Bailey, Borwein, and Plouffe in the article "On the Rapid Computation of Various Polylogarithmic Constants" give the following formula for $\pi$, which allows the computation of an individual binary digit in the binary expansion of $\pi$ with small storage:

$$
\pi = \sum_{i=0}^{\infty} \frac{1}{16^i} \left( \frac{4}{8i+1} - \frac{2}{8i+4} - \frac{1}{8i+5} - \frac{1}{8i+6} \right)
$$

Erich Kaltofen and C. Ryan Vinroot, following their integer relation approach (re)-discovered the following alternate formula:

$$
2\pi = \sum_{i=0}^{\infty} \frac{1}{16^i} \left( \frac{8}{8i+2} + \frac{4}{8i+3} + \frac{4}{8i+4} - \frac{1}{8i+7} \right)
$$

A Maple V.4 session showing our derivation is here. This session can be loaded as Maple text and executed.

Adamchik and Wagon [Am. Math. Monthly, Nov. 1997; url] give the following pretty variant:

$$
\pi = \sum_{j=0}^{\infty} \frac{(-1)^j}{4^j} \left( \frac{2}{4j+1} + \frac{2}{4j+2} + \frac{1}{4j+3} \right)
$$

Their solution is dependent on the two given above as follows:

$$
4\pi = \sum_{k=0}^{\infty} \frac{1}{4^{2k}} \left( \frac{8}{8k+1} + \frac{8}{8k+2} + \frac{4}{8k+3} \right) - \sum_{k=0}^{\infty} \frac{4}{4^{2k+1}} \left( \frac{2}{8k+5} + \frac{2}{8k+6} + \frac{1}{8k+7} \right)
$$

which is 2 times BBP plus 1 times our variant.

Fabrice Bellard has given a formula for base $2^{10}$, which allows a faster algorithm for computing the hexadecimal digits of $\pi$. 