

## Prof. Ian H. Hutchinson

### Professor of Nuclear Science and Engineering, MIT.

B.A. (Natural Sciences: Physics), Cambridge University (1972)

Ph.D. (Engineering Physics), Australian National University (1976)

Ian H. Hutchinson is Professor Emeritus of Nuclear Science and Engineering at the Massachusetts Institute of Technology. His primary research interest is plasma physics, especially the magnetic confinement of plasmas (ionized gases): seeking to enable fusion reactions, the energy source of the stars, to be used for practical energy production. He and his MIT team designed, built and operated the Alcator C-Mod tokamak confinement device, an international experimental facility whose plasma temperatures reached beyond 50 million degrees Celsius, and are prototypical of a future fusion reactor.

His doctoral studies, as a Commonwealth Scholar at the Australian National University, involved experiments on one of the earliest tokamaks to operate outside the Soviet Union. After ground-breaking research (1976-9) on MIT's earliest major tokamak experiment, he experimented on a different confinement configuration, the Reversed Field Pinch, at the U.K. Atomic Energy Authority, where he made landmark measurements of the structure of magnetic turbulence showing that it could explain the energy transport. He returned to MIT in 1983 as a member of the Nuclear Engineering department faculty. He directed the Alcator project from 1987 to 2003, and served as Head of the MIT Department of Nuclear Science and Engineering from 2003 to 2009.

His personal scientific contributions span many areas of plasma physics, including the first direct measurement of anomalous resistivity during MHD disruptions and of hollow current profiles during current rise, the first observations of polarized tokamak electron cyclotron radiation and development of diagnostics of thermal and nonthermal electron distributions based on it, fundamental theory of Mach probes to measure plasma flow, comprehensive computational and analytic studies of the interaction of flowing plasmas with embedded objects, and the theory of electron holes.

In addition to 250 journal articles on a variety of plasma phenomena, Dr. Hutchinson is widely known for his standard textbook on measuring plasmas: *Principles of Plasma Diagnostics* (2002), and *A Student's Guide to Numerical Methods* (2015), both published by Cambridge University Press. He has served on numerous national fusion review panels, and on the editorial board of *Physics of Fluids B*, *Physical Review E*, and the *New Journal of Physics*. He was editor in chief of the journal *Plasma Physics and Controlled Fusion* (2000-4). He was the 2008 Chairman of the Division of Plasma Physics of the American Physical Society. He is a fellow of the American Physical Society and of the Institute of Physics. He received the 2022 Ronald C Davidson award for plasma physics of the American Institute of Physics.

Hutchinson is also the author of the computer program TtH a TeX to HTML translator, widely used for web-publishing of mathematics. He has written and lectured extensively on the relationship between science and the Christian faith, and authored the books *Monopolizing Knowledge: A scientist refutes religion-denying reason-destroying scientism* (2011) and *Can a scientist believe in miracles?* (2018). He is an enthusiastic fly-fisherman, squash player, and choral singer.