1046-41-1679 **Valerio De Angelis*** (`vdeangel@xula.edu`), Mathematics Department, Xavier University of Louisiana, 1, Drexel Drive, New Orleans, LA 70125. *Another look at the Stirling series.*

We present a concise and elementary derivation of the complete asymptotic expansion for the factorial function $n!$, that we will refer to as the Stirling's series. While there have been numerous published proofs of the Stirling's series and of its classical dominant term given by Stirling's formula

$$\lim_{n \to \infty} \frac{n! e^n}{n^n \sqrt{2\pi n}} = 1,$$

the present treatment produces some new expressions for the coefficients. In addition, it brings to light the simple relationship between the asymptotic expansions of $n!$ and $1/n!$ that, even though easily derived from the well-known expansion of $\log \Gamma(z)$ in terms of the Bernoulli numbers, seems to have no simple published proof. (Received September 16, 2008)

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