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**Report on the scientific achievement presented by Dr. Artur Piękosz
for his habilitation procedure.**

For his habilitation procedure Dr. Artur Piękosz has presented 5 papers, written either by himself or in collaboration, as his major scientific achievement. These papers are mainly in Set Theory, Mathematical Logic and General Topology, though the motivation comes, at least partly, from o-minimal structures, and tame and Grothendieck topologies. Earlier papers of Dr. Piękosz were mainly in the semi-algebraic and o-minimal geometry.

In this report I am not going to describe in detail the content of these 5 papers. That is done in Dr. Piękosz's self-report. I will concentrate mainly on their importance and contribution. Let me first give a few remarks on the earlier papers of Dr. Piękosz in the area of o-minimal structures and semi-algebraic geometry. They are in general descent publications, presenting observations and remarks improving understading well-known theorems. One may wonder why they are so rarely cited. I guess that one of the reasons is that they are not widely known, because of the journals they were published. For instance, Dr. Piękosz's paper with W. Pawłucki entitled "A remark on the Lion-Rolin preparation theorem for LA-functions" containing a correction of a result of J.-M. Lion and J.-P. Rolin, after Mathematical Reviews has not been cited at

all, contrary to the Lion-Rolin paper that has been cited 53 times.

The 5 papers presented for the habilitation procedure contain a few new constructions and results. One of the main one is the systematic study of generalized topological spaces that were introduced by H. Delfs and M. Knebusch in order to handle correctly the spaces that are "locally" semi-algebraic. Seeking sufficiently general but meaningful properties of these spaces, Dr. Piękosz relates them, in particular, to locally small spaces and to bornological universe. In [H.1] paper Dr. Piękosz explains and extends semialgebraic homotopy theory, developed again by Delfs and Knebusch, to an o-minimal homotopy theory. As a corollary he shows that the generalized homology and cohomology theories on pointed weak polytopes uniquely correspond to the known topological generalized homology and cohomology theories on pointed CW-complexes. Some of these papers are published in descent, though not the first rank, journals, *Topology and Appl.*, *Rocky Mountain Math. Journ.*. It is difficult to judge at the moment their impact of this work, because they were virtually not quoted by other mathematicians. It is also to show how these constructions can be applied to establish interesting new properties or results.

Conclusion. The scientific achievements presented by Dr. Artur Piękosz for his habilitation procedure contain some new constructions and results. Nevertheless these contributions seem to be not strong enough and their impact requires still to be confirmed. Therefore, I am not favorable to award to Dr. Artur Piękosz the degree of "doktor habilitowany".

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