

Geophysical Year (1957–1958). As the Navy program struggled, JPL rejoined the race with the Army's Redstone Arsenal and soon was first in the United States to put a satellite in space (following the Soviet Union's Sputnik).

As JPL set a new course in exploring other planets in the solar system, a new drama emerged with the introduction of machine computers. Holt adequately explains how the women grappled with losing their jobs to automation.

I queried my father, a retired geophysicist, about whether he had come across such women computers in his career. "Yes, of course, we had them at Penn State when I was in graduate school (in the early 1960s). We would give them the calculations for our work, and they would hand back the results. They knew how to run those Friedan computers." One

woman was very talented and ultimately co-authored a paper with my father. Aside from a few such examples, the women computers remained in the background performing calculations.

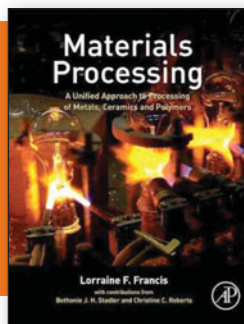
JPL's history with having women computers is still part of its lab culture today; JPL has a relatively high percentage of women engineers. Holt brings all the women together for a reunion—with all but one retired, it was a tearful and joyful event. These women had a lot to be proud of in how they contributed to space research. The fact that they did not boast about their accomplishments is also in line with the space culture, where the ratio of scientists/engineers to famous astronauts is literally in the range of 10,000 to 1.

The reader will get a different perspective about the space race. However, additional reference books are needed

to help understand how all of the subsequent deep space programs fit together. A graph showing the programs' names and the women who worked in them would have been helpful. The writing in the book often wanders aimlessly and could have been improved with additional editing.

While the book could have had a larger impact by going into more details about the technical work and by giving a better perspective on the computing roles for women, Holt manages to capture a history of women in science and engineering that is informative and comprehensive.

Reviewer: Karen Swider Lyons *researches fuel-cell and battery materials and their integration into naval systems in Alexandria, Va., USA.*



**Materials Processing:
A Unified Approach to Processing of
Metals, Ceramics and Polymers**

Lorraine F. Francis

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This book is an excellent introduction to materials processing for students, researchers, and newcomers to the field. It covers a combination of fundamentals and applications of materials science and engineering, and provides students with comprehensive knowledge supported by solved examples and problems.

Chapter 1 is an introduction to the field of materials processing and provides an overview of metals, ceramics, and polymers. Chapter 2 deals with the preparation, formulation, and characterization of the starting materials for processing. Chapter 3 details the fundamentals and

processing of converting melt to solids; heat transfer through the melting process; solidification; and different types of casting and post-casting processes for metals and glasses. The chapter also includes fundamentals and theoretical background of the extrusion and injection molding processes. Chapter 4 describes the solid deformation processes of metals, polymers, and ceramics, such as deformation under uniaxial tension, deformation with friction, wire drawing, direct extrusion, indirect extrusion, impact extrusion, forging, rolling, bending, thermoforming, and superplastic forming processes.

Chapter 5 covers the fabrication, necessary characterization and investigation of different types of powders, compaction under cold or hot conditions, the fundamentals of solid-state sintering, and the full densification process by cold and hot isostatic pressing. Chapter 6 explains the dispersion and stability of colloidal solutions, the curing of liquid monomers, the different types of shape casting of ceramics and polymers, extrusion, and powder injection molding of ceramics and polymers. The last chapter describes the thermodynamics of vapor processes, thin-film formation, epitaxial growth of single crystals, evaporation of metals and their alloys, the different types of sputtering techniques, and chemical vapor deposition processes.

Overall, this book will serve as an important addition to the libraries of those interested in materials processing and will stimulate a new generation of materials processing techniques.

Reviewer: Walid M. Daoush *of Helwan University, Egypt.*

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