PHYSICS TEXTBOOK

Stacey

Weston M. Stacey

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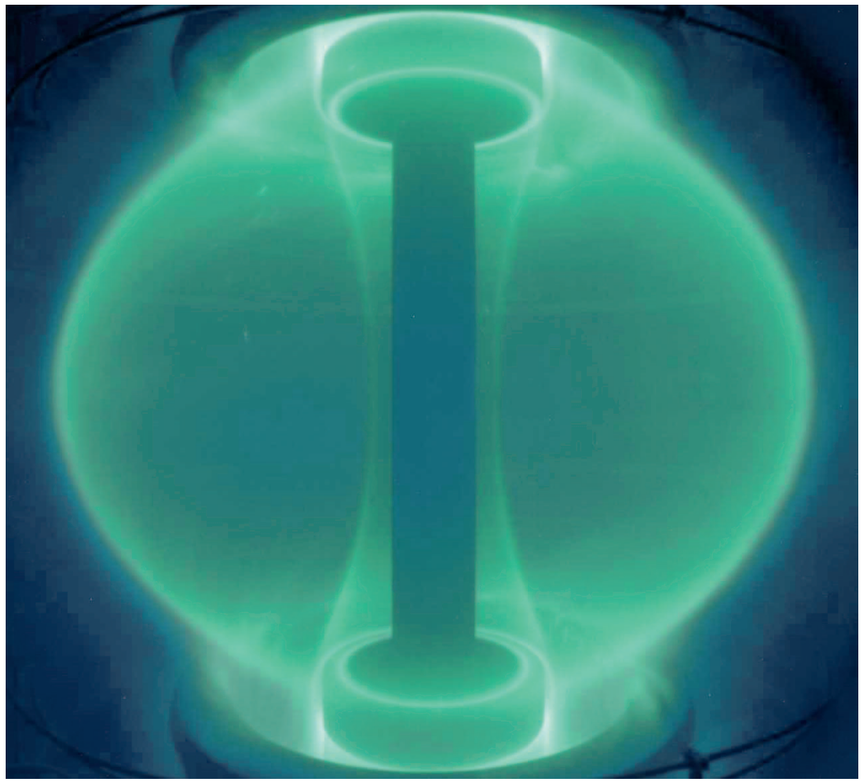
Fusion Plasma Physics

Second, Revised and Enlarged Edition



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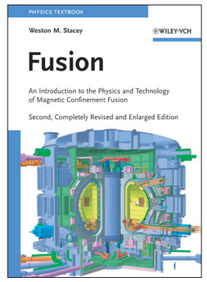

Weston M. Stacey
Fusion
An Introduction to the Physics and Technology of Magnetic Confinement Fusion
Second, Completely Revised and Enlarged Edition
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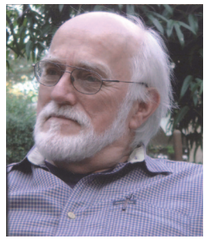
This revised and enlarged second edition of the popular textbook and reference contains comprehensive treatments of both the established foundations of magnetic fusion plasma physics and of the newly developing areas of active research. It concludes with a look ahead to fusion power reactors of the future. The well-established topics of fusion plasma physics are fully developed from first principles through to the computational models employed in modern plasma physics.

The new and emerging topics of fusion plasma physics research – fluctuation-driven plasma transport and gyrokinetic/gyrofluid computational methodology, the physics of the divertor, neutral atom recycling and transport, impurity ion transport, the physics of the plasma edge (diffusive and non-diffusive transport, MARFEs, ELMs, the L-H transition, thermal-radiative instabilities, shear suppression of transport, velocity spin-up), etc. – are comprehensively developed and related to the experimental evidence. Operational limits on the performance of future fusion reactors are developed from plasma physics and engineering constraints, and conceptual designs of future fusion power reactors are discussed.

From the contents:

- Basic Physics
- Motion of Charged Particles
- Magnetic Confinement
- Kinetic Theory
- Fluid Theory
- Plasma Equilibria
- Waves
- Instabilities
- Neoclassical Transport
- Plasma Rotation
- Turbulent Transport
- Heating and Current Drive
- Plasma-Material Interactions
- Divertors
- Plasma Edge
- Neutral Particle Transport
- Power Balance
- Operational Limits
- Fusion Reactors and Neutron Sources



Weston M. Stacey *is Callaway Regents' Professor of Nuclear Engineering at the Georgia Institute of Technology. His career spans almost 50 years of research and teaching in nuclear reactor physics, fusion plasma physics and fusion and fission reactor conceptual design. He led the IAEA INTOR Workshop (1979-88) that led to the present ITER project, for which he was awarded the US Department of Energy Distinguished Associate Award and two Department of Energy Certificates of Appreciation. Professor Stacey is a Fellow of the American Nuclear Society and of the American Physical Society. He is the recipient of several prizes, among them the American Nuclear Society Seaborg Medal for Nuclear Research and the Wigner Reactor Physicist Award, and he is the author of eight previous books and numerous research papers.*

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