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Review of scientific, didactic and organisational achievements of Dr. Slawomir Rams for the conferment of the title of Professor in the field of Mathematics.

The scientific field of the investigations of Dr. Slawomir Rams is Algebraic and Analytical Geometry. More precisely he is more interested in concrete classical problems than abstract theories.

After he obtained the habilitation in 2007, his main contributions have been in the theory of the algebraic projective surfaces and projective threefolds.

A main topic has been the study of the lines on surfaces in the projective space.

This is a very classical topic, studied since the nineteenth century by, among others, Salmon, Clebsch - that showed the famous result about the existence of 27 lines on a smooth cubic - and Schur - that provided an example of a quartic containing 64 lines. We recall that the general surface of degree strictly greater than 3 does not contain any line. In 1943 B. Segre claimed that this number (64) is actually the absolute maximum number of lines for smooth complex quartics.

In a remarkable series of papers, most of them in collaboration with Matthias Schütt, Dr. Slawomir Rams showed, among other things, that:

i) the proof given by Segre is incorrect,
ii) the bound 64 actually holds in characteristic different form 3,
iii) in characteristic 3 it is no longer true,
iv) he also considered the singular case.

We remark that the crucial point was the construction of special lines, called "of second type", that are of inflection in any point of the associated elliptic fibration, a geometry not considered by Segre.

The problem of the lines (structure, configurations, maximal number, etc.) in higher degree and the problem of the Picard numbers of a smooth projective surface was also considered.

Some other investigations are devoted to Enriques and K3 surfaces. He studied the structure of the Zariski decomposition and the entropy of their automorphism group.

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A second line of research, often in collaboration with Prof. Slawomir Cynk, was addressed to the study of threefolds with isolated singularities. Several generalizations of Clemens' defect formula are given and special type of singularities are considered.

We have to add that the previous researches started before the habilitation, namely the configuration of rational curves on surfaces and the defect theory for threefolds together with some contribution to the theory of intersection and to the geometry of some linear series.

The publications of Dr. Slawomir Rams are original, the methodological approach is rigorous, the relevance of the publications is good and sometimes excellent as it is also certified by a consistent number of citations. The analytical determination of the individual contribution of the candidate in collaborative works is deducible from the CV.

Dr. Slawomir Rams has been investigator, principal investigator and now coordinator of NCN founded projects; he has been the supervisor of a PhD thesis defended in 2011 and now he is the supervisor of other students. Other didactic activities are not present in the CV.

He contributed to the dissemination of Mathematics, has been referee of several Journals, and he achieved many prizes and recognitions for his activities.

In summary: The congruence of each publication and of his organisational activities with a University Professor profile appear to be complete; moreover, he has given important contributions to a classical topic and has been the supervisor of a PhD thesis. For these reasons I support for granting the applicant with the title of Professor.

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