

# The Structure, Properties and Parameters Of Nucleons

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**Abstract:** according to the basic theory of nuclear and particle physics, and related measurement results and experimental data, showing the structure, properties and parameters of nucleons.

## Main viewpoints and conclusions:

We already have known a nucleus is composed of the nucleons, therefore, giving and determining their structure, properties and parameters are the works which should to be,

A proton is one kind of the most elementary particles; it with a unit positive charge.

A  $\pi$ -meson is compounded of an electron and a neutrino; since an electron with a unit negative charge and a neutrino is has no any charge, then the  $\pi$ -meson which compounded by them has a unit negative charge. <sup>[1]</sup>

A neutron is compounded of a proton and a  $\pi$ -meson, and the  $\pi$ -meson as a shell and afterbirth, in the form of Soft electric-charged matter, covered and wrapped with the proton. <sup>[1]</sup>

And:	$m_{\pi} = m_e + m_{\nu};$	$m_n = m_p + m_{\pi} = m_p + m_e + m_{\nu}.$
	$m_n = 1.00866491682 \text{ u};$	$m_p = 1.00727647012 \text{ u};$
	$m_e = 0.0005485799 \text{ u}.$	
Even:	$m_{\pi} = 0.0013884467 \text{ u};$	$m_{\nu} = 0.0008398688 \text{ u};$
	$m_{\pi} \approx 2.53 m_e;$	$m_{\nu} \approx 1.53 m_e.$
And:	$r_p = 0.3 \text{ fm};$ <sup>[2]</sup>	$r_n = 2.0 \text{ fm}.$ <sup>[2]</sup>

Moreover, there be the thickness of the outer  $\pi$ -meson layer of a neutron is 1.7 fm; the neutron's cross-section is two concentric circles with radius in 0.3 fm and 2.0 fm (an experimental result and data shown a neutron has a positively charged core of radius about 0.3 fm surrounded by compensating negative charge between 0.3 and 2.0 fm <sup>[2]</sup>).

## References

[1] *A New Model of the Neutron Based on  $\pi$ -mesons*

<http://rxiv.org/abs/1405.0206>

[2] J.-L. Basdevant, J. Rich, M. Spiro, *Fundamentals in Nuclear Physics*, 2005, Springer, p.156