it is clear that the highest spin state in a shell has the lowest energy.

Proposed shell structure:

\( n = 0 \)  \quad N_{2n+1} = 2

\( n = 1 \)  \quad N = 8

\( n = 2 \)  \quad N = 20

\( n = 3, j = \frac{3}{2} \)  \quad N = 28

\( n = 4, j = \frac{5}{2}, \frac{3}{2}, \frac{5}{2} \)  \quad N = 50

\( n = 5, j = \frac{7}{2}, \frac{5}{2}, \frac{5}{2}, \frac{7}{2} \)  \quad N = 112, \frac{13}{2}

\( n = 6, \frac{13}{2} \)  \quad N = 112 + 14 = 126