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JAN PELANT
(18.2.1950–11.4.2005)

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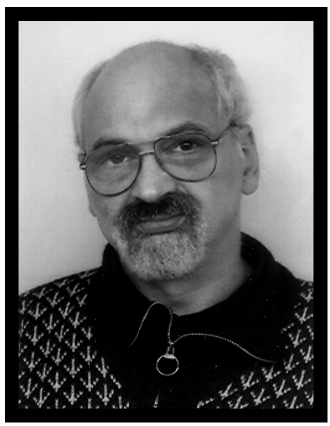
Dr. Jan Pelant, an outstanding Czech mathematician, died on April 11, 2005.



Jan Pelant was born on February 18, 1950 in Prague. He studied mathematics at the Charles University where he graduated with honours in 1973 and later obtained the degree of RNDr. in general topology. Then he became a doctoral student of Miroslav Hušek. He received his CSc. degree (equivalent to PhD) in 1976. During his postgraduate study, he was strongly influenced by Zdeněk Frolík. He enthusiastically participated in Frolík's seminars on uniform spaces and on measure theory. He joined the Mathematical Institute of the Czechoslovak Academy of Sciences in 1976, where he worked for the rest of his life. In 1998 he defended his thesis for the degree of DrSc. (Doctor of Sciences).

His scientific interests included general topology, functional analysis and combinatorics. He published 90 research papers and was a coauthor of a successful mono-

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graph Functional Analysis and Infinite-Dimensional Geometry which was published by Springer Verlag in 2001. He also contributed to books Recent Progress in General Topology II (North-Holland 2002) and Encyclopedia of General Topology (Elsevier 2004).

Jan Pelant obtained his first results in combinatorics and graph theory, especially in algebraic combinatorics and the theory of tournaments. Later on, his main interest shifted to topology and functional analysis but even in these fields he often used combinatorial methods.

Jan's contribution to general topology had a very broad range, but the following four areas of general topology were the major ones: uniform spaces, compact spaces, spaces of continuous functions and hyperspaces.

There was a single text on uniform spaces, J. R. Isbell's classical monograph, at the time when Jan Pelant started his research. Ten years later, Jan solved almost all Isbell's open problems from the book.

The main tool introduced by him was the use of well-founded trees. That offerred a fruitful insight into the structure of uniform covers. Jan Pelant proved among other that locally fine uniform spaces coincide with subfine ones [36]. The technique of well-founded trees yielded also the following addition to Dugundji extension theorem [39]: Let X_i $(i \in I)$ be a family of metric spaces. Equip the product $\prod\limits_{i\in I} X_i$ by the Tychonoff topology τ and by the G_δ-topology ϱ. If $X \subseteq \prod\limits_{i\in I} X_i$ is ϱ-dense in its τ-closure, then every continuous mapping from X into a Banach space continuously extends to the whole product $\prod\limits_{i\in I} X_i$. Recall that a uniformity is of point-finite character, if it has a basis consisting of point-finite covers. Jan Pelant's results [57] say that every $c_0(\Gamma)$ with a metric uniformity is of point-finite character and that every metric uniform space with point-finite character embeds uniformly into $c_0(\Gamma)$, where the size of Γ equals the density of the space in question. Moreover, one cannot ask for Lipschitz embedding in general.

All these results from uniform spaces have a rich area of applications, mainly in the theory of non-linear structure of Banach spaces.

In 1980, a joint paper [27] appeared, where Jan's contribution was substantial. The main result says that the Čech-Stone remainder of a countable discrete space has a tree π-base. This result was a key tool for the calculation of the Baire number of that remainder, and very soon found a wide area of applications both in topology and in set theory.

Let us denote by $C_p(X)$ the space of continuous real-valued functions on a topological space X with a topology of pointwise convergence. The principal results of Jan Pelant in this area include the following:

If $C_p(Y)$ is a linear continuous image of $C_p(X)$, then the complete metrizability of the space X implies the complete metrizability of Y [54]. This was formerly a problem asked by A. V. Arkhangel'skii.

A space X is called σ-relatively metacompact, if every open cover $\mathcal{P}$ of the space X has a refinement $\mathcal{S}$ which is σ-relatively discrete. This name was suggested in [68] as a more informative substitution for the previous "weakly θ-refinable". The paper contains examples of various spaces of functions, which negatively solve problems concerning covering properties of $C_p(X)$ posed by R. Hansell, A. V. Arkhangel'skii and S. P. Gul'ko. As an example, let us mention that the space $C_p(\beta\omega_1 \setminus U(\omega_1))$ is not σ-relatively metacompact. An affirmative statement says that if X is a one-point compactification of a tree, then $C_p(X)$ is hereditarily σ-metacompact. The last statement was used in [60] to answer a question of J. E. Jayne, whether weak topology of a Banach space, which is Radon, must be necessarily σ-fragmentable.

If X is a topological space, let us denote by $\mathcal{F}(X)$ the space of all non-empty closed subsets of X with Vietoris topology, a hyperspace. A continuous selection for closed sets is a continuous mapping $s\colon \mathcal{F}(X) \longrightarrow X$ such that $s(A) \in A$ for every $A \in \mathcal{F}(X)$. The existence of such a selection is a rather strong property: it was known (J. van Mill, E. Wattel) that compact spaces admitting continuous selection have a topology induced by a linear order. R. Engelking, R. W. Heath and E. Michael showed that a zero-dimensional completely metrizable space has a continuous selection for closed sets. Jan Pelant proved the converse implication: If a zero-dimensional metric space admits such a selection, then it is complete [63].

There are other interesting reasonable topologies on the set $\mathcal{F}(X)$. If the topology τ on X is metrizable, then the Vietoris topology on $\mathcal{F}(X)$ is the supremum of all Wijsman topologies, which are determined by metrics which induce τ (G. Beer, A. Lechicki, S. Levi, S. Naimpally). Pelant proved a counterpart to this statement: Under the same assumptions, the infimum of all those Wijsman topologies is a Kuratowski convergence κ, derived from τ [56]. Notice the essential detail: the infimum must be taken in the lattice of all convergences, because Kuratowski convergence is topological if and only if the topology of X is locally compact. If we take the infimum of all those Wijsman topologies in the lattice of all topologies, then we get a topological modification of Kuratowski convergence.

Dr. Pelant's theorems mentioned here constitute a small fragment of his mathematical activities. He had a gift to understand and solve problems and answer questions of other people during a brief conversation. Typically, Jan's contribution was so deep that the starting chat resulted in a respectable joint paper.

Jan Pelant's remarkable results did not remain unnoticed. In 1976, he received the first prize in the competition for young mathematicians from the Czechoslovak Union of Mathematics and Physicists. In 1980 and 1983, he was rewarded by the

Board for Mathematics of the Czechoslovak Academy of Sciences and in 1999, he received Bolzano's medal for merits in mathematics from the Academy of Sciences of the Czech Republic.

Dr. Jan Pelant had scientific contacts with mathematicians all over the world. He repeatedly visited universities in Amsterdam, Torino, Toronto and Helsinki for longer stays and had extensive contacts with mathematicians in Italy, Poland, Netherlands, Canada, Finland and Mexico. His results were so interesting for the topological community and his lectures were always so excellent, that he was an invited main speaker in—up to our knowledge—at least 14 international conferences. He was member of editorial board of two international journals and was one of the main organizers of the traditional Winter Schools in Abstract Analysis and Topology and of the Prague Topological Symposia.

However, Jan Pelant was not just an expert in his own field. He had quite general education and certainly he could have been equally successful in other fields.

He had a remarkable sense of humour. This feature of his personality was obscured not even by his long disease, he was able to make jokes about his health problems till the last moment. In the younger days he used to be the center of any party. For example, he was giving traditional funny talks at Winter Schools. He was also a big star of the mathematical puppet theater "Hobbit" and was even the author of several pieces for this theater and of many verses—all of them full of absurd humour (as many participants of Toposym 1976 may remember).

But the most important that can be said about him—he was a good and fair man. His passing away is an immense loss for his many friends and colleagues and to the whole mathematical community.

List of publications of Jan Pelant

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