The Institute for Shock Physics (ISP) is a multi-disciplinary research organization with an emphasis on shock wave and high pressure research on materials. The research activities involve examining and understanding physical and chemical changes in solids and liquids under very rapid and large compressions / deformations. Shock wave research at Washington State University was started in the late 1950s in the Department of Physics and experimental work was initiated in 1968.

**Who We Are**

The Institute for Shock Physics is a national resource in shock wave and high pressure science and related areas through scientific innovations and rigorous education. This vision is achieved through the following objectives:

- Emphasis on innovative research, scientific excellence, and programmatic relevance
- Education and training of outstanding graduate students and postdoctoral associates
- Participation of undergraduate students in scientific and technical activities
- Strong partnerships with the Department of Energy/NNSA Laboratories
- Continued strong participation in the Department of Defense programs
- Development of non-defense and commercial applications

**Scientific Theme and Approach**

Continuum-to-atomic scale understanding of the dynamic response of materials:

- Atomic-to-continuum scale understanding of the physical and chemical response of materials
- Multidisciplinary research (physics, chemistry, materials science, mechanics)
- Fundamental understanding through real-time measurements at different length scales
- Novel experimental developments
- Computations at different length scales
- Strong coupling of dynamic and static pressure research

**Representative Research Activities**

- Strength and fracture studies in metals, metallic glasses, and composites
- Chemical decomposition: PETN, RDX
- Compression failure in brittle solids
- Optical properties of semiconductors
- Continuum and mesoscale modeling
- Quantum chemistry calculations
- X-ray diffraction studies of phase changes
- Spectroscopy in molecular crystals
- Mechanistic understanding of HE sensitivity

**Representative Landmark Research**

- Continuum and mesoscale modeling
- Quantum chemistry calculations
- X-ray diffraction studies of phase changes
- Spectroscopy in molecular crystals
- Mechanistic understanding of HE sensitivity

**Vision and Goals**

National resource in shock wave and high pressure science and related areas through scientific innovations and rigorous education. This vision is achieved through the following objectives:

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**Major Research Facilities**

- Impact Laboratory
- Laser Shock Laboratory
- Static High Pressure Laboratory
- Compact Pulsed Power Laboratory
- Theory and Computations

*Supported by the Department of Energy*