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Taming the Whims of Chaos

One of the immanent characteristics of our world is the ceaseless struggle between harmony and chaos, order and disorder, playing out on almost all levels of human experience: from micro-scale phenomena like the chaotic Brownian motion, all the way up to gigantic phenomena on the astronomical scale. As an example of the latter, astro- and geophysicists have for years been trying to grasp and learn to predict the behavior of the solar wind (p. 16). Its fluctuations have a great impact on the Earth's atmosphere and even on processes down here on its surface.

*Through the ages, the wider harmony of the cosmos has inspired not just physicists, but also poets, painters, and musicians. The music of church organs, in particular, has enjoyed a special status, perceived as a reflection of cosmic harmony and God's laws. (See: **Music of the Spheres**, on p. 28).*

Smoothly switching between chaos to order and vice versa is something typical of the processes seen in living organisms. The process whereby well-organized, increasingly complex organisms emerge from the surrounding chaos – known as evolution, of course – is fascinatingly described on p. 24 by outstanding experts in the field of how species diversity arises.

*There are other interesting "order-imposing" natural phenomena to be observed on a somewhat smaller timeframe and local scale. The behavior of marine invertebrates, for example, is fascinatingly orchestrated by chemical signals they receive from their environs, as described in **Sensing a Meal** on p. 12.*

*Moreover, there are certain social domains where the proper proportion of order and chaos remains an issue of prime importance – politics being an excellent example here. Are consensus and harmony always ideals to be sought by those in power? This issue is considered by the preeminent historian Prof. Janusz Tazbir in **Politics and Harmony** (p. 4).*

*Our recognition and quantitative characterization of real-world phenomena will never be complete unless we account for the great role played by **randomness**. The random element inherent in events and phenomena has troubled mankind since the earliest times; its hidden essence has drawn interest from philosophy and the methodology of science, whereas its intrinsic regularities have been brought to light by mathematics and empirical sciences. And so, for a look at the problems of order and chaos from the mathematical standpoint, take a look at p. 9, as well as at the mysterious and unstable "chaotic" order depicted on this issue's cover.*

ACADEMIA staff



Jan Strelau

Breathtaking clouds, instilling awe at the order of the universe, themselves stem from chaotic phenomena