/energy assigned to the metric tensor which is diagonal in the case of the Minkowski metric....) That is, it seems to me the Minkowski metric operates exclusively in Energy-Momentum space, and not space-time. (If the vector potential is zero, the Minkowski metric has only one dimension - rest energy....)

That would account for the extra A term in the QCD equation (which I interpret to represent environmental mass created by the collision into color charges related to 3 dimensions of space-time, which dissipates back after the collision. Asymptotic confinement, since the total energy cannot exceed particle/field energy + environment. (By environment, I mean absolute Fermi level (which is ignored in STR, since only differences in A are considered) as opposed to local Fermi level.

I'll think on it some more; if I'm crazy, then it it is alright with me....

To be developed....

1. Maxwell's equations and the Lorentz transform
2. Maxwell's equations and the Scalar/Vector Potentials
3. QED and QFT...... (Probability/Many Body Analysis, Green's functions, light cones, etc....)
4. Application to QCD (and extension to Gravity via Many-body analysis)

===
This is just a reminder to myself as to where I am going with all of this....

http://www.fuw.edu.pl/~dobaczew/maub-42w/node9.html

$$\mathcal{L} = -\tfrac{1}{4}F^{\alpha}_{\mu\nu}F^{\mu\nu}_{\alpha} - \sum_n \bar{\psi}_n \gamma^{\mu}[\partial_\mu - igA^{\alpha}_{\mu}t_\alpha]\psi_n - \sum_n m_n \bar{\psi}_n \psi_n$$

I am happy to report that Quantum Chromodynamics finally makes sense (sort of, to me, anyway).

For me, the key was in an in-depth analysis of the Scalar/Vector potential, which is used to convert Maxell's Equations from continuous functions in space-time to a four vector in relativistic energy-momentum space (the A field). The scalar potential (which is relativistic mass in space-time) is divided by c in order to remove the energy content in the time dimension, and relativistic momentum is added in the "space" dimension.. (this restores the energy content to the three "Energy-Momentum" dimensions related to space-time via STR.)

The Electro-magnetic field tensor is then recovered by subtracting the E-P elements from the A field (which leaves the resulting electromagnetic tensor with a 0 trace; i.e., the EM field has zero mass, consistent with the classical viewpoint. This is carried through all the way through QFT, with the relativistic masses added to the EM field portion in the LaGrangian... (multiplied by q to get the charge-mass ratio).

In QCD, it seems to me that the addition of the Linear term in A adds this "environmental" mass back to the center-of-mass frame, which reflects the three dimensions of the experimental environment (with E aligned with the tracks of the colliding particles), separating the total energy into vectors in three dimensions at impact, which resolve back to particle streams as the "glueball" subsides back to environmental levels (thus the quark "particles"/"jets" only exist until this happens and the total collision energy "dissolves" back out to ambient levels. So quarks only exist during the lifetime of the collision, and cannot exceed the collision energy - the total energy acts as a restoring tension.

The key to seeing this is the whole progression from the Lorenz/Lorentz transform (they are different) through STR (not involving EM), through QED (transition from particles to fields in four-space) to QCD.

Not only that, but my suspicion is that I won't need calculus for an analysis of a single particle (since probabilities are not involved) - I bet everything can be described in terms of constant coefficients.... Calculus may only be needed for gravity (if inertial mass is equivalent to electromagnetic mass, then one just changes the "speed/energy" of light for equivalent "Fermi" levels within the universe.......

I just came to this this morning (and I may be completely mad), but wanted to get this thought out before I write it up on my site. (I just got involved in an "emergency stop" on my motorcycle, and broke 5 ribs... sheesh.. "If everything is going smoothly, you're going to slow" - Mario Andretti.

On the other hand, if I am right, then so are all the other guys.... I think, anyway....