Hydrodynamics is the branch of physics that deals with the study of fluids in motion, specifically the behavior of water and other liquids. It focuses on understanding how forces, pressures, and velocities influence the flow of fluids, as well as how fluids interact with their surroundings.

Hydrodynamics has many applications, including:

1. **Fluid Flow**: Describing the movement of fluids, such as water through pipes, rivers, or around objects (like ships or submarines). 2. **Engineering and Design**: Used in the design of boats, ships, airplanes, and dams to optimize fluid behavior for efficiency and safety. 3. **Environmental Science**: Understanding the movement of oceans, rivers, and lakes, as well as the impact of fluid flows on ecosystems. 4. **Aerodynamics**: A subfield closely related to hydrodynamics, concerned with gases (especially air), but based on similar principles.

The equations governing hydrodynamics are typically derived from the laws of motion (especially Newton’s second law) and fluid properties like viscosity, density, and compressibility. The Navier-Stokes equations are central in describing the behavior of viscous fluids in motion.