



# Principles of Plasma Discharges and Materials Processing , 2nd Edition

By Michael A. Lieberman, Alan J. Lichtenberg

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**Principles of Plasma Discharges and Materials Processing , 2nd Edition** By Michael A. Lieberman, Alan J. Lichtenberg

A Thorough Update of the Industry Classic on Principles of Plasma Processing

The first edition of Principles of Plasma Discharges and Materials Processing, published over a decade ago, was lauded for its complete treatment of both basic plasma physics and industrial plasma processing, quickly becoming the primary reference for students and professionals.

The Second Edition has been carefully updated and revised to reflect recent developments in the field and to further clarify the presentation of basic principles. Along with in-depth coverage of the fundamentals of plasma physics and chemistry, the authors apply basic theory to plasma discharges, including calculations of plasma parameters and the scaling of plasma parameters with control parameters.

New and expanded topics include:

- \* Updated cross sections
- \* Diffusion and diffusion solutions
- \* Generalized Bohm criteria
- \* Expanded treatment of dc sheaths
- \* Langmuir probes in time-varying fields
- \* Electronegative discharges
- \* Pulsed power discharges
- \* Dual frequency discharges
- \* High-density rf sheaths and ion energy distributions
- \* Hysteresis and instabilities
- \* Helicon discharges
- \* Hollow cathode discharges
- \* Ionized physical vapor deposition
- \* Differential substrate charging

With new chapters on dusty plasmas and the kinetic theory of discharges, graduate students and researchers in the field of plasma processing should find this new edition more valuable than ever.

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## **Editorial Review**

### Review

"The authors have done an excellent job...this is a good book for an academic course that will provide the foundation to senior-level and graduate students..." (*MRS Bulletin*, November 2005)

### From the Back Cover

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### About the Author

MICHAEL A. LIEBERMAN, PhD, is Professor in the Graduate School in Electrical Engineering at the University of California, Berkeley. He has published more than 170 journal articles on the topics of plasmas, plasma processing, and nonlinear dynamics. He has also coauthored, with Professor Lichtenberg, *Regular and Stochastic Motion and Regular and Chaotic Dynamics, Second Edition*.

ALLAN J. LICHTENBERG, PhD, is Professor in the Graduate School in Electrical Engineering at the University of California, Berkeley. A respected pioneer in the fields of high-temperature plasmas, plasma

discharges, and nonlinear dynamics, he has published about 150 articles in these areas. In addition to the books coauthored with Professor Lieberman, he has written an earlier monograph Phase-Space Dynamics of Particles (Wiley).

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