

# Loewy Institute

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Loewy Institute (formerly Institute for Metal Forming) 5 E. Packer Avenue; 758-4252

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The Loewy Institute continues tradition of the Institute for Metal Forming, which was established in 1970 to teach the principles and applications of metal forming technology to graduate and undergraduate students, to provide instructions and equipment for graduate research in metal forming processes, and to assist industry with solutions to problems in metal forming.

The main objective of the institute's research is to conduct cross-disciplinary process engineering studies to better understand and control manufacturing processes and their impact on the microstructural response of a material. The material microstructure developed during processing is responsible for physical properties of the material. Recently, classical metal forming research has been expanded to include projects in powder processing including additive manufacturing, microstructure characterization and analysis, as well as forming and processing technologies for polymers, glasses, and ceramics and nanomaterials.

The study of the forming processes encompasses physical and numerical modeling; simulation of microstructure response to process parameters. Computer enhanced analysis of material flow also allows us to optimize tooling design in many manufacturing processes. The combined quantitative results of these techniques may then be compared with experimental data obtained from instrumented metal forming laboratories (such as those maintained at the institute), or from our research partners in industry.

## RESEARCH ACTIVITIES

Current research areas include: deformation and processing of metals, metal and ceramic powders, light-optical and electron-optical micro-texture characterization, tooling design and tooling materials, thermo-mechanical processing of metals, rapid prototyping and rapid tooling aka additive manufacturing, and machinability of the sintered powder materials. Additionally new research projects have been initiated in development of materials for medical and energy applications.

## EDUCATIONAL OPPORTUNITIES

Students interested in metal forming should refer to course offerings in the departments of materials science and engineering, mechanical engineering and mechanics, and industrial and manufacturing systems engineering.

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