permit, at least, a qualitative understanding.

In conclusion let us discuss some aspects of the future development of synergetics. It is very young discipline and an enormous amount of work is still ahead of us. Besides a systematic search for further instabilities and instability hierarchies, mathematical methods dealing with, for example, stochastic nonlinear partial differential equations must be further developed. While such equations may describe macroscopic patterns, they may simultaneously represent continuously distributed logical elements. In this way, new insights into the relation between micro- and macrosystems can be expected. Possibly, also new insights into morphogenesis can be gained. The considerations discussed above suggest that nature might use very clever tricks to exploit instabilities by steering the competition of order parameters by means of small parameters stemming from a lower morphogenetic level (for instance genoms). Here and elsewhere a very profound question will presumably show up again and again : to what depth will the human brain be able to unearth the right "order parameters" ?

Bibliography

HAKEN H. ed., *Synergetics - Cooperative Phenomena in multicoponent systems* (Teubner, Stuttgart) 1973. Proceeding of a Conference on Synergetics, 1972.

HAKEN, H., "Cooperative Phenomena in Systems far from Thermal Equilibrium and in Nonphysical Systems" *Rev. Mod Phys.* **47** (1975), No. 1 67.

HAKEN, H., *Introduction to Synergetics - Nonequilibrium Phase Transitions and Selforganization* (Springer, 1976, in the press).

These books countain many references.

Conference Reports

Computing in Plasma Physics and Astrophysics

The 2nd. European Conference on Computational Physics, organized by the Computational Physics Group of EPS, took place on April 27-30, at the Max-Planck-Institut für Plasmaphysic, Garching, FRG. It had become apparent since the 1st. Conference in April 72 that a meeting on computational physics would be particularly interesting if restricted to a small number of fields in physics where similar numerical models are used and similar numerical problems arise. For several reasons a natural choice for this 2nd. Conference was the combination of plasma physics and astrophysics.

The scientific programme included about 50 contributions spread over eight plenary sessions and one session for the presentation of papers which arrived after the deadline. In addition, there were ten survey talks, essentially one introducing each session. The main topics were stellar evolution and pulsars, particle simulation, MHD equilibrium, stability and nonlinear dynamics, transport in stars and laboratory plasmas; computational physics and numerical analysis provided the formal link between the two fields of plasma physics and astrophysics. Plasma physics had a somewhat larger share, as had been anticipated, because the computational efforts in fusion oriented plasma physics are particularly strong at the moment. Nevertheless a reasonable balance between the two fields was reached in the conference programme.

MHD computations have reached a high degree of sophistication and play an important role in the study of fusion plasmas as well as astrophysical plasmas. Powerful methods have been developed to compute MHD equilibria in two dimensions and to investigate their (linear) stability. First results on the problem of general (3-dimensional) equilibria were presented. Multidimensional MHD motions are being computed in various approximations, including different transport effects. The relativistic MHD models for pulsar magnetospheres have been refined, as well as the essentially hydrostatic models for protostar and stellar evolution. Numerical computations of astrophysical convection have produced very interesting results, although the range of Rayleigh and Prandtl numbers accessible to computation is still somewhat limited. Transport codes for laboratory plasmas, especially in Tokamaks, are constantly being refined and updated to take account of increasing observational material; new important processes such as neutral injection are incorporated. Particle simulation of quasicollisionless plasmas has been extended a) to 3-dimensional fully electromagnetic and relativistic descriptions, b) to model self-consistent non-radiating magnetic effects, c) to describe low-frequency instabilities. In the field of computational physics, more accurate treatment of convective terms and the advantages of finite element methods in hydrodynamics have attracted particular interest.

The general impression was that the conference was successful from its conception as well as its actual scientific programme. Only one comment was made that, also in the topical sessions of plasma physics or astrophysics, the purely numerical aspects could have been emphasized more strongly.

The Board of the Computational Physics Group convening immediately after the meeting agreed to continue the series of CPG organized conferences on computational physics every two years, covering a different field of physics (or combination of two fields) each time. Several possibilities for the next Conference have been proposed and a decision will be taken this autumn.

D. Biskamp