1145-00-2341      **Alan S Perelson\*** (`asp@lanl.gov`), Theoretical Division, MS-K710, Los Alamos National Laboratory, Los Alamos, NM 87545. *Immunology for Mathematicians.*

The immune system is a complex distributed system of interacting cells and molecules that learns, exhibits memory and most importantly protects us from infectious disease. While we are still uncovering how the immune system works, I will show through a variety of examples that it provides a fertile ground for interesting mathematical problems, from the understanding of how the immune system can recognize an almost limitless number of pathogens including some never seen before in all of evolutionary history, to the design of computer immune systems to protect against computer viruses, to the choice of next season's flu vaccine. (Received September 25, 2018)