AME 60636
Homework 1
Due: Wednesday, 19 January 2022, noon, on Sakai

Consider the problem of Oxygen dissociation and recombination that was performed in lecture.

1. Write a code in `Fortran 90` to reproduce the results obtained in lecture for initial concentrations $\hat{\overline{\rho}}_{O_2} = 0.001$ mole/cm^3, $\hat{\overline{\rho}}_{O} = 0.001$ mole/cm^3, $T = 5000$ K for the two step mechanism using reactions 13 and 14 in the *CTM* paper found in the documents section of the course home page. Give plots of concentration versus time and pressure versus time. You can compare your results to those obtained via the `Mathematica` code for this problem which is available in the documents section of the course home page. I have placed an example `Fortran 90` code and `MATLAB` plotting code of the documents home page which you can use as a template. The example `Fortran 90` code happens to solve a mass spring damper system using any of a variety of Runge-Kutta ODE solvers.

2. For the same initial conditions, generate a plot of how the equilibrium concentrations of O and O_2 vary with temperature.