PROJECT INTRODUCTION

- A particle system is a convenient representation of a natural phenomena
- The natural phenomena to be reproduced are Smoke and Flames
- Creation of a pseudo-realistic scene simulating physics using random factors in the particles motion

SMOKE

- Smoke is a collection of airborne solid and liquid particulates and gases emitted when a material undergoes combustion or pyrolysis.

- Smoke shape follows the standard convection-diffusion equation:
  $\partial C/\partial t+\vec{\mathbf{u}} \cdot \nabla C=D\nabla^2 C$
  where C is the smoke concentration and D is the diffusion coefficient of smoke.

- Smoke coming from a candle has a higher temperature than the surrounding, giving it lower density, which makes it rise. As it rises, it cools down, which also decrease the net force on the smoke particle. At the same time hotter smoke from below hits the smoke that is more stagnant causing random movements.