Fractional Charge

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ABSTRACT: Certain aspects of fractional charge have been discussed.

The quark has three charges: electromagnetic, color and flavor; correspondingly n=2, n=3 and n=6.
We have:

$$m = Q_0 \left| e^{i\left(\frac{2k\pi}{n} + \varphi\right)} \right| \qquad k = 0, \ldots n-1$$

The same equation is expressed by the formula:

$$m = Q_{elmagn} \left| e^{i\left(\frac{2k\pi}{2} + \varphi_1\right)} \right| + Q_{color} \left| e^{i\left(\frac{2k\pi}{3} + \varphi_2\right)} \right| + Q_{flavor} \left| e^{i\left(\frac{2k\pi}{6} + \varphi_3\right)} \right|$$

and by charges possibly yet not discovered.

The fractional electromagnetic charge of quarks is taken under consideration by Q_0. Here $Q_{elmagn\,quark} = \frac{1}{3} Q_0$ or $Q_{elmagn\,quark} = \frac{2}{3} Q_0$, correspondingly to different formulas of quarks (because each quark has either the charge $\pm\frac{1}{3}e$ or $\pm\frac{2}{3}e$, never both!)
The discovery by S. B. Laughin, H. L. Störmer and D. C. Tsui [1] concerning the statement that the quantum liquid has the excitations with the fractional charges testifies to that the quark-gluon soup is just such quantum liquid.

Reference:

[1] S. B. Laughin, H. L. Störmer and D. C. Tsui, *Internet: List of the Nobel Prize Winners.*