1043-20-143 **Luise-Charlotte Kappe** (menger@math.binghamton.edu), Department of Mathematical Sciences, State University of New York at Binghamton, Binghamton, NY 13902-6000, and **Joanne L Redden*** (mathprofessor@mac.com), Department of Mathematics, Elmira College, One Park Place, Elmira, NY 14901. *On the Covering Number of Small Alternating Groups.*

According to Bernhard Neuman, every group with a noncyclic finite homomorphic image is the union of finitely many proper subgroups. The minimal number of subgroups needed to cover a group G is called the covering number of G, denoted by $\sigma(G)$. Tomkinson showed that for a solvable group $\sigma(G) = p^\alpha$ where p^α is the order of a particular chief factor of G and he suggested investigation of $\sigma(G)$ for families of finite simple groups. So far, a few results are known, among them some for alternating groups. Cohn showed that $\sigma(A_5) = 10$ and by a result of Maróti $\sigma(A_n) \leq 2^{n-2}$, provided $n \neq 7$ or 9, and equality holds for n even with $n \equiv 2 \mod 4$. Thus, $\sigma(A_6) = 16$ and $\sigma(A_{10}) = 256$. We show that $\sigma(A_7) = 31$ and with the help of GAP improve on Maróti's estimates for $\sigma(A_8)$ and $\sigma(A_9)$. (Received August 25, 2008)