SOME QUESTIONS IN TOPOLOGY
THE TOPOLOGIST'S VIEW AT THE UNIVERSE

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In this presentation we will concentrate onto three different areas of research. The first area is represented by the article *Introduction to the mutual compactificability.* In this article we study a symmetrical analogue of a partially separated (in some sense) compactification of a θ-regular topological space. By „symmetrical analogue" we mean that we do not require density of the original topological space in its extension, and the growth of the space in this extension and the space play a symmetrically equivalent role.

More precisely, the space X is said to be *compactificable* by the space Y or, in other words, X, Y are called *mutually compactificable* if there exists a compact topology τ_K on $K = X \cup Y$ such that the topologies on X, Y induced by τ_K coincide with τ_X, τ_Y respectively, and the sets X, Y are point-wise separated in (K, τ_K). Then we say that the topology τ_K is $\mathcal{C}$-acceptable.

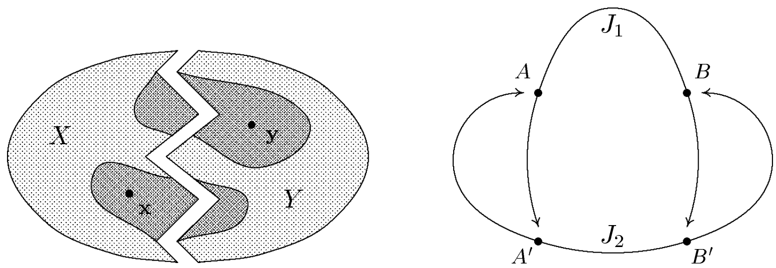

Figure 1.

The situation is illustrated by the figure, from which we may easily see that, for instance, two real intervals are mutually compactificable by a proper embedding into the (real) plane.

Now, let **Top** be the class of all topological spaces. For any pair of two spaces X, Z, we define $X \sim Z$ if for every non-empty space Y disjoint from X, Z the space X is compactificable by Y if and only if Z is compactificable by Y. It can be easily seen that $\sim$ is reflexive, symmetric, transitive and hence it is an equivalence relation. Let us denote by $\mathcal{C}(X)$ the equivalence subclass of **Top** with respect to $\sim$ containing X and call it the *compactificability class* of X.

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Generally speaking, we are interested in the behavior of these classes. The presented paper *Introduction to the mutual compactificability* contains some selected, but mostly preliminary results from a much larger theory which now consists from a series of four and much longer papers (together up to 60 pages), which currently are to be published in the International Journal of Mathematics and Mathematical Sciences.

The second area of research is represented by a joint paper *A note on G_δ-sets and associated low separation axioms* of myself and two my colleagues, Miguel Caldas (from Brasil) and Saeid Jafari (from Denmark). The paper concerns to some relationships between the properties of G_δ sets and some low and relatively general separation axioms, potentially useful in computer science motivated topology. The paper, however, probably still is not in its final form and it may need some polish and improvements before publishing in some prestigious mathematical journal. All comments and suggestions are warmly welcomed.

The third area will be a subject of my oral communication and it may be interesting not only for topologists, but, as I believe, also for some wider community of mathematicians, computer scientists and physicists. It concerns to the point of view at the world which probably exists around us, and the possibility of its approximation by a model, which arise from finite observations and as a limit of these observations. This is realistic, because during all our human history, or during our personal lives, we are able to do only finitely many observations and physical experiments. Everything which is above that, is an extrapolation. In this presentation we will connect general topology with the approach already known in formal concept analysis (in the sense of Ganter and Wille) and as an illustration, we borrow some virtual experiments from quantum physics. And, behind all these considerations, there is a (for me rather fascinating) question:

May the physical phenomena affect the (naturally observed) topology of the universe?

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