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Energy Science and Civilization

The supply of energy has been one of the fundamental issues for human beings. In the last two centuries, the recognition has been more and more widely shared that the development of modern science, the expansion of realm of human activities, and the impacts on global environment are tightly coupled, and that this entanglement demands an urgent solution.

On this occasion, the mutual interaction between the energy, science and civilization is reviewed. Aspects of ‘energy science’ are illustrated from the viewpoint of modern physics. The motivation from the energy supply and consumption (driven by the development of human life and civilization) and the efforts to identify the physics of the law of nature are revisited.

Taking an example from plasma physics, the research by NIFS staff and collaborators, the unification of improving our recognition of nature (pure physics) and the generation of new energy source (fusion R&D) is illustrated. As a futurology, some prospect is given including an application of physics of nonequilibrium matter to energy science.

CV

1980 - 1985: Research Scientist at the Japan Atomic Energy Research Institute

1985 - 1989: Associate Professor of Kyoto University

1989 - 1995: Associate Professor of the National Institute for Fusion Science

1995 - present: Professor of the National Institute for Fusion Science

2006 - present: Fellow of the National Institute for Fusion Science

1995 - 2001: Member of Fachbeirat, Max-Planck-Institut für Plasmaphysik (Germany)

2006 - present: Associate member of the Science Council of Japan

2007-2010: Member of the Science and Technology Advisory Committee of ITER