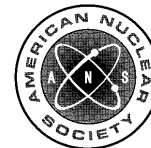


COMMENTS



In this issue, we are pleased to bring you the contributions from the Alcator C-Mod tokamak, located at the Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts. We have been working with international tokamak groups to contribute to series of special issues to recognize and highlight the science and technology contributions to a next-step burning plasma device (ITER). Many groups around the world have been participating, and when completed, these series will have a long-lasting value to the fusion community, from desktops to classrooms. With the recent signing of the agreement to construct ITER at Cadarache, France, this series of special issues is more

timely than ever and will serve to help attract and educate a new generation of scientists and engineers, who will be the ones to design, build, run, and scientifically exploit ITER—reaping the benefits of all that has been achieved in the international fusion program.

We are deeply indebted to the Alcator C-Mod Team and to the contributing authors for their efforts in preparing this special issue for the readers of *Fusion Science and Technology* (*FS&T*). Our thanks are due Dr. John Rice for his help with the coordination of the issue and for serving as the guest editor. The 15 papers included in this issue survived the rigors of the peer review process, courtesy of 40 international reviewers. These papers are either original contributions or informative reviews of the physics and technology results obtained on the Alcator C-Mod tokamak. We extend our utmost gratitude and appreciation to the authors for their hard work, to the reviewers for their guidance, and to the guest editor for his coordination and interface with the authors. An undertaking of this magnitude does not just happen.

The Alcator C-Mod issue is the seventh in the *FS&T* special issue series of tokamak fusion experiments. The first six in the series are as follow:

- “Special Issue on JT-60,” *FS&T*, Vol. 42, No. 2/3, September/November 2002
- “Special Issue on ASDEX Upgrade,” *FS&T*, Vol. 44, No. 3, November 2003
- “Special Issue on Frascati Tokamak Upgrade (FTU),” *FS&T*, Vol. 45, No. 3, May 2004
- “Special Issue on TEXTOR,” *FS&T*, Vol. 47, No. 2, February 2005
- “Special Issue on DIII-D Tokamak,” *FS&T*, Vol. 48, No. 2, October 2005
- “Special Issue on JFT-2M Tokamak,” *FS&T*, Vol. 49, No. 2, February 2006.

The next in this series will focus on the Joint European Torus (JET). We look forward to bringing you the JET special issue and other future specials from around the world.

Alcator C-Mod (in operation since 1993) and its predecessors, Alcator A (1975–1982) and Alcator C (1982–1988) have been built to explore the physics of plasmas in a compact, high field device. The word Alcator is an acronym derived from the Italian words *Alto Campo Torus*, meaning high field torus, and the magnetic fields produced in Alcator tokamaks are among the highest ever achieved in the world. Alcator’s high confining fields let researchers experiment with plasmas hotter and denser than those in tokamaks of similar size. The Alcator C was the first device to

produce the density (n) and confinement (τ) parameters of hot plasma ($n\tau$ —the “Lawson criterion”) necessary for a useful (equivalent deuterium-tritium) fusion reaction.

During its many years of operation, the Alcator C-Mod has been carrying out a number of innovative research techniques and technologies that are important for burning plasmas (ITER). Some of this research includes plasma boundary and surface physics, divertor physics, plasma confinement, plasma control, plasma disruptions and fast particle modes, radio-frequency (ion cyclotron and lower hybrid) heating and current drive, advanced tokamak studies, and accompanying diagnostics that kept the C-Mod program in the forefront of world fusion research. Alcator C-Mod also provides unparalleled hands-on experience for graduate students to conduct thesis research work and to learn how to operate and carry out experiments on a world-class tokamak.

The breadth and depth of the Alcator C-Mod research program and its contributions to ITER are clearly evident in the papers contained in this issue. We wish the team members all continued success and look forward to their future contributions.

This special issue is dedicated to the outstanding team of scientists, engineers, educators, students, technicians, administrators, and support staff that contributed to the success of the Alcator C-Mod program.

Nermin A. Uckan