ATM515 **Aerosol Physics**, Fall 2025

Midterm Exam

1. Close book and notes but the student may bring one, 8.5” x 11” sheet of handwritten notes (both sides; no copied text, inserted graphics, cut and paste figures, etc.) into the exam. The sheet must be turned in with the student’s answers.

2. Bring a simple calculator.

A summary of main knowledge points covered so far

1. Aerosol (various) properties and their associations with various aerosol environmental and climatic impacts;
2. Particle number and mass size distributions, dominance of particle number and mass concentrations by particles of different size ranges;
3. Atmospheric aerosols are particles suspended in air. Particle behaviors depend on properties of air molecules. Typical values of key characteristics/parameters of gas molecules;
4. Particles in kinetic (free molecule), continuum, and transition regimes;

5. Dynamics of single aerosol particles;
6. Particle microphysical processes and their impacts on particle number and mass concentrations;
7. Nucleation or new particle formation: underlying physical or chemical principles, various nucleation theories, key controlling parameters;
8. Importance of new particle formation, feedback processes involving new particle formation;
9. Condensation and evaporation, particle growth rates.