

# “Recent Plasma Advances and Pathway to High Density Steady State Fusion Reactor by Large Helical Device”

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**TUESDAY, NOVEMBER 28, 2006**

**Faculty Center, Sequoia Room**

**4:00 – 5:15 p.m.**

*(Refreshments at 4:00 p.m., Seminar at 4:15 p.m.)*

**The seminar will be followed by a reception at 5:30 p.m. in the Sierra Room**

Professor O. Motojima is a world leader in plasma science, fusion research and science education. He successfully led the construction and operation of the Large Helical Device (LHD) in Japan, the world's largest superconducting heliotron device. Prof. Motojima is currently the Director-General of the National Institute for Fusion Science (NIFS), a Center of Excellence for fusion research, and plays a key role in coordinating research at Japanese universities.

Prof. Motojima's seminar will start by providing a brief overview of the status of the world's fusion projects and plasma and fusion research at NIFS. The current status of the LHD project is presented, with a focus on the experimental program and recent achievements in plasma performance parameters and steady state. Remarkable progress includes the achievement of a temperature of 140 million degrees, the highest density of 500 trillion/cc with the internal density barrier (IDB), and the highest steady average beta of 4.5% in helical plasma devices, and the largest input energy of 1.6 GJ in all magnetic confinement fusion devices. At the frontier of fusion research, important milestones have recently been met toward a true prototype fusion reactor. Research into harnessing turbulent burning plasmas and thereby controlling fusion reaction, remains one of the grand challenges of complex systems in science. Recent results allow proceeding with a practical reactor design, FFHR (Force Free Helical Reactor). FFHR is based on the current-less steady state reactor concept. The viability of FFHR and engineering issues will be introduced.

Finally, perspective will be given on the ITER Broad Approach program as an integrated part of ITER. Also, the relationship with NIFS' new parent organization, the National Institutes of Natural Sciences, and with foreign research institutions will briefly be explained.

**The seminar is sponsored by the Henry Samueli School of Engineering,  
Plasma Science Institute, and Center for Energy (CESTAR)**

For more seminar details, please contact Ms. Allyson Kwan at [allyson@fusion.ucla.edu](mailto:allyson@fusion.ucla.edu) (310-825-2389)