



Computational Plasma Physics: With Applications To Fusion And Astrophysics (Frontiers in Physics)

By Toshi Tajima

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The physics of plasmas is an extremely rich and complex subject as the variety of topics addressed in this book demonstrates. This richness and complexity demands new and powerful techniques for investigating plasma physics. An outgrowth from his graduate course teaching, now with corrections, Tajima's text provides not only a lucid introduction to computational plasma physics, but also offers the reader many examples of the way numerical modeling, properly handled, can provide valuable physical understanding of the nonlinear aspects so often encountered in both laboratory and astrophysical plasmas. Included here are computational methods for modern nonlinear physics as applied to hydrodynamic turbulence, solitons, fast reconnection of magnetic fields, anomalous transports, dynamics of the sun, and more. The text contains examples of problems now solved using computational techniques including those concerning finite-size particles, spectral techniques, implicit differencing, gyrokinetic approaches, and particle simulation.

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Computational Plasma Physics: With Applications To Fusion And Astrophysics (Frontiers in Physics)
By Toshi Tajima Bibliography

- Sales Rank: #2792598 in Books
- Brand: Brand: Westview Press
- Published on: 2004-02-13
- Original language: English
- Number of items: 1
- Dimensions: 9.00" h x 1.19" w x 6.00" l, 1.69 pounds
- Binding: Paperback
- 528 pages

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Editorial Review

About the Author

Toshiki Tajima is Director General at the Kansai Research Establishment, Japan Atomic Energy Research Institute in Kyoto. He was formerly the Jane and Roland Blumberg Professor in Theoretical Physics at the University of Texas at Austin. His research interests include accelerator physics and computational physics. He is co-author with Kazunari Shibata, of *Plasma Astrophysics*.

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