Publ. Astron. Obs. Belgrade No. 61 (1998), 39 *Invited lecture*

SELF-ORGANIZATION PROCESSES IN PLASMAS

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A large amount of effort put into studies of complexity and self-organization in plasmas has revealed a profound underlying structure in diverse and seemingly irregular phenomena. Self-organization is a generic process of a creation of order in a nonlinear far-from-equilibrium system, open to an environment. Energy input, nonlinear instability which leads to dissipation, entropy production and its removal from a system are key governing points (Sato *et al.* 1996). We shall briefly discuss basic concepts to focus at an example of a stimulated Raman backscattering in laser plasmas. At high intensities, anomalous Raman backscattering, turbulent spectra and hot electrons, detrimental to laser fusion are often observed. We introduce a fluid-hybrid and particle simulations in order to model and explain nonlinear Raman complexities.In a broader context, we study long-time saturated Raman states to find a consistency with a general scenario (Sato *et al.* 1996). An interplay between self-organization at micro (kinetic) and macro (wave- fluid) scales is revealed through quasi-periodic and intermittent evolution of physical variables,related dissipative structures and entropy changes (Škorić *et al.* 1998).

References

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* visiting professor, Ministry of Education, Science and Culture of Japan; partial support by the Ministry of Science and Technology of the Republic of Serbia; under project 01E11 is acknowledged