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International Prospective of Plasma Astrophysics Research

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Plasma astrophysics, including space and solar plasma physics, is a discipline that is rapidly growing in scientific opportunity. This scientific fertility arises from the maturation of plasma theory, computation, and experimental techniques, combined with the surge in observational data. The practice of plasma astrophysics consists of diverse components: analytic theory, fluid and kinetic computation, observations from electron diffusion scales in Earth's magnetosphere to cosmological scales in clusters, magnetized basic plasma experiments, high energy density experiments, liquid metal experiments, and aspects of fusion experiments. To facilitate the unity of the field and to explore new scientific opportunities, a Workshop on Opportunity in Plasma Astrophysics (WOPA, <http://www.pppl.gov/conferences/2010/WOPA/>) was recently held in the US and a conference report is being generated. In Asia, symposiums and schools on plasma physics and plasma astrophysics have been organized to promote the collaborations in these fields. In European countries, plasma astrophysics and its application to solar/stellar/accretion disks and jets are one of the key projects in institutes and research/training networks. This talk is to discuss this activity by summarizing key challenges and opportunities in the field of plasma astrophysics.

Keywords: Plasma astrophysics