

# 1. Project Setup

1. Project Title: A Tiny World: Atom Simulation/Rendering

2. Members and Roles:

Chung An, Chen (Andy), 5120AG05-1

Software Development, Final Report, Team Management

Yang, Liu, 5121FG59

Software Development, Setting Up Demo, Slides

LinXi, Tao, 5121FG25

Material Research, Slides, Final Report

3. Project Timeline:

12/12 - 12/15 Project Initiation (Done)

Decided to go with an Atom Simulation/Rendering

Backup option: Fluid simulations

12/15 - 12/18 Project Development Tool Investigation (Done)

Decided to use **Taichi**, a Domain-specific-language (DSL) written in Python and C++ for graphical simulations, as our main development tool

12/18 - 12/24 Tinkering and Experimenting with **Taichi** and Finalizing Our Initial Report

12/24 - 1/01 Creating Several Prototypes

1/01 - 1/14 Finalizing the Prototype and Refining It

1/14 - 1/17 Setting Up a Demo Server/Host

1/17 - 1/31 Creating Slides for the Presentation and Putting together Our Final Report

# 2. Project Description

This project aims to simulate and render an atom's presence in a three-dimensional space. The simulation will be grounded on the more accurate electron cloud model, shown in Figure 1 below. An electron cloud model depicts the occurrence of an atom's electrons by a density map containing numerous sparse dots. In any region, the density of the dots draws a directly proportional relationship to the probability of an electron being present. To make this feasible, We leverage a recently-built parallel programming language, namely **Taichi**, as our main development framework.

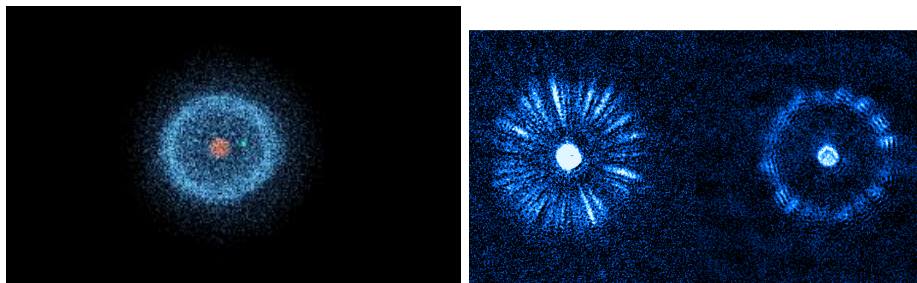


Figure 1: Atoms and Their Nucleus and Electron Cloud