HydrogenAtomSimulations

Welcome to **HydrogenAtomSimulations**, a comprehensive repository designed to explore and simulate the quantum mechanical properties of the hydrogen atom. This repository includes Jupyter notebooks and other resources that delve into the radial wave functions, spherical harmonics, and their applications in understanding the hydrogen atom.

Overview

This repository focuses on the quantum mechanics of the hydrogen atom, specifically:
- **Radial Wave Functions**: Detailed simulations and calculations of radial wave functions for different energy levels.
- **Spherical Harmonics**: Visualization and analysis of spherical harmonics associated with the hydrogen atom.
- **Quantum Mechanics Principles**: Theoretical explanations and practical implementations that showcase quantum mechanics in action.

Getting Started

To get started with the simulations:
1. Clone the repository:
```
git clone https://github.com/yourusername/HydrogenAtomSimulations.git
```
2. Install the required Python packages:
```
pip install -r requirements.txt
```
3. Navigate to the notebook directory and run the Jupyter notebooks:
```
jupyter notebook
```

```

**Contents**

- **RadialWaveFunction.ipynb**: Explore the calculation and visualization of radial wave functions for the hydrogen atom.
- **SphericalHarmonics.ipynb**: Analyze how spherical harmonics play a role in the quantum states of the hydrogen atom.
- Additional scripts and datasets used for computations and visualizations.

## License

This project is licensed under the MIT License - see the [LICENSE.md](LICENSE.md) file for details.
```